Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

January 31, 2024

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

Attention: Jo-Anne Galarneau
Executive Director and Board Secretary

Re: Short-Term Load Forecasting Accuracy Report for 2023

Please find enclosed Newfoundland and Labrador Hydro's annual report on the accuracy of its load forecasting software. The analysis contained within the report encompasses data from January 1 to December 31, 2023.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/sk

Encl.

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
Cheryl G. Blundon
PUB Official Email

Consumer Advocate
Dennis M. Browne, KC, Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Bernice Bailey, Browne Fitzgerald Morgan & Avis

Linde Canada Inc.
Sheryl E. Nisenbaum
Peter Strong

Newfoundland Power Inc.
Dominic J. Foley
Lindsay S.A. Hollett
Regulatory Email

Teck Resources Limited
Shawn Kinsella

Island Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Dean A. Porter, Poole Althouse

Short-Term Load Forecasting Accuracy Island Interconnected System

2023

January 31, 2024

A report to the Board of Commissioners of Public Utilities

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1.0 Load Forecasting

1.1 Load Forecasting Software

On February 23, 2023, Newfoundland and Labrador Hydro ("Hydro") adopted a new load forecasting software for its short-term load forecasting with a period of 14 days. This replaced the previous forecasting software, Nostradamus. The new software uses a combination of regression and neural network models that are trained using a sequence of continuous historic periods of hourly weather and half-hourly demand data. The models then forecast system demand for a 14-day horizon using predictions of weather parameters.

This report will focus on the performance of the new software beginning February 23, 2023.

1.2 Short-Term Load Forecasting

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

1.2.1 Utility Load[1]

Hydro has a contract[2] with WSP Global Inc. ("WSP")[3] to provide the weather parameters in the form of half-hourly weather forecasts that are provided twice daily for the proceeding 14 days. At the same time weather forecast data is provided, WSP also provides recent observed data at the locations used in the forecasts.[4] The actual and forecast data are automatically retrieved from WSP and input to the load forecast database.

The load forecasting software uses a variety of weather parameters for forecasting—provided a sufficient historical record is available for training. Hydro currently uses air temperature, wind speed, and cloud cover. The load forecasting software can use each variable more than once; for example, both the current and forecasted air temperatures are used in forecasting load. Wind chill is calculated within the load forecasting software program using a set formula that requires a wind speed and dry bulb input.

[1] Utility load is the summation of Newfoundland Power Inc. and Hydro Island Rural requirements.
[2] The current contract will expire on April 1, 2024. Hydro is in the process of evaluating proposals for weather services for 2024–2025.
[3] WSP Global Inc. ("WSP") acquired Wood PLC ("Wood") in 2022.
[4] The locations used for the weather forecast data are St. John's, Gander, and Deer Lake.

The load forecasting software uses weather data for St. John's, Gander, and Deer Lake as well as a parameter that indicates daily daylight hours. Training and verification[5] periods are selected to provide a sufficiently long period to ensure that a range of weather parameters are included (e.g., high and low temperatures) but short enough that the historic load is still representative of loads that can be expected in the near future. The load forecasting software was trained twice in 2023, during the months of August and December, to further improve forecasting accuracy. As the load forecasting software has been recently implemented, a full year of performance data is not yet available. Training the load forecasting software model is a process that will be performed once a quarter. The goal is to improve the forecasting accuracy by providing the load forecasting software with updated data and trends of recent loads and weather. This helps ensure that variables such as load growth and extreme weather are properly accounted for when predicting future load requirements.

Demand data for the Island Interconnected System utility load is automatically imported to the load forecasting software each half-hour. Newfoundland Power and Hydro's total utility load (conforming)[6] is input in the model. Industrial load (non-conforming),[7] which is not a function of weather, is added to the forecasts within the software to derive the total load forecast.

The load forecasting software model creates separate sub-models for weekdays, weekends, and holidays during the training process to account for the variation in customer use of electricity. The load forecasting software has separate holiday groups for statutory holidays and for days that are known to have unusual loads, such as the days between Christmas Day and New Year's Day as well as the closure of schools during Easter.

1.2.2 Industrial Load

Industrial loads tend to be almost constant, as industrial processes are independent of weather. Under the current procedure, the Power-on-Order[8] for each Industrial customer plus the expected owned generation from Corner Brook Pulp and Paper Limited are used as the industrial load forecasts.

[5] The load forecasting software will automatically perform verification over a designated historical period upon completion of training. The verification period is used to evaluate the accuracy of the forecast using data on which the model has not trained. This ensures that the model is not memorizing the correct answer.
[6] Conforming load refers to load that changes consistently with the load pattern of an area.
[7] Non-conforming load refers to load that changes abnormally with respect to the load pattern of an area.
[8] Power on Order refers to the firm power Hydro agrees to deliver to a customer and the customer agrees to purchase from Hydro, as set out in a service agreement.

Industrial customer loads can be modified based on knowledge of customer loads; for instance, a temporary decrease in requirements at Braya Renewable Fuels (Newfoundland) GP Inc. is associated with ongoing work related to the conversion of the Come-by-Chance refinery to renewable diesel and sustainable aviation fuel service. The expected load can be modified in any given hour of the 14-day forecast, or the default value can be modified to be used indefinitely.[9]

1.2.3 Supply and Demand Status Reporting

Since December 2014, Hydro has submitted periodic reports on the accuracy of load forecasting.[10,11,12,13,14] The forecast peak as of 7:20 a.m. is reported daily to the Board in Hydro's Supply and Demand Status Reports.[15] The weather forecast for the next 14 days and the observed weather data for the previous day are input into the model at approximately 5:00 a.m. and 2:00 p.m.; the load forecasting software is then run every half-hour of the day. Following completion of the software run, the generated forecast is made available for reference to assist in monitoring and managing both available and spinning reserves. The within-day forecast updates are primarily used to manage operating reserve, particularly in advance of the forecast system peaks.

[9] 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, the forecast load can be modified to provide a more accurate load forecast.
[10] Load forecasting accuracy reports were originally filed in relation to the Board of Commissioners of Public Utilities' ("Board") *Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System* proceeding.
[11] Until 2023, the reporting was based on Hydro's former load forecasting software program, Nostradamus.
[12] As per "Newfoundland and Labrador Hydro – Accuracy of Nostradamus Load Forecasting Reports – Filing Schedule," Board of Commissioners of Public Utilities, January 18, 2018, the Board indicated that the reporting frequency should change to annually commencing November 15, 2018.
[13] In correspondence "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 – Request for Change to Filing Schedule," Newfoundland and Labrador Hydro, October 23, 2018, Hydro requested to change the annual filing date of this report to January 31, which allows the report to cover the previous calendar year.
[14] In "Newfoundland and Labrador Hydro – Accuracy of Nostradamus Load Forecasting Annual Reports – Board's Response to Hydro's Request to Change Filing Date," Board of Commissioners of Public Utilities, November 6, 2018, the Board accepted Hydro's request to change the annual filing date of this report.
[15] Hydro's daily Supply and Demand Status reports can be accessed at <http://www.pub.nf.ca/applications/IslandInterconnectedSystem/DemandStatusReports.php>.

1.3 Potential Sources of Variance

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

- Differences in the export values in the forecast compared to actual exports throughout the day, which can be scheduled one hour in advance. These sources of variances are noted in the Supply and Demand Reports to Board;
- Differences in the industrial load forecast due to unexpected changes in Industrial customer loads. For example, if an Industrial customer were to undertake maintenance that Hydro was unaware of, or increase production to meet customer demand, the actual load would deviate from the scheduled load;
- Inaccuracies in the weather forecast—particularly temperature, wind speed, or cloud cover; and
- Non-uniform customer behaviour, resulting in unpredictability. The impacts of the COVID-19 pandemic on load can be considered non-uniform customer behaviour.

Delivery of the Nova Scotia Block and Supplemental Block continued in 2023.[16,17,18] These scheduled deliveries are included in the forecast peak, as reported by 7:20 a.m. daily. Decisions regarding additional exports over the Maritime Link during peak periods are carefully coordinated and include conservative consideration of Hydro's native load forecast and available supply. The forecast peak does not always account for exports, as exports can be contracted at any time throughout the day. As noted previously, this can result in an error when comparing a peak forecast prepared in the early morning against an actual peak that includes real-time exports.

[16] The first delivery of the Nova Scotia Block occurred in August 2021 and the first delivery of the Supplemental Block occurred in November 2021.
[17] Pursuant to the Energy and Capacity Agreement between Nalcor Energy and Emera Inc. ("Emera"), the Nova Scotia Block is a firm annual commitment of 980 GWh, supplied from the Muskrat Falls Hydroelectric Generating Facility on peak. <https://www.emeranl.com/docs/librariesprovider13/maritime-link-documents/commercial-agreements/amended-and-restated-energy-and-capacity-agreement.pdf?sfvrsn=dec21945_2>.
[18] Physical delivery of the Nova Scotia Block will only occur when the Labrador-Island Link ("LIL") is online and able to transfer power.

2.0 Forecast Accuracy Summary

2.1 Analysis

This report examines the accuracy of the Hydro forecasting process for February 23, 2023 through December 31, 2023.

In Appendix A, Table A-1 to Table A-11 present the daily Island Interconnected System forecast total peak, actual total peak, available Island supply forecast reserve, as well as the error and percent error. The data is also presented in Appendix B, Chart B-1 to Chart B-4.

In Appendix B, Chart B-3 and Chart B-4 plot the total forecast and actual total peaks, as shown in Chart B-1 and Chart B-2, with the addition of a bar chart showing the difference between the two data series in megawatts. In both the tables and charts, a positive error is an overestimate and a negative error is an underestimate. Appendix B, Chart B-3 and Chart B-4 reveal that the forecasting process consistently overestimates the peak of the total load. This is typically a result of an overestimate in industrial load forecast and/or export activity over the Maritime Link that was contracted after the forecast was published.

The total Island Interconnected System peak load, including exports during the period, varied between 665 MW (July 11, 2023) and 1,988 MW (February 27, 2023). The available Island supply varied from 1,180 MW to 2,474 MW. Island Interconnected System reserves were sufficient throughout the period.

In Appendix A, Table A-12 to Table A-22 present error statistics for the utility peak forecast (i.e., the portion of the forecast actually determined by the model). Neither the Industrial forecast nor the Maritime Link export activity is included in the values presented in these tables. In Appendix B, Chart B-5 and Chart B-6 plot the data and error for the utility peak. Examination of the utility forecast provides more insight into the accuracy of the load forecasting software, as changes or error in the industrial forecast and the presence of export activity may increase the perceived error as compared to the total forecast as of 7:20 a.m., making the total forecast appear worse or, at times, better than it is.

2.2 Data Adjustments and Forecast Issues

In analysing the data, there are instances that require adjustments for a variety of reasons. In these instances, the data for affected hours is either replaced using interpolation, or is adjusted by a set value

so that in the future, when the data for this period is used in training, the load forecasting software will use a value not affected by the event.

During 2023, there were various occasions where weather data did not import into the load forecasting software correctly, or weather data was missing from the service provider, WSP. In these instances, the weather data was manually input into the software program based on hourly data from Environment Canada.

On February 4, 2023, a request was made by Hydro to Newfoundland Power to curtail their customers. The actual Island utility load values in the load forecasting software were adjusted upward by 14 MW for these hours. There was also a short-term voltage reduction for Newfoundland Power on this day, resulting in an upward adjustment during that period by 25 MW. As February 4, 2023 was Newfoundland Power's winter peak day, additional adjustments were made to the Island utility load for that day to account for customer outages that occurred during peak hours.

On February 27, 2023, there was a short-term voltage reduction for Newfoundland Power and the actual Island utility load values in the load forecast software were adjusted upward during these hours by 15 MW.

From April 14 to April 23, 2023, work was completed on a SCADA[19] upgrade for Hydro's EMS[20] site. This work resulted in actual load data not being imported into the load forecasting software in a timely manner from April 19 to 21, 2023. Once the update was completed, actual data was imported into the load forecasting software. Additionally there were issues with forecast data accuracy in the EMS, including the Total Island Load forecast. Industrial Customer's Power-on-Order was manually added to calculate the Total Island Load forecast.

On July 12, November 21, and November 22, 2023, the EMS did not record actual data. Values were added for all meters in the load forecasting software to account for this outage using Historian Software[21] data.

[19] Supervisor Control and Data Acquisition ("SCADA").
[20] Energy Management System ("EMS").
[21] Software data Hydro uses to capture real-time and store historical system data.

On December 14, 2023, Newfoundland Power lost approximately 55 MW of load during the overnight period.[22] The load was smoothed during these hours to ensure future load forecasts are not impacted by this event.

2.3 Days of High Error[23]

The bolded dates in Appendix A, Table A-12 To Table A-22 indicate the days of high error[24] in the load forecast. Based on discussions with Board staff on December 19, 2022, Hydro will continue to select days of highest error based on the Utility load (Appendix A, Table A-12 to Table A-22 data) in 2023. The days with the highest error (up to three days per month) are selected for a more detailed analysis. The following are the days with the highest error. Additional information on each is provided in Sections 2.3.1 to 2.3.9.3.

- March 4 and 19, 2023;
- April 7, 16 and 22, 2023;
- May 5, 21 and 22, 2023;
- June 3, 10 and 22, 2023;
- July 4 and 13, 2023;
- September 3, 19, and 28, 2023;
- October 16, 21, and 22, 2023;
- November 6 and 26, 2023; and
- December 19, 20, and 26, 2023.

Each high error day includes a table with peak data summary. The data reported to the Board ("Board Forecast" and "Board Actual") includes utility load, industrial load, and exports. The Island Forecast data includes utility load as well as Industrial customer load.

[22] Approximately 2:00 a.m. to 6:00 a.m.
[23] All plots showing the hourly distribution of the load forecast in comparison to the actual total load do not include Maritime Link export activity to aid in determining other sources of differences between actual and forecast loads.
[24] Hydro considers an error below 4.95% to be within acceptable forecasting limits.

2.3.1 March 2023

In March 2023, the forecast utility peak was 1,559 MW, which is consistent with the actual utility peak of 1,559 MW. Absolute error was 18 MW on average, with an average percent error[25] of -0.1%, an average absolute error[26] of 1.5%, and an average actual/forecast of -0.1%.

2.3.1.1 March 4, 2023

Table 1 provides a summary of forecast peak data for March 4, 2023.

Table 1: Peak Data Summary for March 4, 2023

	Load (MW)	Time	Error (%)[27]	Temperature Delta (°C)[28]	Wind Speed Delta (km/h)[29]
Utility Forecast	1,357	7:00 p.m.	9.3	(2.00)	19
Utility Actual	1,242	8:00 a.m.		0.00	2
Island Forecast	1,520	7:00 p.m.	9.6	(2.00)	19
Island Actual	1,387	8:00 a.m.		0.00	2
Board Forecast	1,690	N/A	N/A	N/A	N/A
Board Actual	1,590				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,690 MW; the actual reported peak was 1,590 MW. Chart 1 to Chart 5 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 1 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 7:00 p.m. peak of 1,520 MW; the actual peak was 1,387 MW[30] and occurred at 8:00 a.m., resulting in an overestimate of 9.6%. The load forecast at the time of peak was 1,425 MW.

[25] Average of all daily errors.
[26] Average of all absolute value daily errors.
[27] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[28] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[29] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.
[30] The actual total peak reported in the daily Supply and Demand Status Reports is based on a five-minute time step; however, the load forecasting software reports on an hourly time step, sometimes resulting in a different peak value.

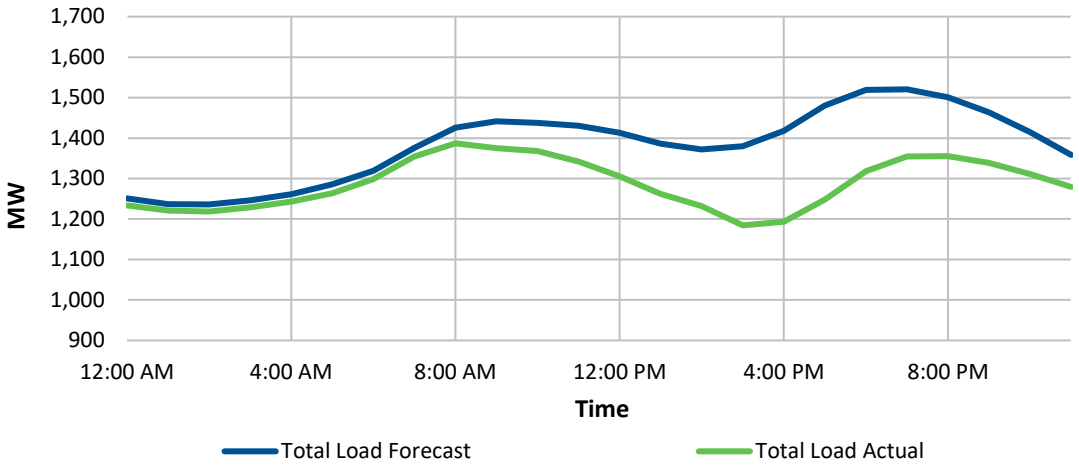

Chart 1: Forecast vs Actual Total Load for March 4, 2023

Chart 2 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 7:00 p.m. of 1,357 MW; the actual peak was 1,242 MW and occurred at 8:00 a.m., resulting in an overestimate of 9.3%. The load forecast at the time of peak was 1,262 MW, resulting in an overestimate of less than 2% at the time of peak.

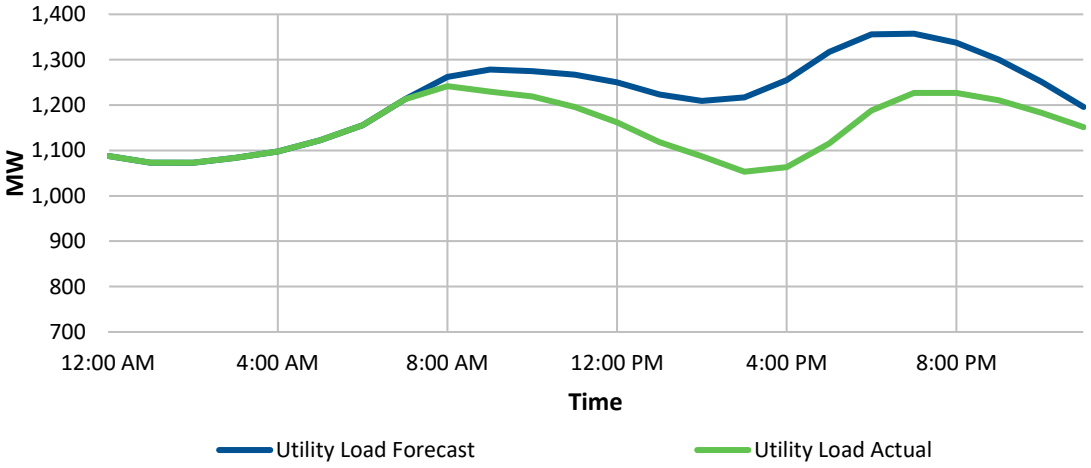

Chart 2: Forecast vs Actual Utility Load for March 4, 2023

Chart 3 shows the actual temperature in St. John's compared to the forecast. From 9:00 a.m. until 9:00 p.m., the temperature was warmer than forecast by 1°C to 3°C. This likely contributed to the forecast error and shifted the peak from the predicted 7:00 p.m. to the actual 8:00 a.m. peak.

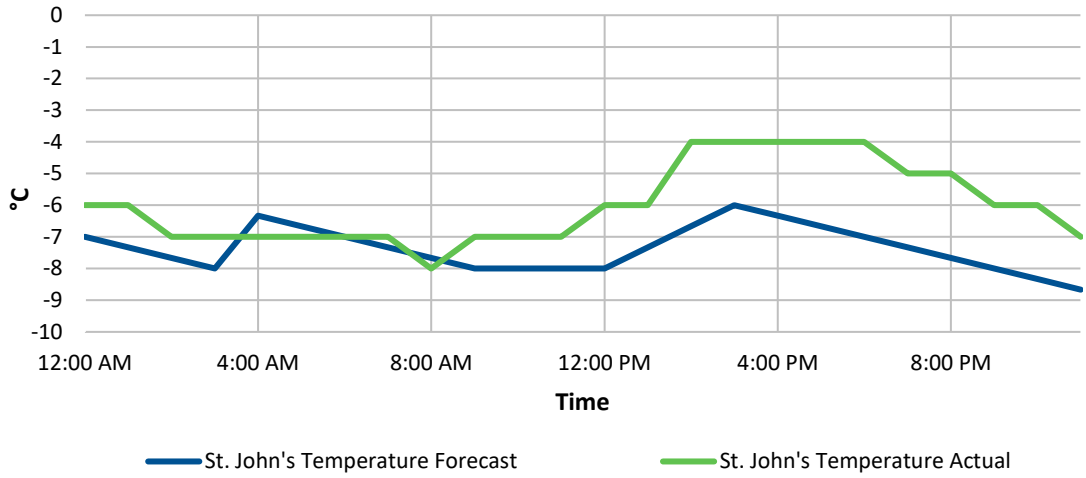

Chart 3: Forecast vs Actual Temperature for March 4, 2023

Chart 4 shows the actual wind speed in St. John's compared to the forecast. The actual wind speed was slightly less than forecast for the majority of the day.

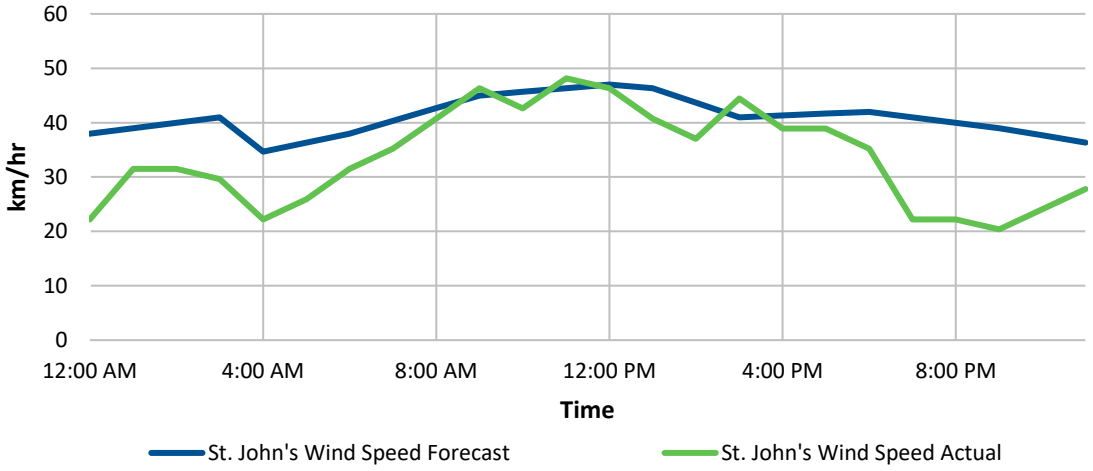

Chart 4: Forecast vs Actual Wind Speed for March 4, 2023

Chart 5 shows the actual cloud cover in St. John's compared to the forecast. It was less cloudy than forecast for the majority of the day.

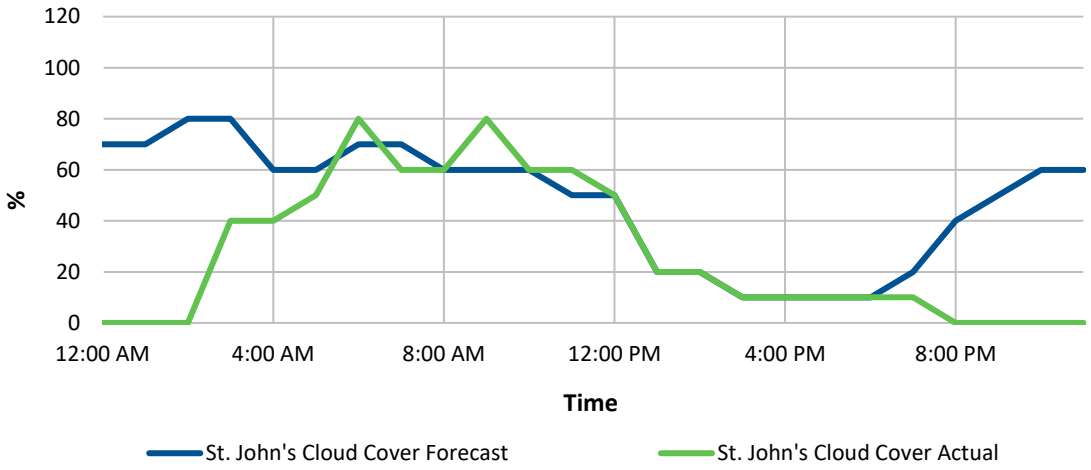

Chart 5: Forecast vs Actual Cloud Cover for March 4, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the weather forecast. An overestimation of the load resulted in more than enough reserve being available.

2.3.1.2 March 19, 2023

Table 2 provides a summary of forecast peak data for March 19, 2023.

Table 2: Peak Data Summary for March 19, 2023

	Load (MW)	Time	Error (%)[31]	Temperature Delta (°C)[32]	Wind Speed Delta (km/h)[33]
Utility Forecast	1,039	8:00 p.m.	-5.2	0.00	0
Utility Actual	1,096	12:00 p.m.		1.00	4
Total Forecast	1,202	8:00 p.m.	-3.4	0.00	0
Total Actual	1,245	12:00 p.m.		1.00	4
Board Forecast	1,480	N/A	N/A	N/A	N/A
Board Actual	1,555				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,480 MW; the actual reported peak was 1,555 MW. Chart 6 to Chart 10 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[31] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[32] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[33] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 6 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted an 8:00 p.m. peak of 1,202 MW; the actual peak was 1,245 MW and occurred at 12:00 p.m., resulting in an underestimate of 3.4%. Load forecast at the time of peak was 1,123 MW.

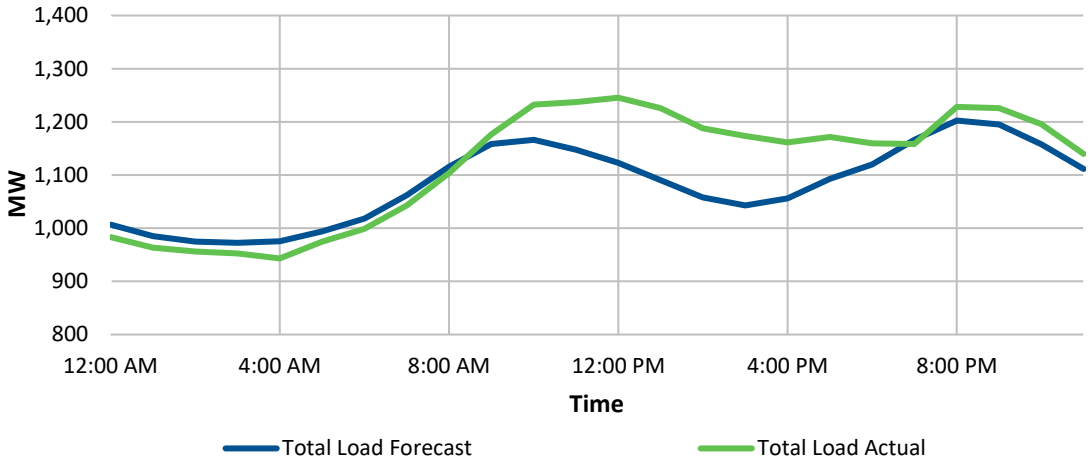

Chart 6: Forecast vs Actual Total Load for March 19, 2023

Chart 7 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 8:00 p.m. of 1,039 MW; the actual peak was 1,096 MW and occurred at 12:00 p.m., resulting in an underestimate of 5.2%. The load forecast at the time of peak was 960 MW.

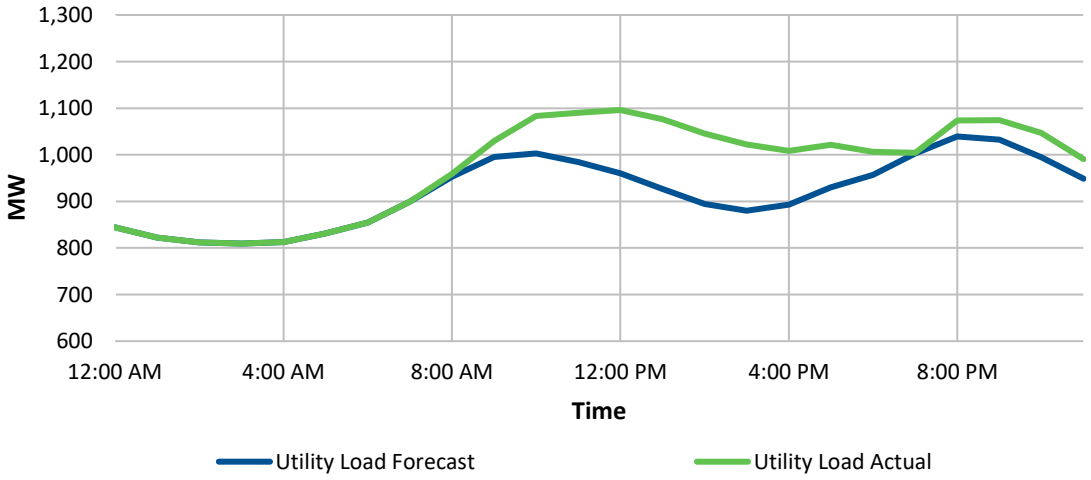

Chart 7: Forecast vs Actual Utility Load for March 19, 2023

Chart 8 shows the actual temperature in St. John's compared to the forecast. From 9:00 a.m. to 9:00 p.m., the temperature was colder than forecast by 1°C to 3°C, which likely contributed to the load forecast error.

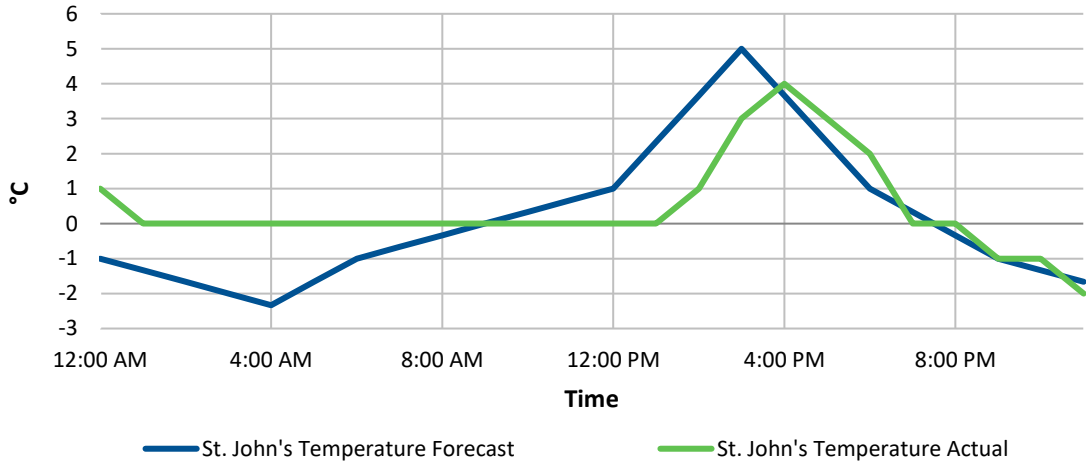

Chart 8: Forecast vs Actual Temperature for March 19, 2023

Chart 9 shows the actual wind speed in St. John's compared to the forecast. For the two hours leading up to peak, the actual wind speed was slightly higher than forecast, which could have contributed to the load forecast error.

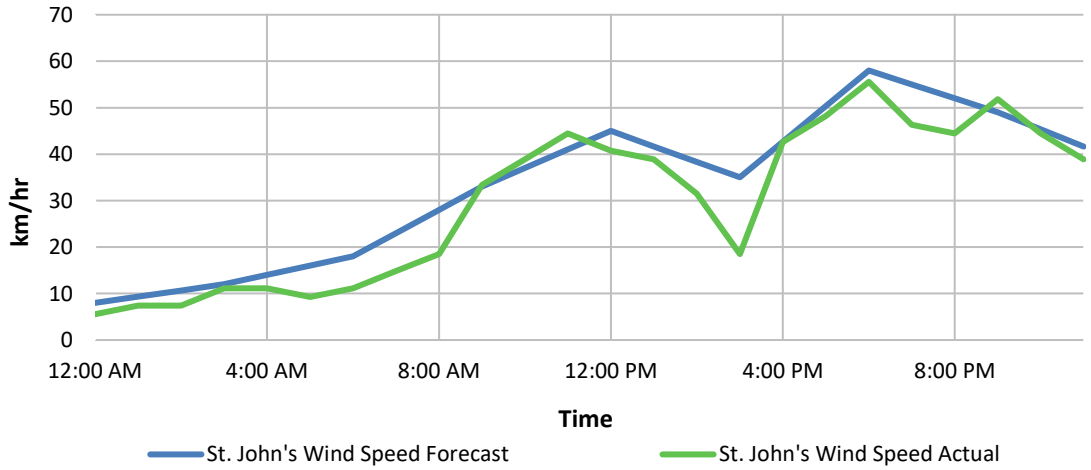

Chart 9: Forecast vs Actual Wind Speed for March 19, 2023

Chart 10 shows the actual cloud cover in St. John's compared to the forecast. It was less cloudy than forecast for the majority of the day.

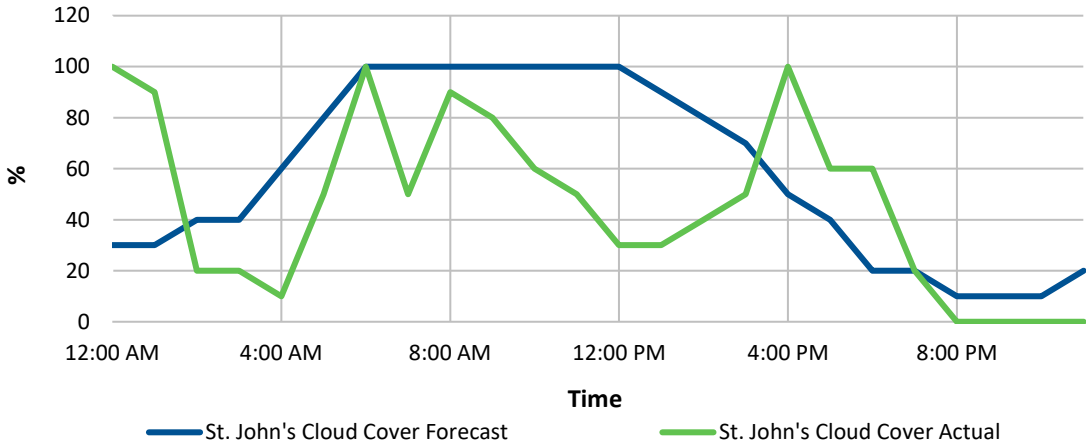

Chart 10: Forecast vs Actual Cloud Cover for March 19, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to discrepancies in the temperature and wind speed forecasts compared to actual weather conditions. Discrepancies may also be attributed to non-uniform customer behaviour as this day was a weekend day, which preceded the St. Patrick's Day holiday on Monday, March 20, 2023.

2.3.2 April 2023

In April 2023, the forecast utility peak was 1,212 MW, which is 2.8% higher than the actual utility peak of 1,179 MW. Absolute error was 25 MW on average, with an average percent error of 0.0%, an average absolute error of 2.4%, and an average actual/forecast of -0.1%.

2.3.2.1 April 7, 2023

Table 3 provides a summary of forecast peak data for April 7, 2023.

Table 3: Peak Data Summary for April 7, 2023

	Load (MW)	Time	Error (%)[34]	Temperature Delta (°C)[35]	Wind Speed Delta (km/h)[36]
Utility Forecast	972	9:00 a.m.	-6.6	0.00	9
Utility Actual	1,042	10:00 a.m.		1.00	12
Total Forecast	1,136	9:00 a.m.	-3.0	0.00	9
Total Actual	1,171	10:00 a.m.		1.00	12
Board Forecast	1,400	N/A	N/A	N/A	N/A
Board Actual	1,441				

[34] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[35] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[36] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,400 MW; the actual reported peak was 1,441 MW. Chart 11 to Chart 15 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 11 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 9:00 a.m. peak of 1,136 MW; the actual peak was 1,171 MW and occurred at 10:00 a.m.; resulting in an underestimate of 3%. The forecast load at the time of peak was 1,131 MW.

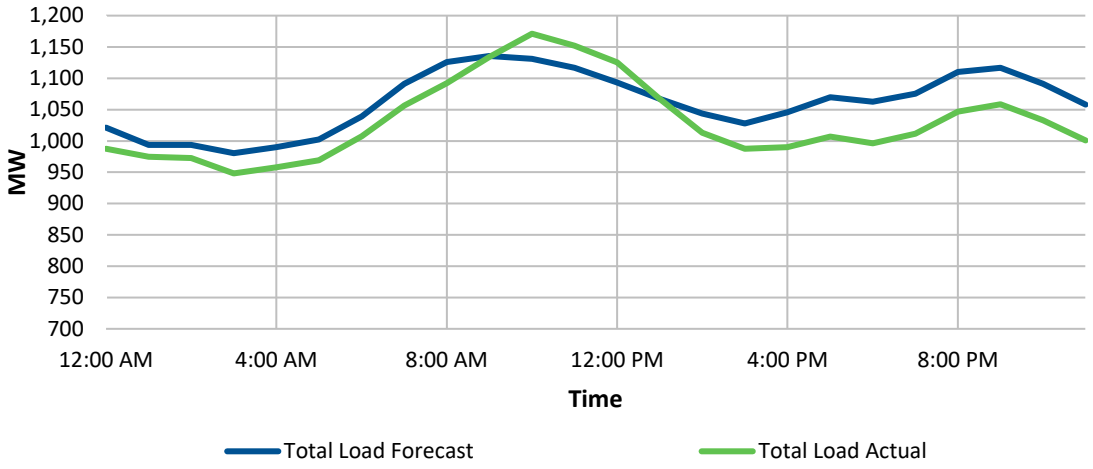

Chart 11: Forecast vs Actual Total Load for April 7, 2023

Chart 12 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 9:00 a.m. of 972 MW; the actual peak was 1,042 MW and occurred at 10:00 a.m.; resulting in an underestimate of 6.6%. The total load forecast at the time of peak was 968 MW.

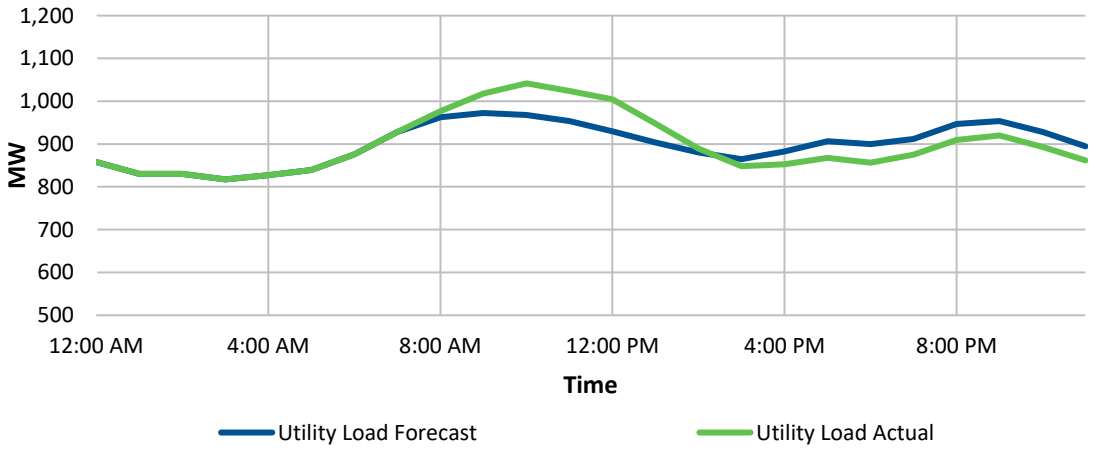

Chart 12: Forecast vs Actual Utility Load for April 7, 2023

Chart 13 shows the actual temperature in St. John's compared to the forecast. The temperature was cooler than forecast by 1°C at peak.

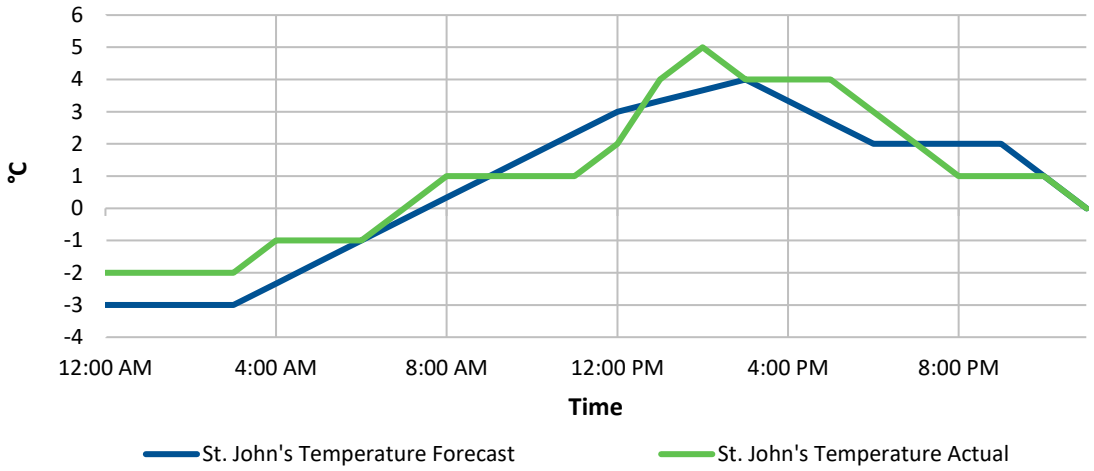

Chart 13: Forecast vs Actual Temperature for April 7, 2023

Chart 14 shows the actual wind speed in St. John's compared to the forecast. The actual wind speed was slightly less than forecast for the majority of the day.

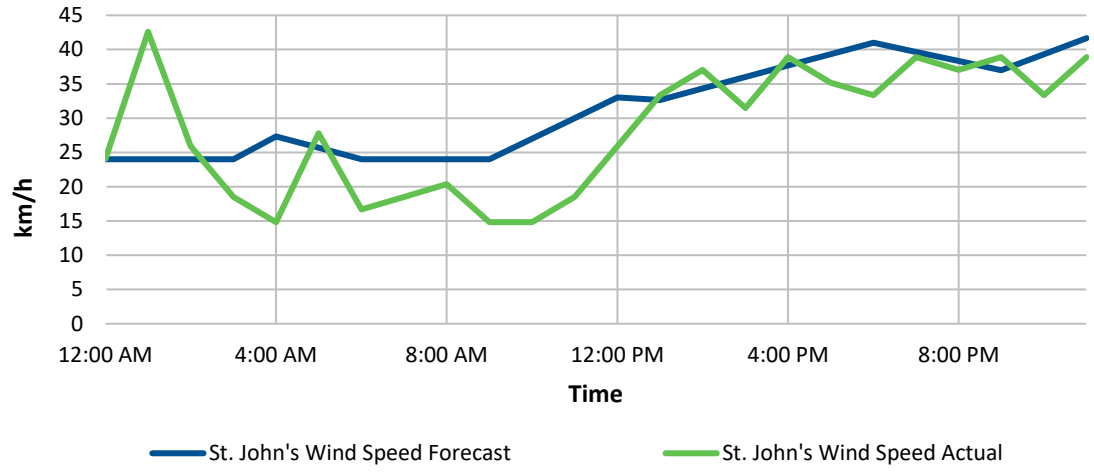

Chart 14: Forecast vs Actual Wind Speed for April 7, 2023

Chart 15 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

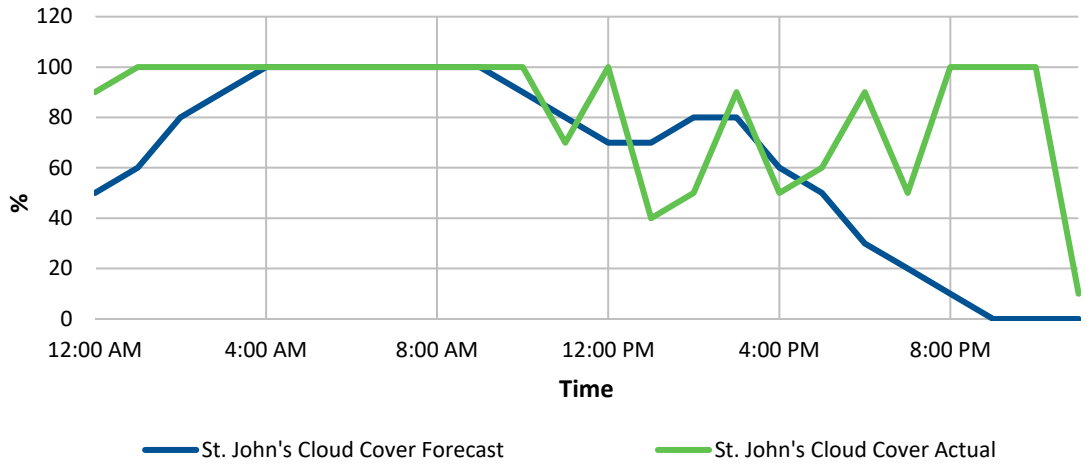

Chart 15: Forecast vs Actual Cloud Cover for April 7, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour, as it was a statutory holiday—Good Friday. In the last six years, four Good Fridays have been high error days.

2.3.2.2 April 16, 2023

Table 4 provides a summary of forecast peak data for April 16, 2023.

Table 4: Peak Data Summary for April 16, 2023

	Load (MW)	Time	Error (%)[37]	Temperature Delta (°C)[38]	Wind Speed Delta (km/h)[39]
Utility Forecast	939	10:00 a.m.	9.6	(1.00)	(2.0)
Utility Actual	857	9:00 a.m.		(1.00)	(2.0)
Total Forecast	1,006	10:00 a.m.	0.2	(1.00)	(2.0)
Total Actual	1,003	9:00 a.m.		(1.00)	(2.0)
Board Forecast	1,310	N/A	N/A	N/A	N/A
Board Actual	1,237				

[37] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[38] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[39] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,310 MW; the actual reported peak was 1,237 MW. Chart 16 to Chart 20 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 16 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 10:00 a.m. peak of 1,006 MW; the actual peak was 1,003 MW and occurred at 9:00 a.m., resulting in an overestimate of 0.2%. The forecast load at the time of peak was 993 MW.

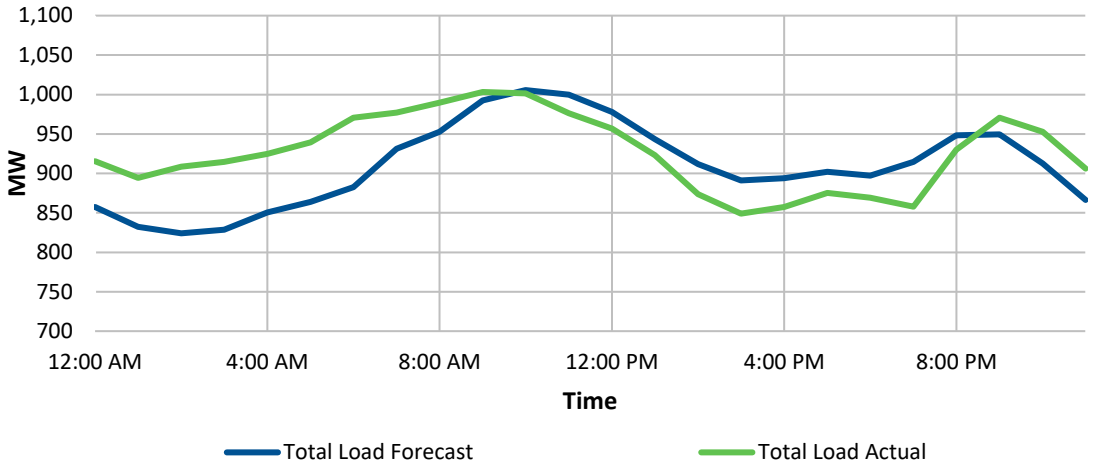

Chart 16: Forecast vs Actual Total Load for April 16, 2023

Chart 17 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 10:00 a.m. of 939 MW; the actual peak was 857 MW and occurred at 9:00 a.m., resulting in an overestimate of 9.6%. Forecast load at time of peak was 926 MW.

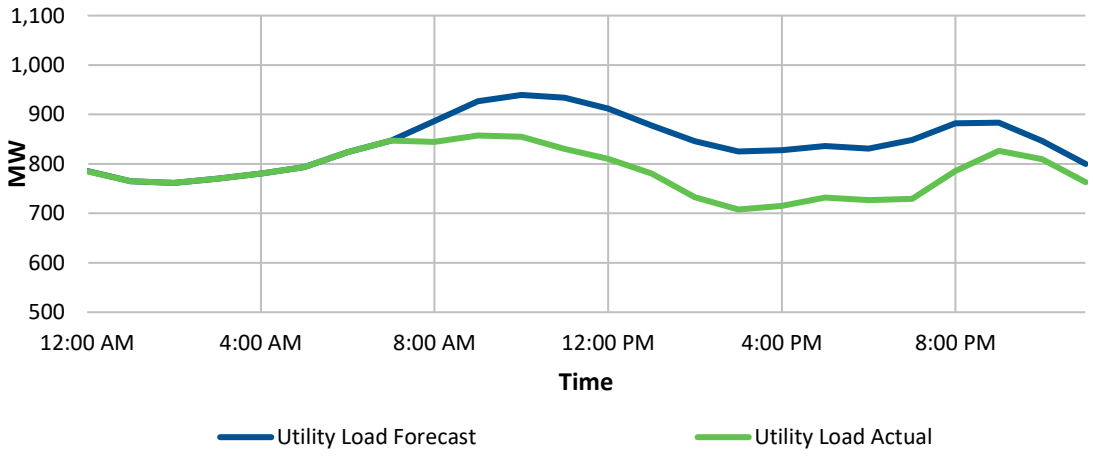

Chart 17: Forecast vs Actual Utility Load for April 16, 2023

Chart 18 shows the actual temperature in St. John's compared to the forecast. The temperature was warmer than forecast by 1°C in the three hours leading up to peak, which likely contributed to the forecast error.

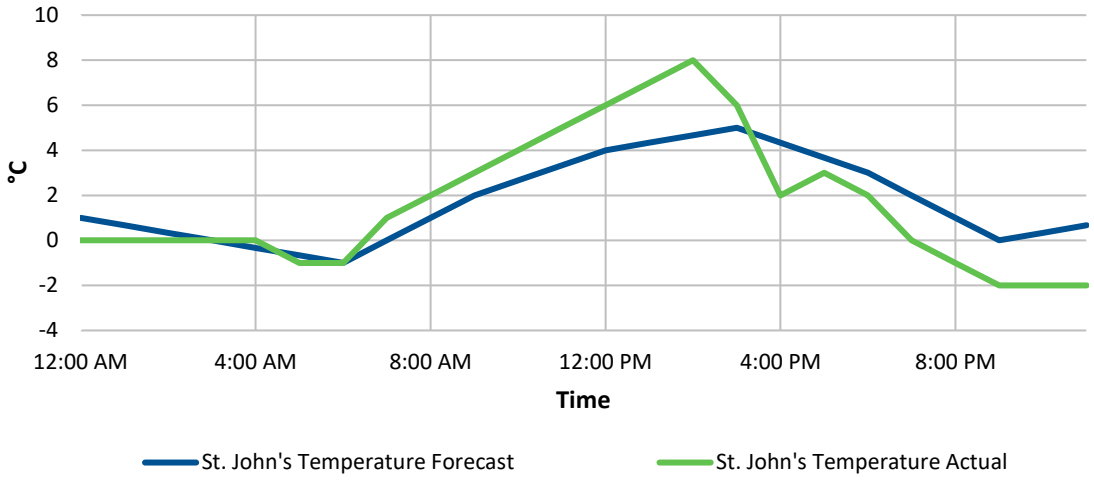

Chart 18: Forecast vs Actual Temperature for April 16, 2023

Chart 19 shows the actual wind speed in St. John's compared to the forecast. For the hours leading up to peak, the actual wind speed was lower than forecast, which likely contributed to the load forecast error.

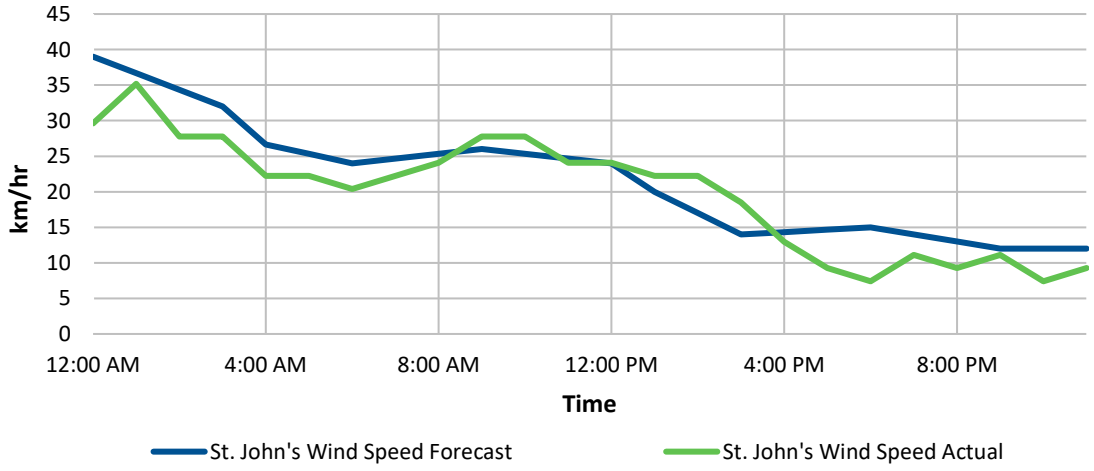

Chart 19: Forecast vs Actual Wind Speed for April 16, 2023

Chart 20 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

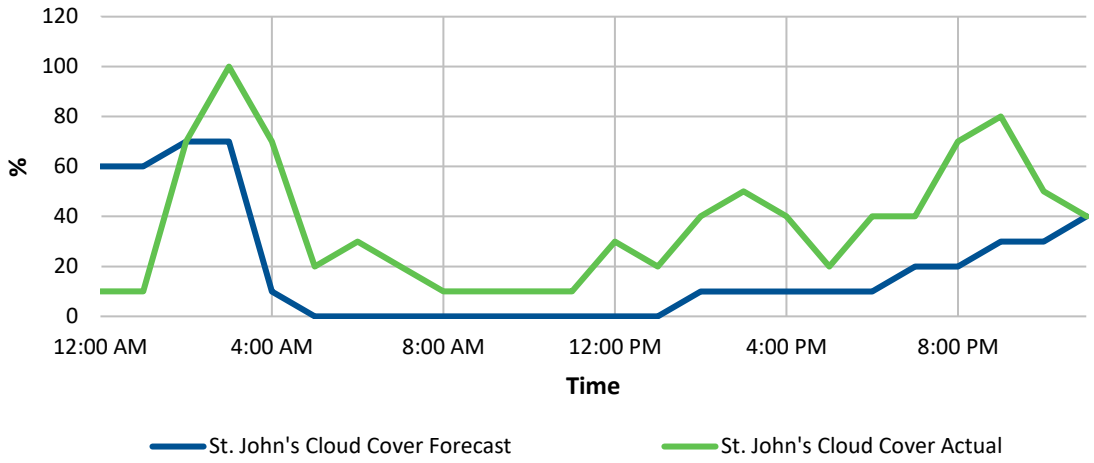

Chart 20: Forecast vs Actual Cloud Cover for April 16, 2023

While weather may have been a contributing factor to the discrepancy between Utility Actual and Utility Forecast load, error on this day may also be attributed to the software program learning behaviour in shoulder periods.

2.3.2.3 April 22, 2023

Table 5 provides a summary of forecast peak data for April 22, 2023.

Table 5: Peak Data Summary for April 22, 2023

	Load (MW)	Time	Error (%)[40]	Temperature Delta (°C)[41]	Wind Speed Delta (km/h)[42]
Utility Forecast	961	10:00 a.m.	-6.1	0.00	6
Utility Actual	1,024	11:00 a.m.		1.00	1
Total Forecast	1,124	10:00 a.m.	-3.7	0.00	6
Total Actual	1,168	11:00 a.m.		1.00	1
Board Forecast	1,455	N/A	N/A	N/A	N/A
Board Actual	1,438				

[40] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[41] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[42] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,455 MW; the actual reported peak was 1,438 MW. Chart 21 to Chart 25 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 21 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 10:00 a.m. peak of 1,124 MW; the actual peak was 1,168 MW and occurred at 11:00 a.m., resulting in an underestimate of 3.7%. The forecast load at the time of peak 1,124 MW.

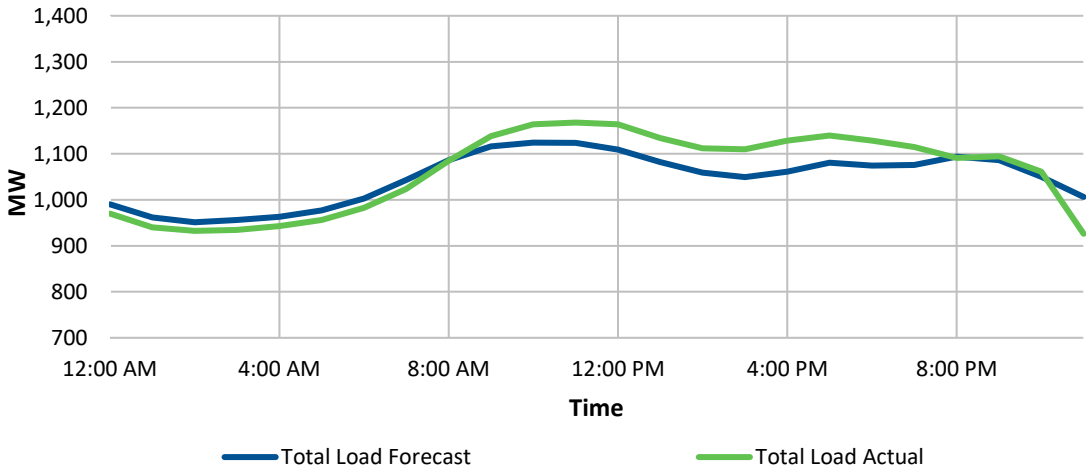

Chart 21: Forecast vs Actual Total Load for April 22, 2023

Chart 22 shows the hourly distribution of the utility load forecast. The hourly forecast predicted a utility peak at 10:00 a.m. of 961 MW; the actual peak was 1,024 MW and occurred at 11:00 a.m.; resulting in an underestimate of 6.1%. The forecast load at the time of peak was 961 MW.

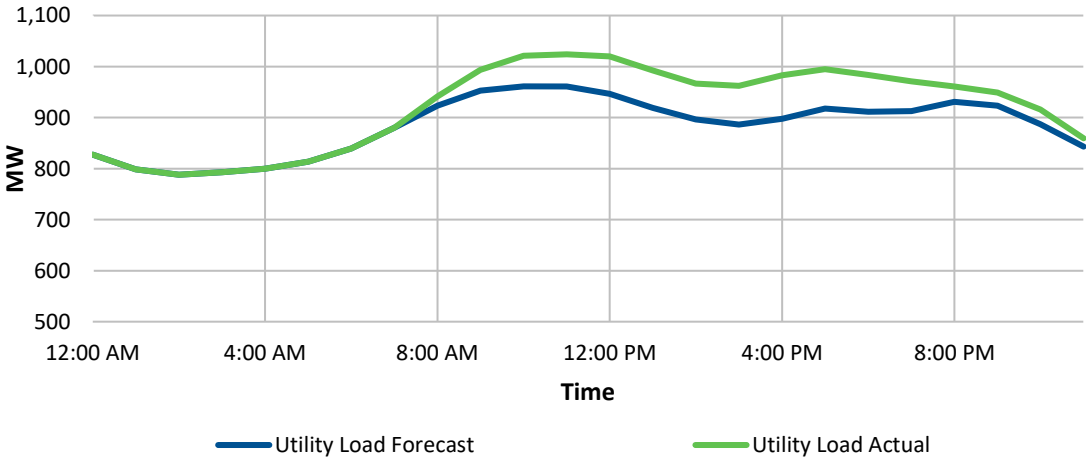

Chart 22: Forecast vs Actual Utility Load for April 22, 2023

Chart 23 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast and is not thought to have contributed to the forecast error.

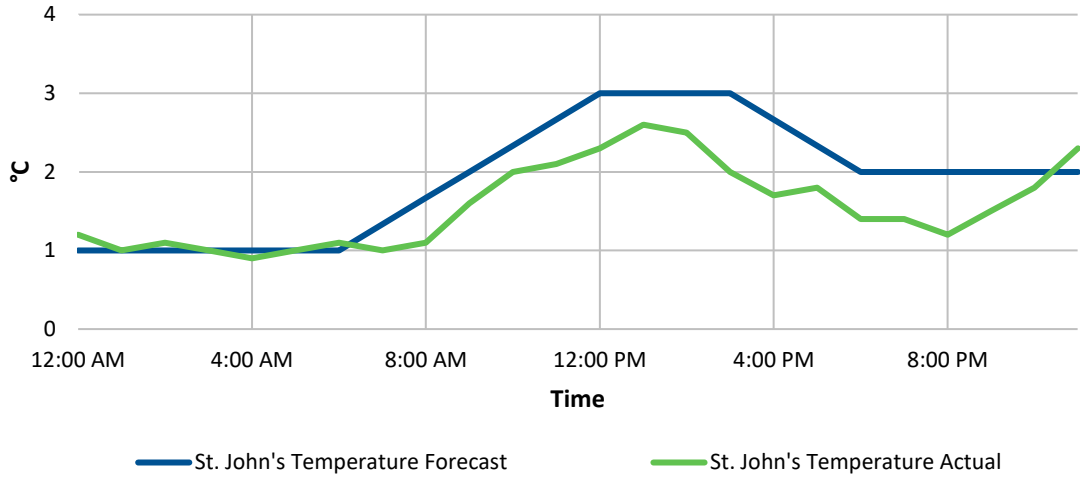

Chart 23: Forecast vs Actual Temperature for April 22, 2023

Chart 24 and Chart 25 are provided for context; however, the discrepancy between the Utility Actual and Utility Forecast load was attributed to ongoing work on the EMS. For the two days prior, the load forecasting software was not receiving actual load data, negatively impacting the forecast.

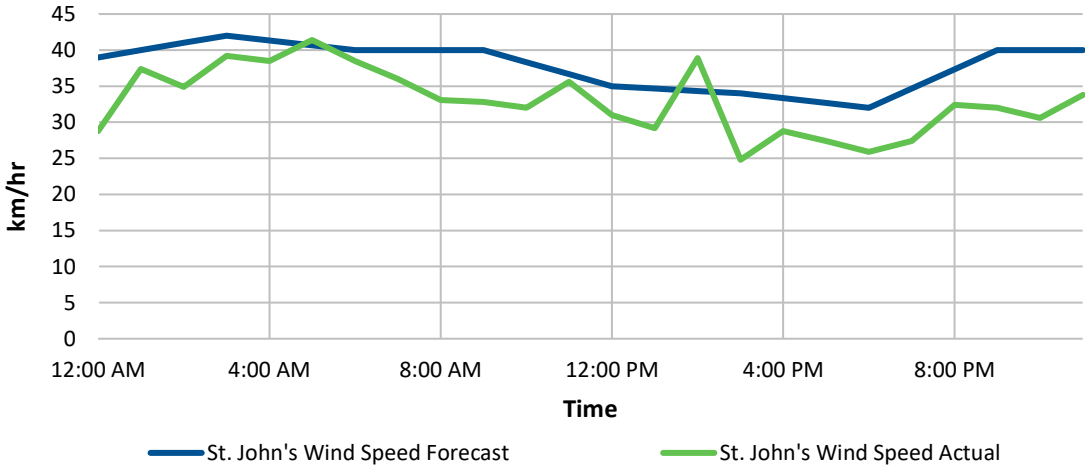

Chart 24: Forecast vs Actual Wind Speed for April 22, 2023

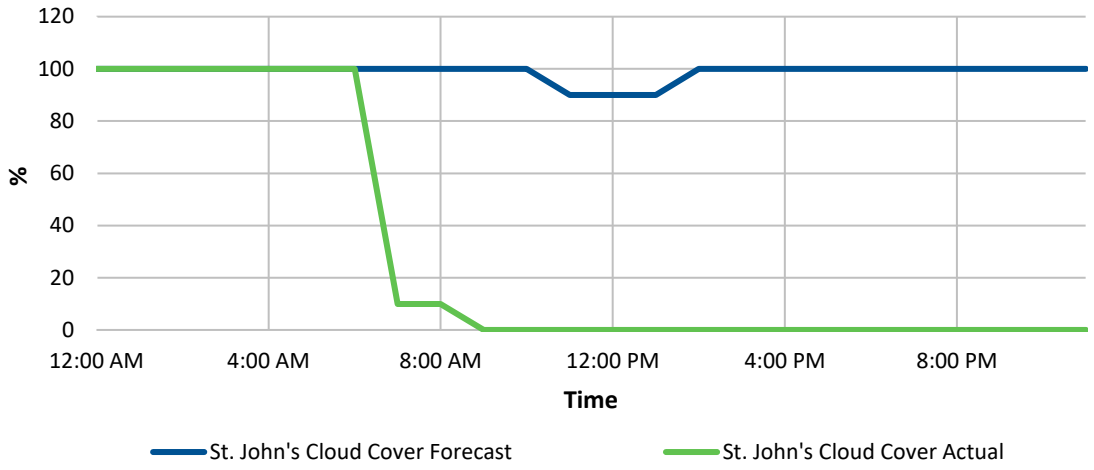

Chart 25: Forecast vs Actual Cloud Cover for April 22, 2023

2.3.3 May 2023

In May 2023, the forecast utility peak was 1,038 MW, which is consistent with the actual utility peak of 1,030 MW. Absolute error was 15 MW on average, with an average percent error of 0.2%, an average absolute error of 1.9%, and an average actual/forecast of 0.1%.

2.3.3.1 May 5, 2023

Table 6 provides a summary of forecast peak data for May 5, 2023.

Table 6: Peak Data Summary for May 5, 2023

	Load (MW)	Time	Error (%)[43]	Temperature Delta (°C)[44]	Wind Speed Delta (km/h)[45]
Utility Forecast	960	9:00 a.m.	-6.2	1.00	9
Utility Actual	1,023	9:00 a.m.		1.00	9
Total Forecast	1,094	9:00 a.m.	-2.9	1.00	9
Total Actual	1,127	9:00 a.m.		1.00	9
Board Forecast	1,390	N/A	N/A	N/A	N/A
Board Actual	1,419				

[43] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[44] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[45] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,390 MW; the actual reported peak was 1,419 MW. Chart 26 to Chart 30 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 26 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 9:00 a.m. peak of 1,094 MW; the actual peak was 1,127 MW, resulting in an underestimate of 2.9%.

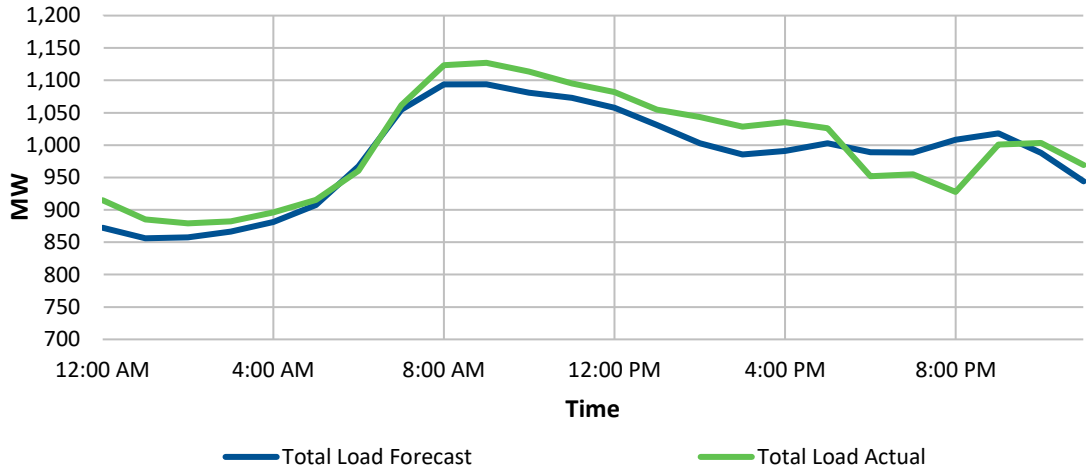

Chart 26: Forecast vs Actual Total Load for May 5, 2023

Chart 27 shows the hourly distribution of the utility load forecast. The hourly forecast predicted a utility peak at 9:00 a.m. of 960 MW; the actual peak was 1,023 MW; resulting in an underestimate of 6.2%.

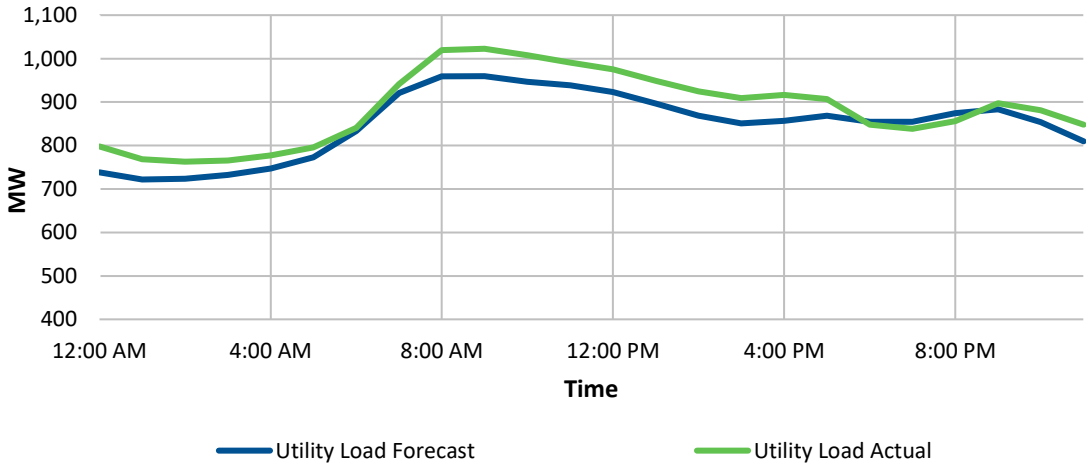

Chart 27: Forecast vs Actual Utility Load for May 5, 2023

Chart 28 shows the actual temperature in St. John's compared to forecast. The temperature was 1°C colder than forecast at the time of peak.

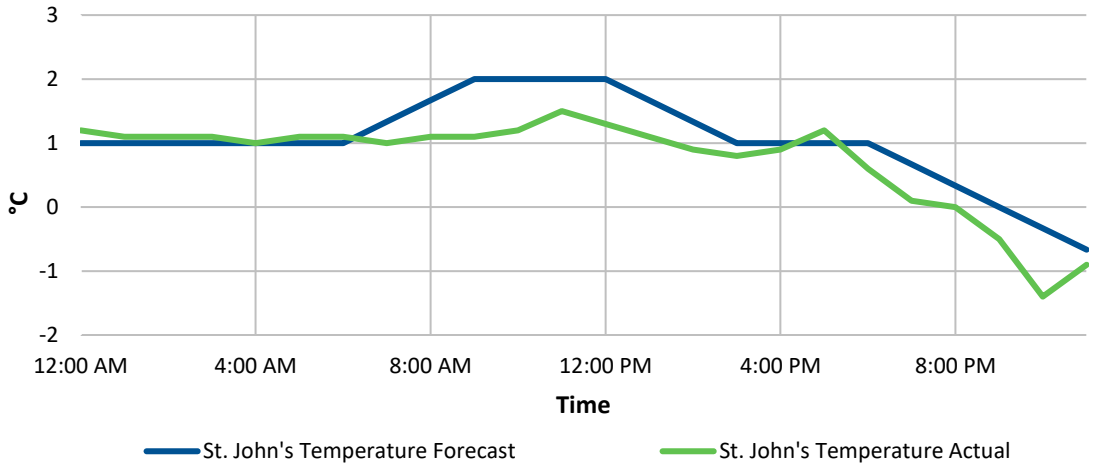

Chart 28: Forecast vs Actual Temperature for May 5, 2023

Chart 29 shows the actual wind speed in St. John's compared to forecast. The actual wind speed at the time of peak were slightly less than forecast.

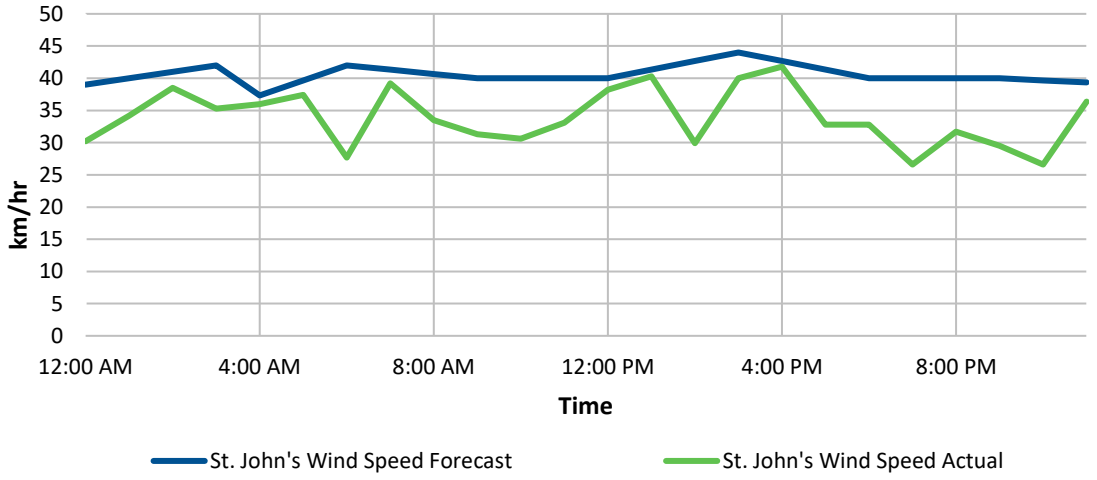

Chart 29: Forecast vs Actual Wind Speed for May 5, 2023

Chart 30 shows the actual cloud cover in St. John's compared to the forecast. Cloud cover data was unavailable for the majority of the day.

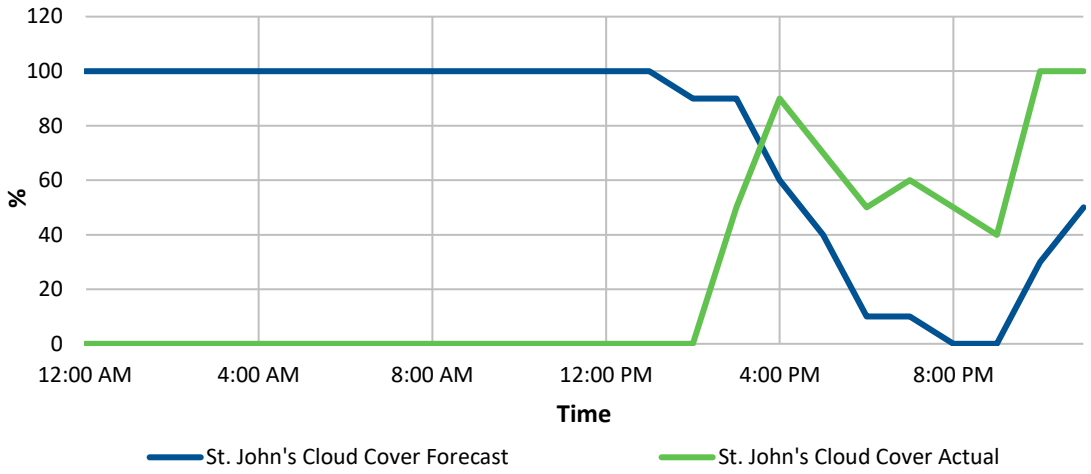

Chart 30: Forecast vs Actual Cloud Cover for May 5, 2023

The discrepancy between the Utility Actual and Utility forecast load was likely due to colder than forecast temperatures.

2.3.3.2 May 21, 2023

Table 7 provides a summary of forecast peak data for May 21, 2023.

Table 7: Peak Data Summary for May 21, 2023

	Load (MW)	Time	Error (%)[46]	Temperature Delta (°C)[47]	Wind Speed Delta (km/h)[48]
Utility Forecast	682	11:00 a.m.	6.5	(4.00)	3
Utility Actual	641	10:00 a.m.		(3.00)	3
Total Forecast	807	11:00 a.m.	11.3	(4.00)	3
Total Actual	725	12:00 p.m.		(3.00)	6
Board Forecast	1,165	N/A	N/A	N/A	N/A
Board Actual	1,083				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,165 MW; the actual reported peak was 1,083 MW. Chart 31 to Chart 35 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[46] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[47] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[48] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 31 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted an 11:00 a.m. peak of 807 MW; the actual peak of 725 MW occurred at 12:00 p.m., resulting in an overestimate of 11.3%. The forecast load at this time was 801 MW.

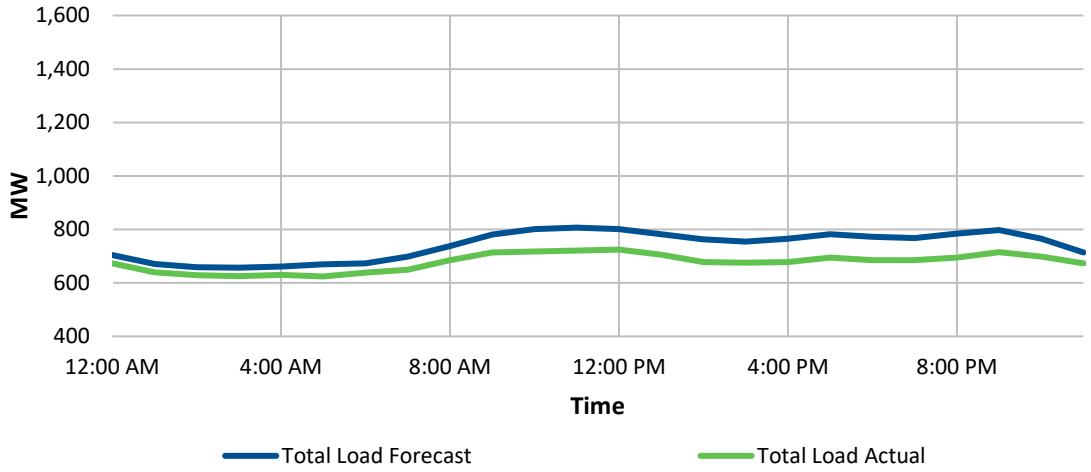

Chart 31: Forecast vs Actual Total Load for May 21, 2023

Chart 32 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 11:00 a.m. of 682 MW; the actual peak was 641 MW and occurred at 10:00 a.m., resulting in an overestimate of 6.5%. The total load forecast at this time was 676 MW.

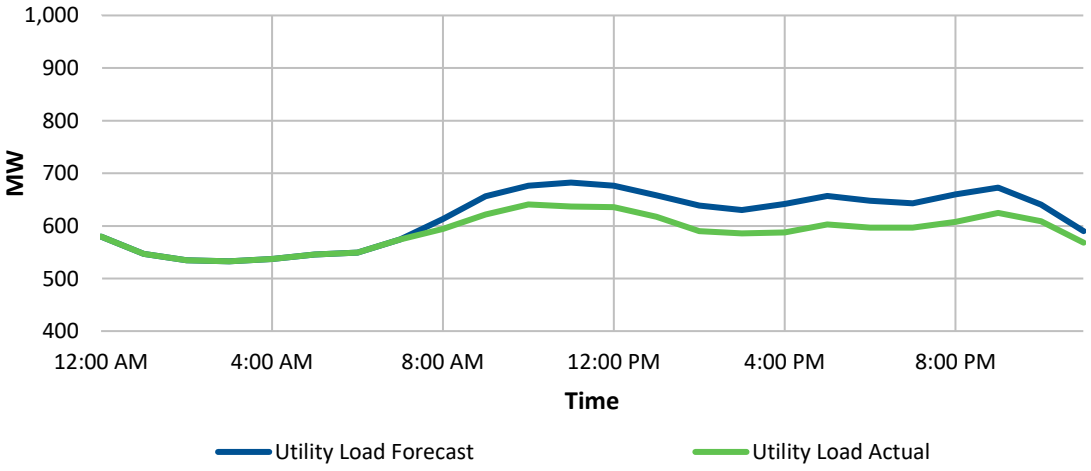

Chart 32: Forecast vs Actual Utility Load for May 21, 2023

Chart 33 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 2°C warmer than forecast in the preceding five hours leading up to peak and 4 degrees warmer at time of peak, which would have contributed to the forecast error.

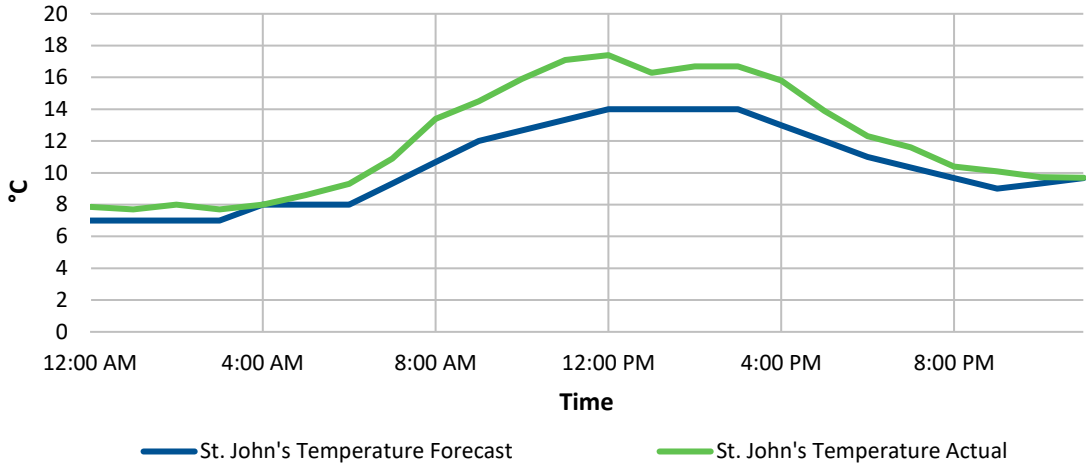

Chart 33: Forecast vs Actual Temperature for May 21, 2023

Chart 34 shows the actual wind speed in St. John's compared to the forecast. The actual wind speed was close to forecast for the day.

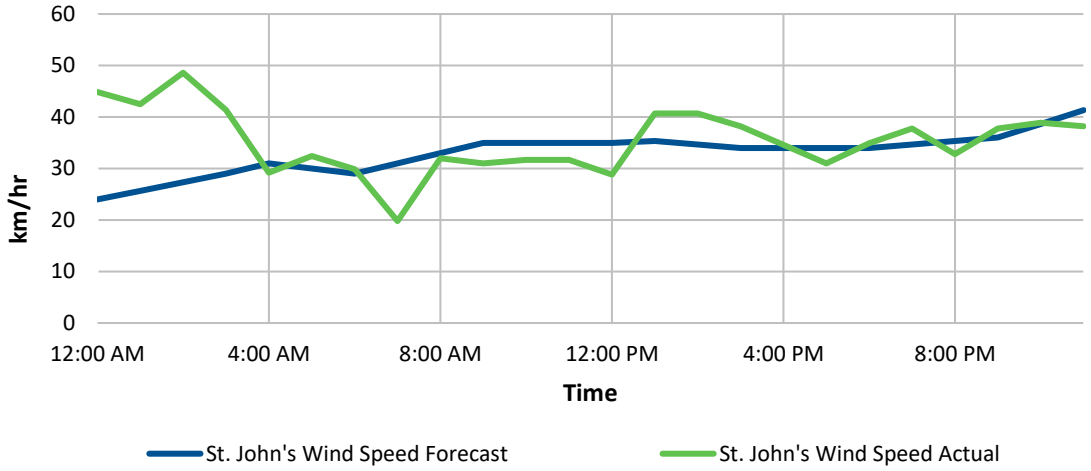

Chart 34: Forecast vs Actual Wind Speed for May 21, 2023

Chart 35 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

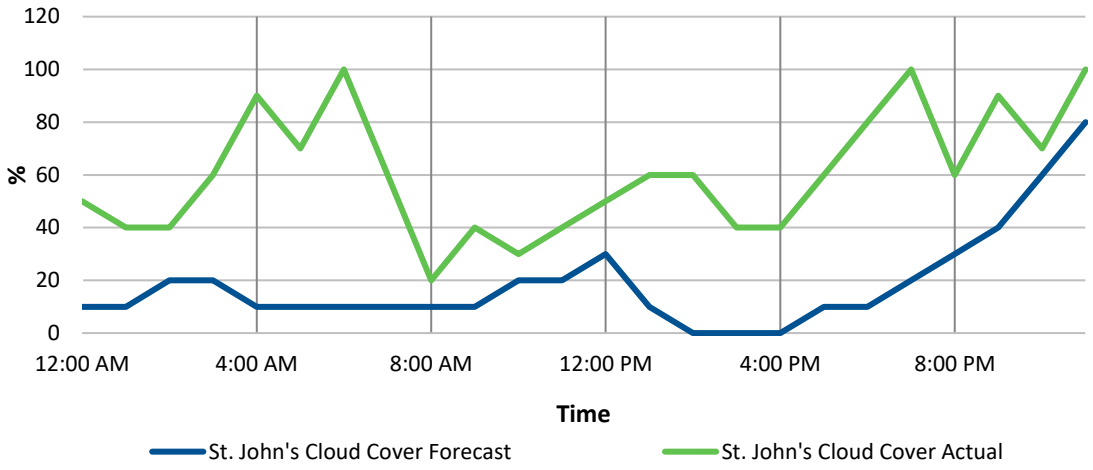

Chart 35: Forecast vs Actual Cloud Cover for May 21, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast.

2.3.3.3 May 22, 2023

Table 8 provides a summary of forecast peak data for May 22, 2023.

Table 8: Peak Data Summary for May 22, 2023

	Load (MW)	Time	Error (%)[49]	Temperature Delta (°C)[50]	Wind Speed Delta (km/h)[51]
Utility Forecast	780	9:00 p.m.	5.2	0.00	7
Utility Actual	741	9:00 p.m.		0.00	7
Total Forecast	904	9:00 p.m.	6.9	0.00	7
Total Actual	845	9:00 p.m.		0.00	7
Board Forecast	1,225	N/A	N/A	N/A	N/A
Board Actual	1,158				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,225 MW; the actual reported peak was 1,158 MW. Chart 36 to Chart 40 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[49] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[50] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[51] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 36 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 9:00 p.m. peak of 904 MW; the actual peak was 845 MW, resulting in an overestimate of 6.9%.

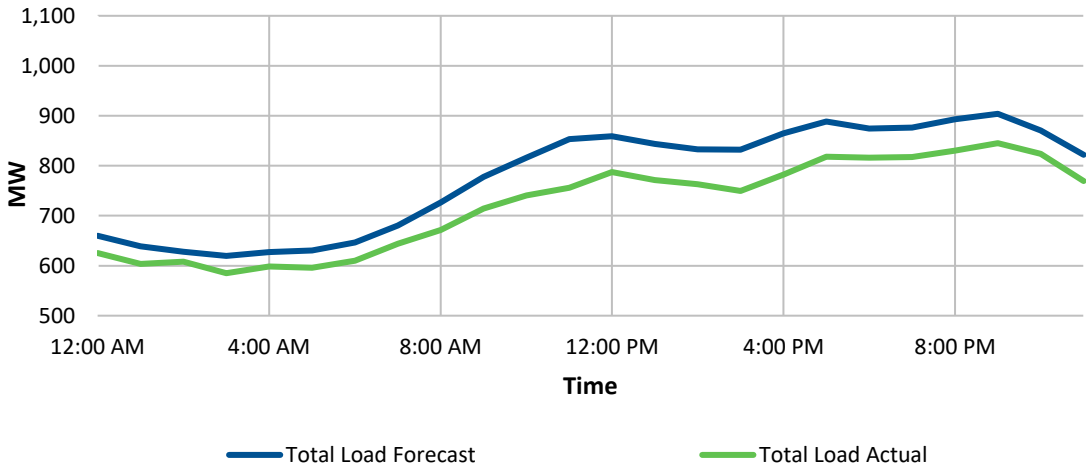

Chart 36: Forecast vs Actual Total Load May 22, 2023

Chart 37 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 9:00 p.m. of 780 MW; the actual peak was 741 MW; resulting in an overestimate of 5.2%.

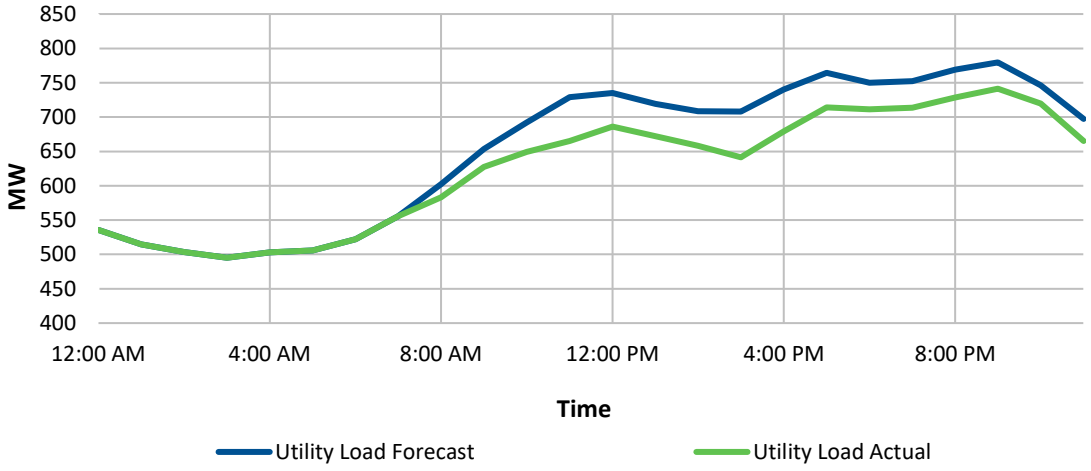

Chart 37: Forecast vs Actual Utility Load May 22, 2023

Chart 38, Chart 39, and Chart 40 are provided for context; however, the discrepancy between the Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour, as this day occurred on a statutory holiday—Victoria Day. In 2022, Hydro's load forecasting software also had a high degree of error for this day.

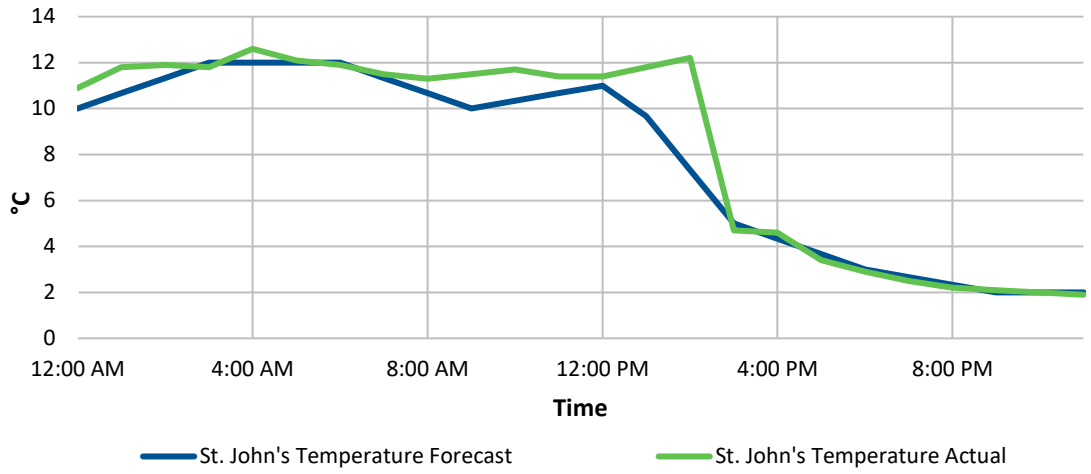

Chart 38: Forecast vs Actual Temperature May 22, 2023

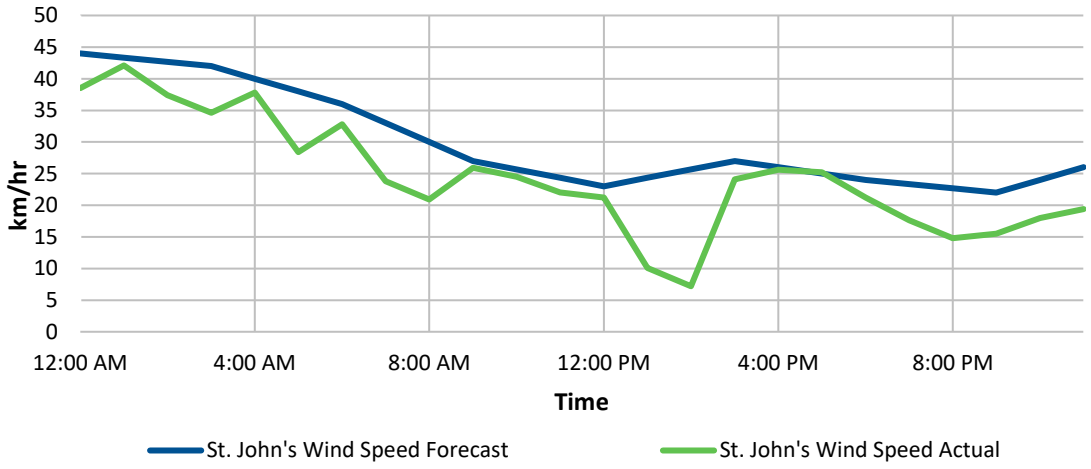

Chart 39: Forecast vs Actual Wind Speed May 22, 2023

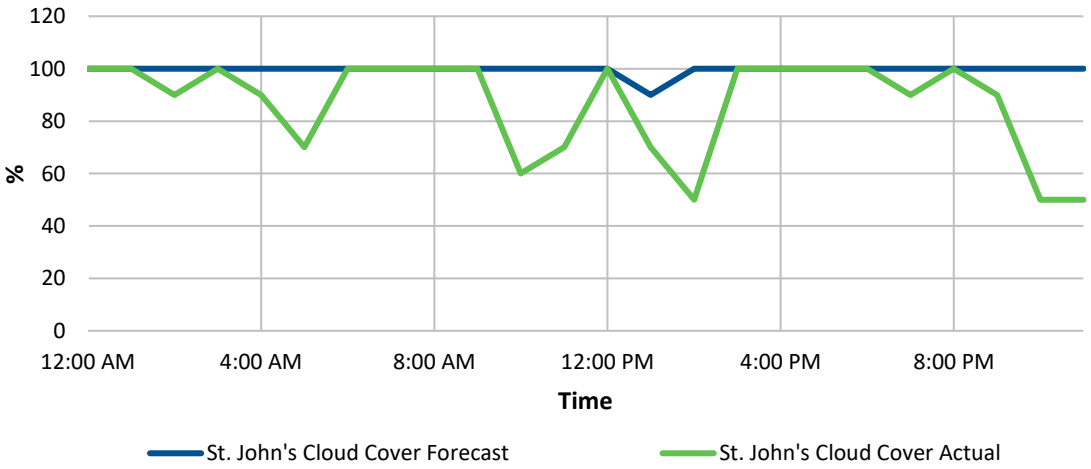

Chart 40: Forecast vs Actual Cloud Cover for May 22, 2023

2.3.4 June 2023

In June 2023, the forecast utility peak was 847 MW on June 12, 2023, which is consistent with the forecast utility peak for that day of 840 MW. The actual utility peak of 858 MW occurred on June 3, 2023 and was 8.5% higher than the forecast utility peak for that day of 785 MW. More information on June 3, 2023 is provided in Sections 2.3.4.1 to 2.3.4.3. Absolute error for the month was 20 MW on average, with an average percent error of -0.3%, an average absolute error of 2.8%, and an average actual/forecast of -0.5%.

2.3.4.1 June 3, 2023

Table 9 provides a summary of forecast peak data for June 3, 2023

Table 9: Peak Data Summary for June 3, 2023

	Load (MW)	Time	Error (%)[52]	Temperature Delta (°C)[53]	Wind Speed Delta (km/h)[54]
Utility Forecast	785	10:00 a.m.	-8.5	(1.00)	3
Utility Actual	858	5:00 p.m.		0.00	0
Total Forecast	909	10:00 a.m.	-3.9	(1.00)	3
Total Actual	947	5:00 p.m.		0.00	0
Board Forecast	1,075	N/A	N/A	N/A	N/A
Board Actual	1,111				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,075 MW; the actual reported peak was 1,111 MW. Chart 41 to Chart 45 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 41 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 10:00 a.m. peak of 909 MW; the actual peak was 947 MW and occurred at 5:00 p.m., resulting in an underestimate of 3.9%. The forecast load at the time of peak was 875 MW.

[52] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[53] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[54] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

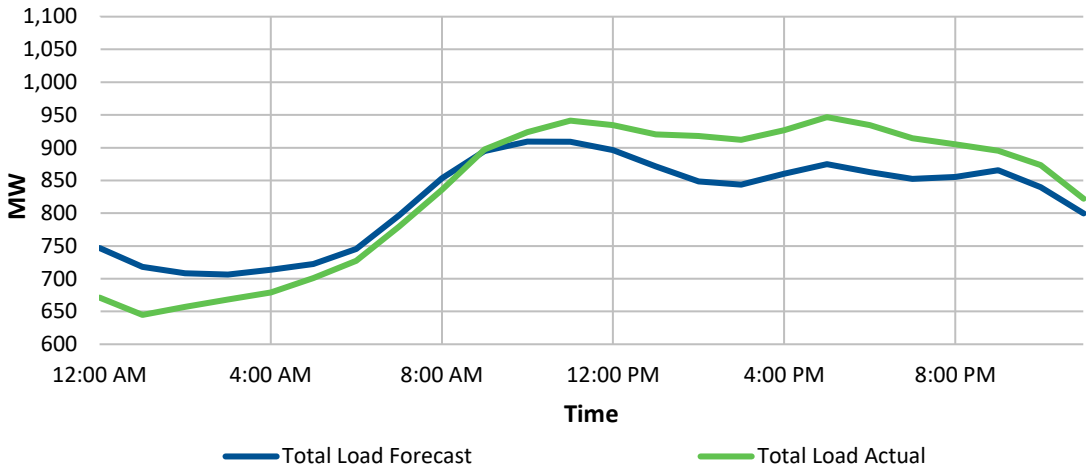

Chart 41: Forecast vs Actual Total Load for June 3, 2023

Chart 42 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 10:00 a.m. of 785 MW; the actual peak was 858 MW and occurred at 5:00 p.m.; resulting in an underestimate of 8.5%. The forecast load at the time of peak was 751 MW.

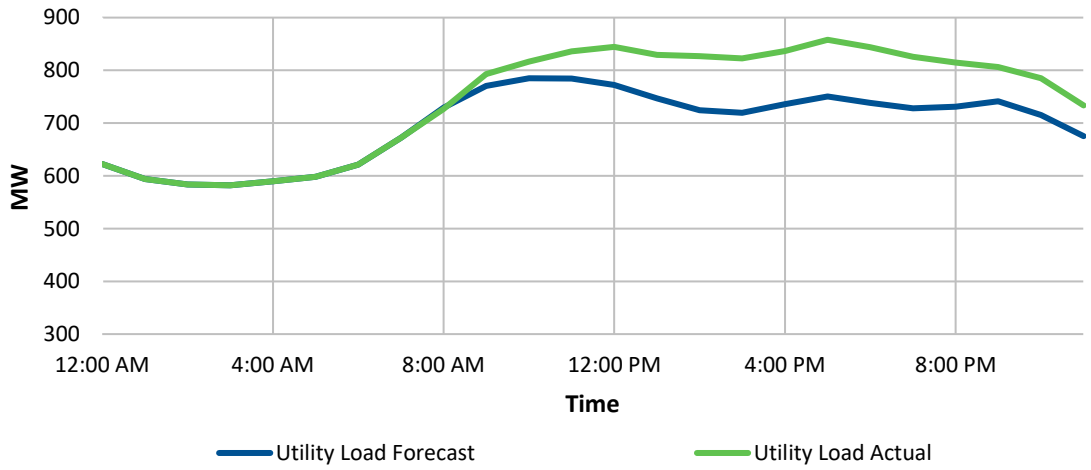

Chart 42: Forecast vs Actual Utility Load for June 3, 2023

Chart 43 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast for the majority of the day.

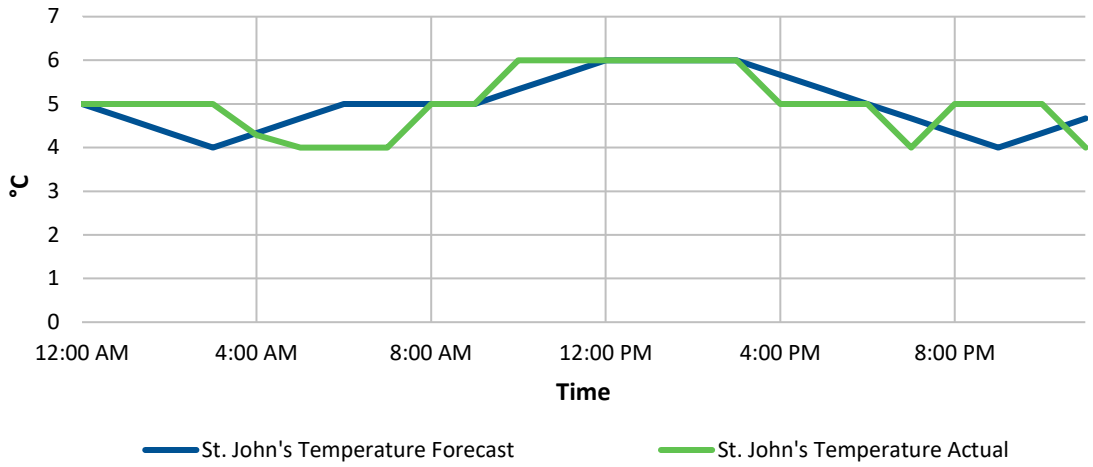

Chart 43: Forecast vs Actual Temperature for June 3, 2023

Chart 44 and Chart 45 are provided for context; however, the discrepancy between the Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour, as this day occurred on a Saturday. Additionally, the weather data for the previous day did not get uploaded into the load forecasting software at the scheduled times and as a result the load forecasting software was underestimating load for the majority of the day.

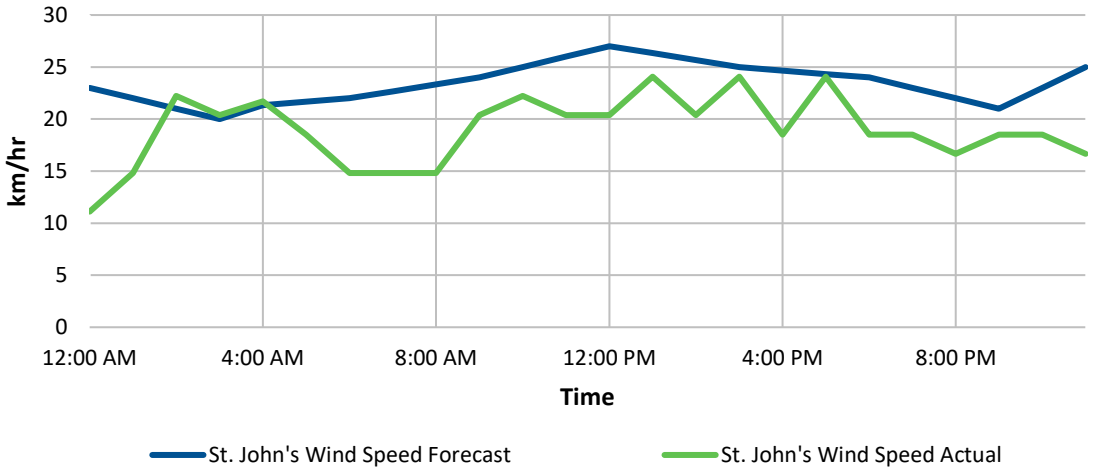

Chart 44: Forecast vs Actual Wind Speed for June 3, 2023

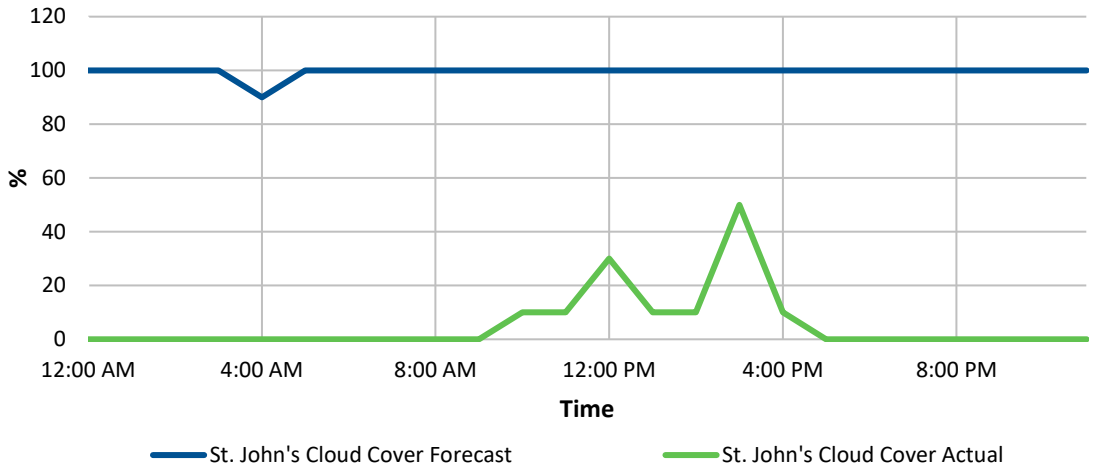

Chart 45: Forecast vs Actual Cloud Cover for June 3, 2023

2.3.4.2 June 10, 2023

Table 10 provides a summary of forecast peak data for June 10, 2023.

Table 10: Peak Data Summary for June 10, 2023

	Load (MW)	Time	Error (%)[55]	Temperature Delta (°C)[56]	Wind Speed Delta (km/h)[57]
Utility Forecast	701	10:00 a.m.	-11.1	0.00	(2.00)
Utility Actual	788	12:00 a.m.		2.00	(6.00)
Total Forecast	825	10:00 a.m.	-6.2	0.00	(2.00)
Total Actual	880	12:00 p.m.		2.00	(6.00)
Board Forecast	1,145	N/A	N/A	N/A	N/A
Board Actual	1,210				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,145 MW; the actual reported peak was 1,210 MW. Chart 46 to Chart 50 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 46 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 10:00 a.m. peak of 825 MW; the actual peak was

[55] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[56] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[57] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

880 MW and occurred at 12:00 p.m., resulting in an underestimate of 6.2%. The forecast load at the time of peak was 813 MW.

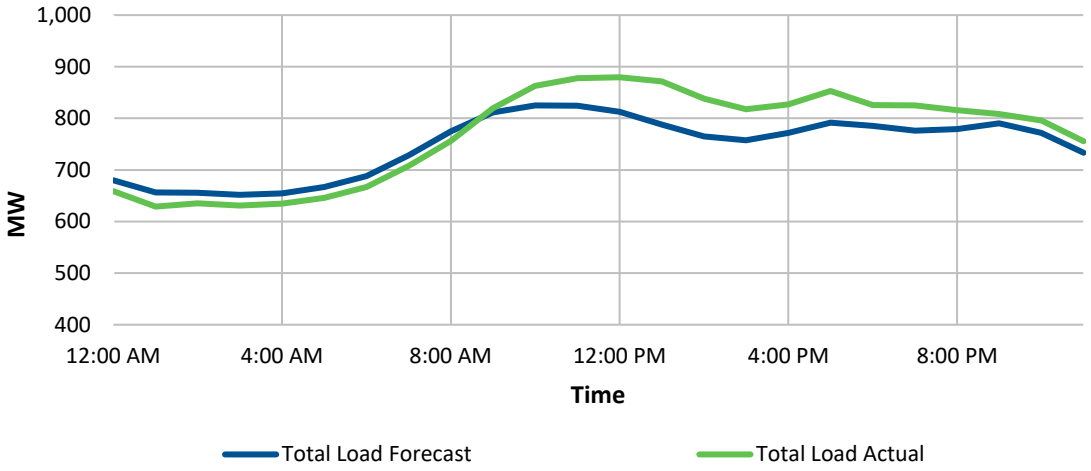

Chart 46: Forecast vs Actual Total Load June 10, 2023

Chart 47 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 10:00 a.m. of 701 MW; the actual peak was 788 MW and occurred at 12:00 p.m.; resulting in an underestimate of 11.1%. The forecast load at the time of peak was 688 MW.

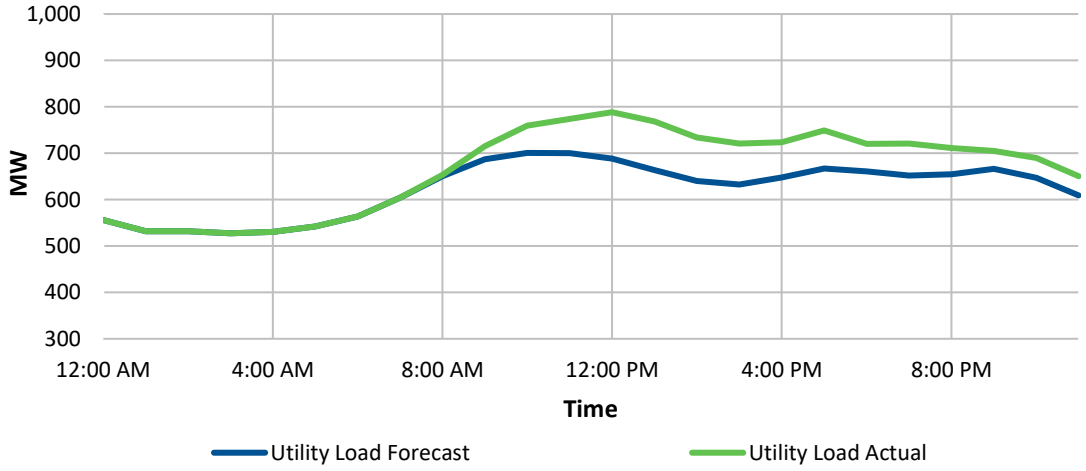

Chart 47: Forecast vs Actual Utility Load June 10, 2023

Chart 48 shows the actual temperature in St. John's compared to the forecast. The temperature was 2°C colder than forecast at the time of peak.

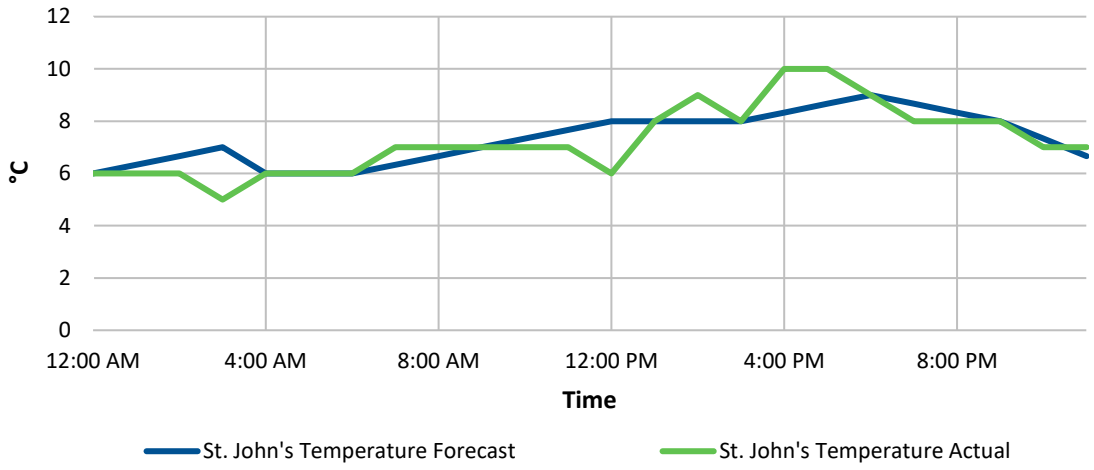

Chart 48: Forecast vs Actual Temperature for June 10, 2023

Chart 49 shows the actual wind speed in St. John's compared to the forecast. The wind speed was higher than forecast at the time of peak and in the previous two hours.

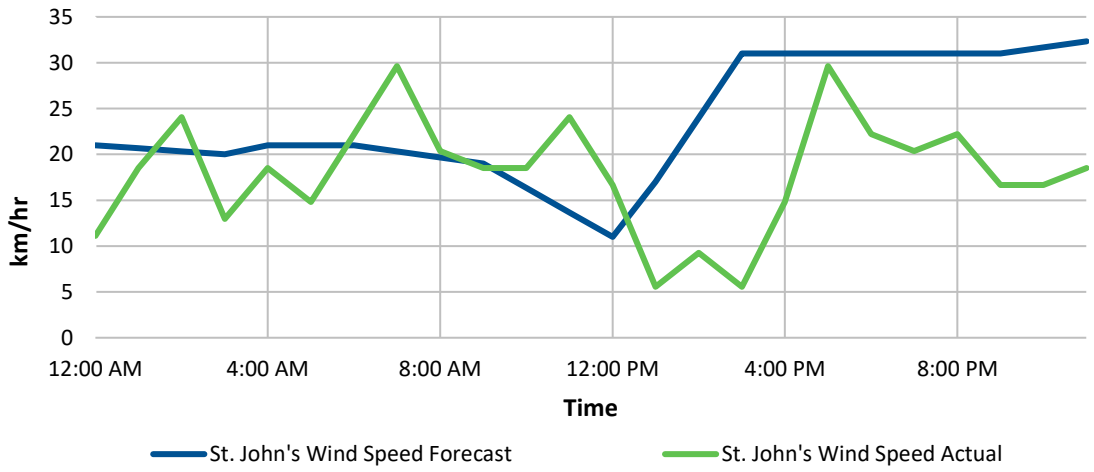

Chart 49: Forecast vs Actual Wind Speed for June 10, 2023

Chart 50 shows the actual cloud cover in St. John's compared to the forecast. It was less cloudy than forecast for the majority of the day.

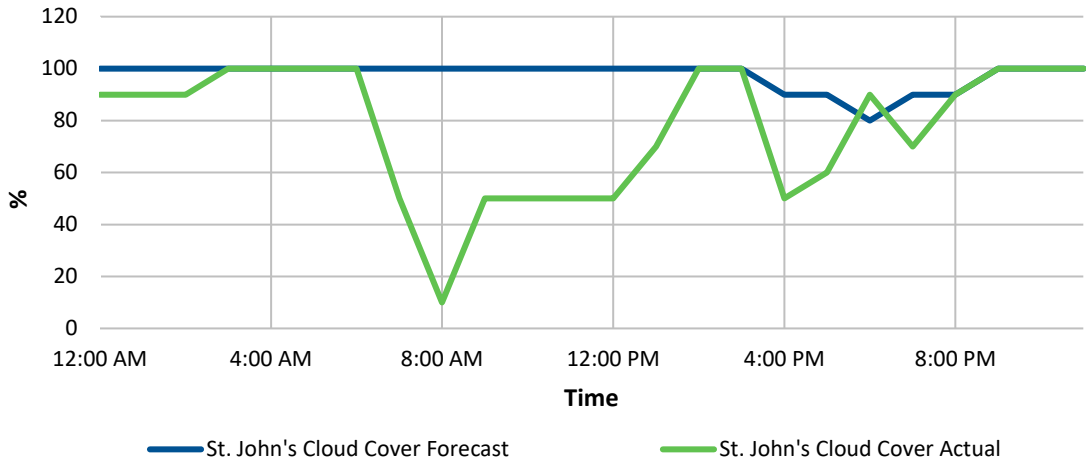

Chart 50: Forecast vs Actual Cloud Cover June 10, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the weather variations from the forecast; it was cooler and windier than forecast at the time of the utility peak.

2.3.4.3 June 22, 2023

Table 11 provides a summary of forecast peak data for June 22, 2023.

Table 11: Peak Data Summary for June 22, 2023

	Load (MW)	Time	Error (%)[58]	Temperature Delta (°C)[59]	Wind Speed Delta (km/h)[60]
Utility Forecast	636	12:00 p.m.	8.1	(2.00)	1.00
Utility Actual	589	6:00 p.m.		1.00	6.00
Total Forecast	755	12:00 p.m.	12.1	(2.00)	1.00
Total Actual	674	6:00 p.m.		1.00	6.00
Board Forecast	1,120	N/A	N/A	N/A	N/A
Board Actual	856				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,120 MW; the actual reported peak was 856 MW. Chart 51 to Chart 55 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[58] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[59] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[60] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 51 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 12:00 p.m. peak of 755 MW; the actual peak was 674 MW and occurred at 6:00 p.m., resulting in an overestimate of 12.1%. The forecast load at the time of peak was 729 MW.

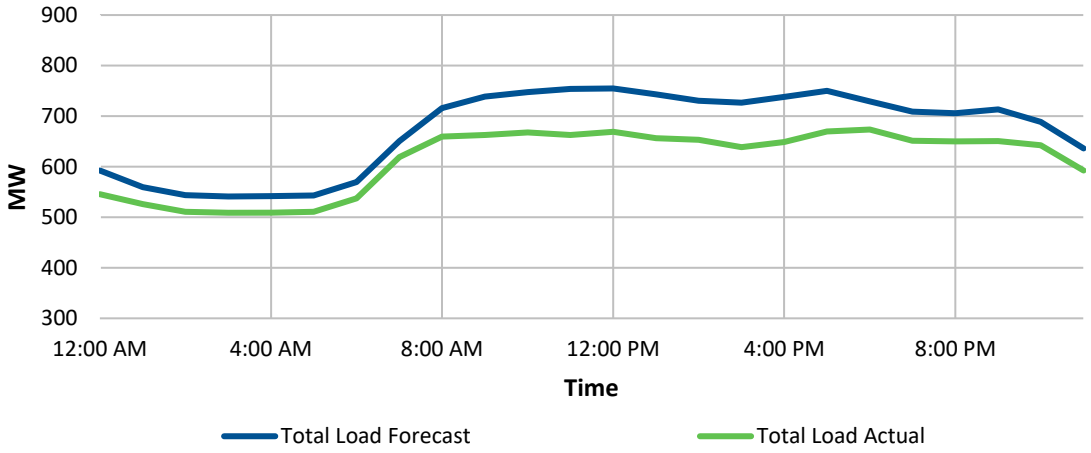

Chart 51: Forecast vs Actual Total Load for June 22, 2023

Chart 52 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 12:00 p.m. of 636 MW; the actual peak was 589 MW and occurred at 6:00 p.m.; resulting in an overestimate of 8.1%. The forecast load at the time of peak was 611 MW, resulting in an underestimate of 3.8% at the time of peak.

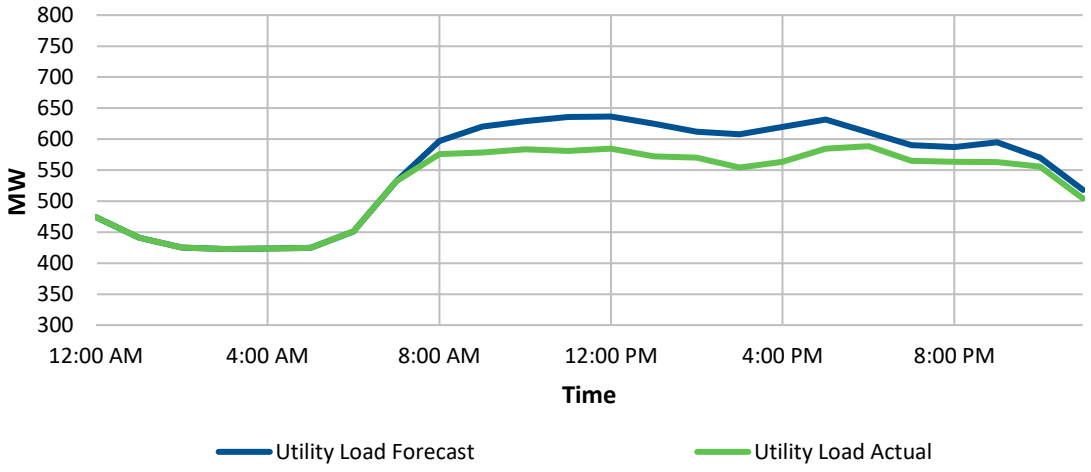

Chart 52: Forecast vs Actual Utility Load for June 22, 2023

Chart 53 shows the actual temperature in St. John's compared to the forecast. The temperature was 2°C warmer at the time of forecast peak but 1°C cooler than forecast at the actual time of peak. The difference in forecast and actual temperatures would have likely contributed to the forecast error.

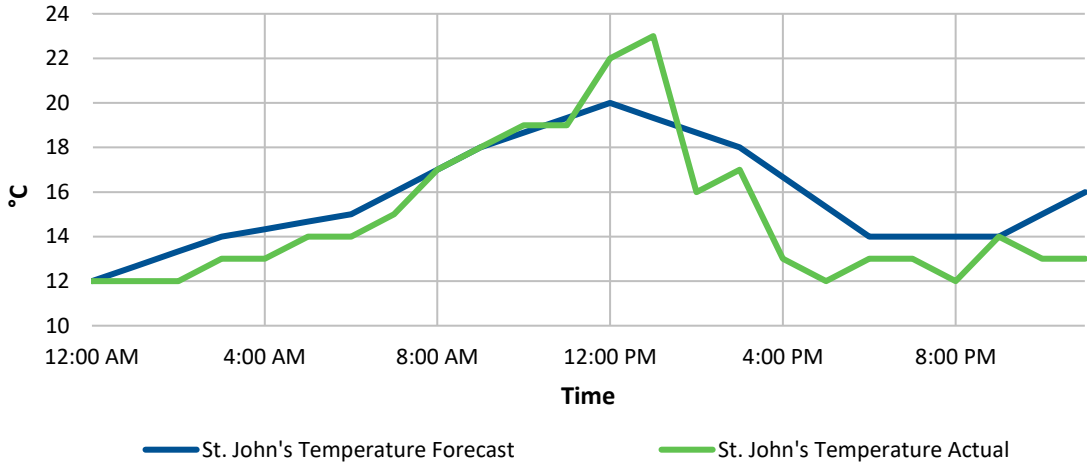

Chart 53: Forecast vs Actual Temperature for June 22, 2023

Chart 54 shows the actual wind speed in St. John's compared to the forecast. From 9:00 a.m. to 9:00 p.m., the wind speed averaged 3 km/hr less than forecast.

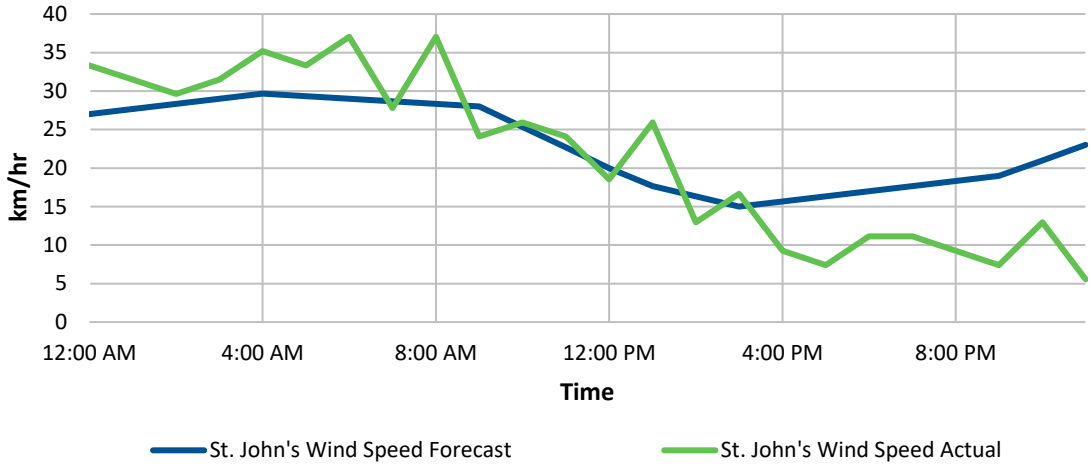

Chart 54: Forecast vs Actual Wind Speed for June 22, 2023

Chart 55 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

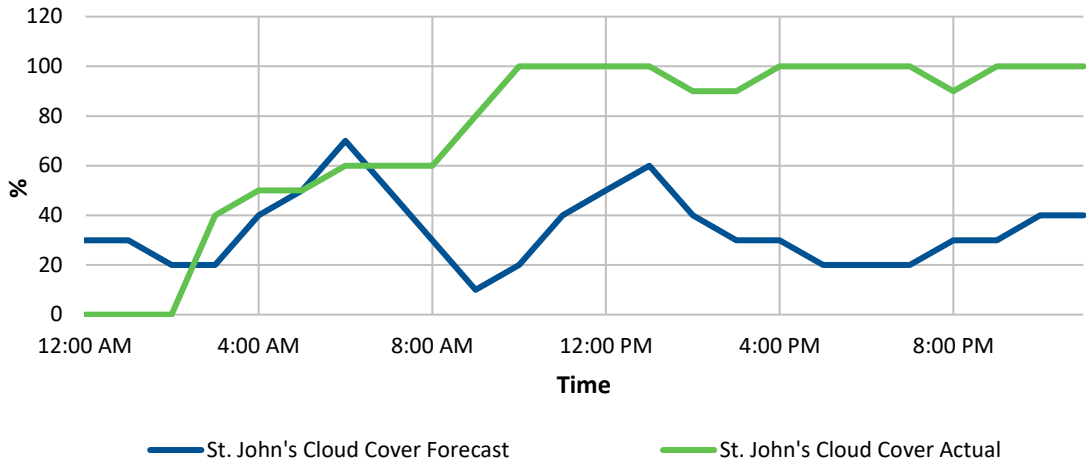

Chart 55: Forecast vs Actual Cloud Cover for June 22, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast.

2.3.5 July 2023

In July 2023 the forecast utility peak was 635 MW, which is consistent with the actual utility peak of 639 MW. Absolute error was 13 MW on average, with an average percent error of -0.8%, an average absolute error of 2.2%, and an average actual/forecast of -0.9%.

2.3.5.1 July 4, 2023

Table 12 provides a summary of forecast peak data for July 4, 2023.

Table 12: Peak Data Summary for July 4, 2023

	Load (MW)	Time	Error (%)[61]	Temperature Delta (°C)[62]	Wind Speed Delta (km/h)[63]
Utility Forecast	595	5:00 p.m.	-5.0	(1.00)	5.00
Utility Actual	627	5:00 p.m.		(1.00)	5.00
Total Forecast	758	5:00 p.m.	3.6	(1.00)	5.00
Total Actual	732	5:00 p.m.		(1.00)	5.00
Board Forecast	1,100	N/A	N/A	N/A	N/A
Board Actual	1,074				

[61] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[62] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[63] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,110 MW; the actual reported peak was 1,074 MW. Chart 56 to Chart 60 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 56 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 758 MW; the actual peak was 732 MW, resulting in an overestimate of 3.6%.

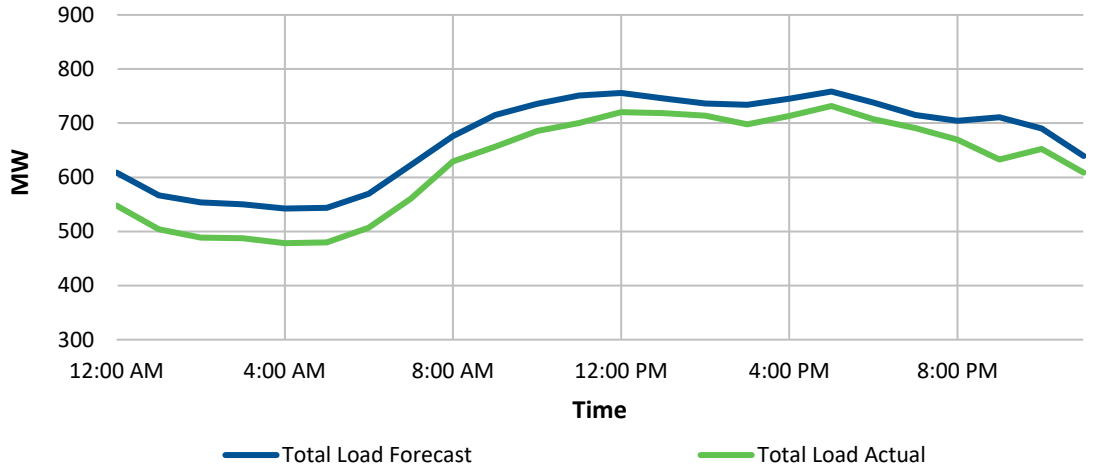

Chart 56: Forecast vs Actual Total Load for July 4, 2023

Chart 57 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 595 MW; the actual peak was 627 MW, resulting in an underestimate of 5.0%.

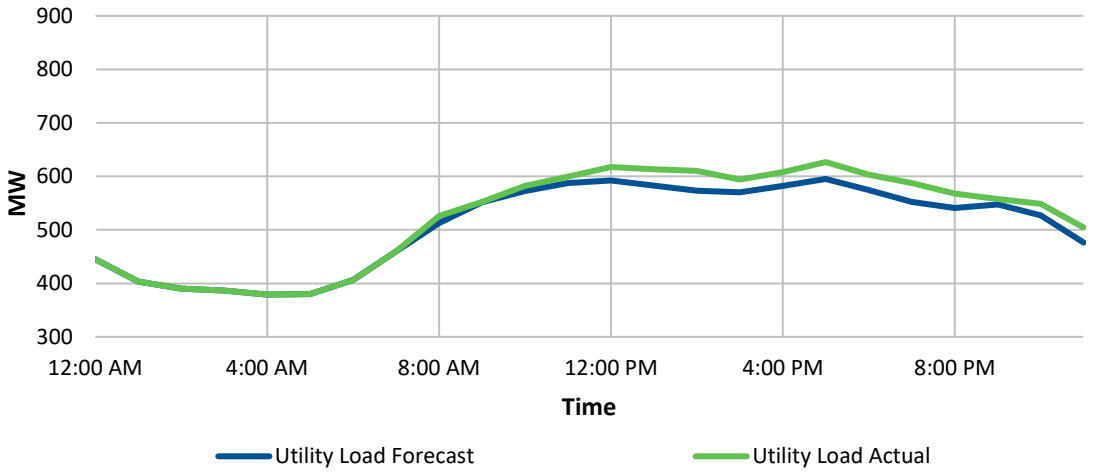

Chart 57: Forecast vs Actual Utility Load for July 4, 2023

Chart 58 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 1°C warmer throughout the day than forecast. There may have been some cooling load impacts and the difference in forecast and actual temperatures may have contributed to the forecast error.

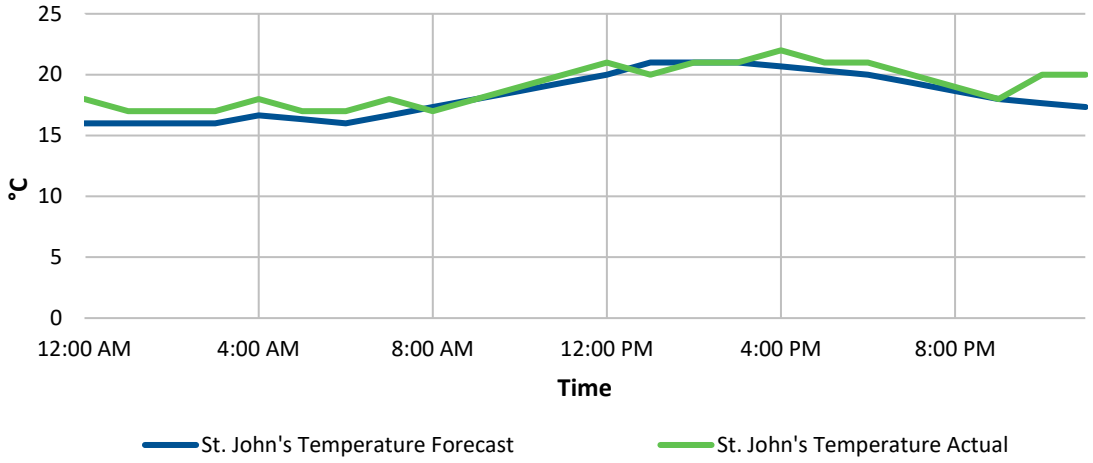

Chart 58: Forecast vs Actual Temperature for July 4, 2023

Chart 59 shows the actual wind speed compared to the forecast. From 9:00 a.m. to 9:00 p.m., the wind speed averaged 7 km/hr less than forecast.

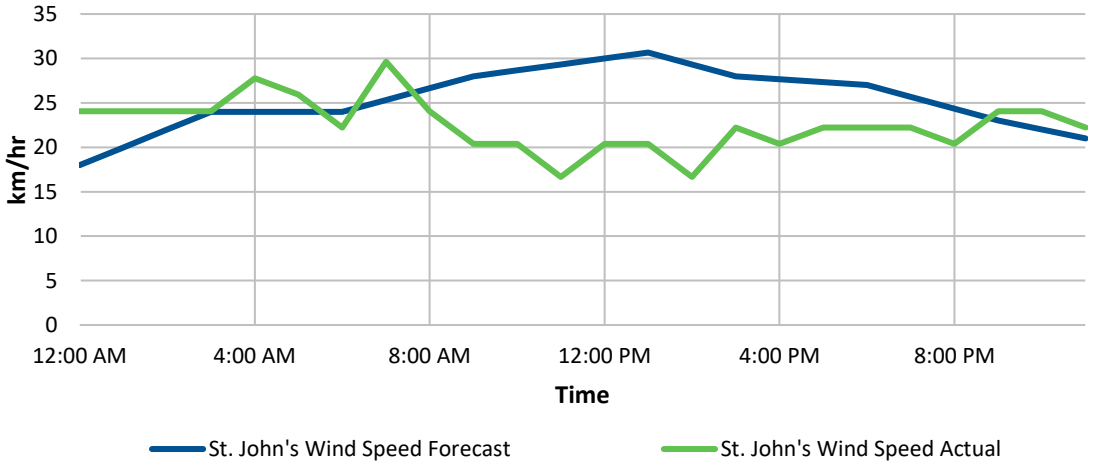

Chart 59: Forecast vs Actual Wind Speed for July 4, 2023

Chart 60 shows the actual cloud cover in St. John's compared to the forecast. Cloud cover was similar to forecast for the majority of the day.

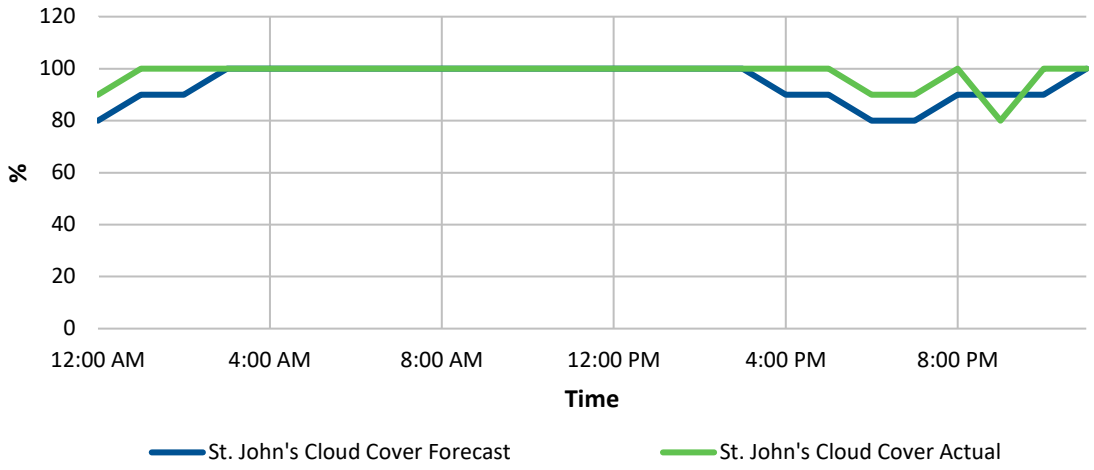

Chart 60: Forecast vs Actual Cloud Cover for July 4, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast.

2.3.5.2 July 13, 2023

Table 13 provides a summary of forecast peak data for July 13, 2023.

Table 13: Peak Data Summary for July 13, 2023

	Load (MW)	Time	Error (%)[64]	Temperature Delta (°C)[65]	Wind Speed Delta (km/h)[66]
Utility Forecast	560	5:00 p.m.	-6.5	(2.00)	(4.00)
Utility Actual	598	5:00 p.m.		(2.00)	(4.00)
Total Forecast	678	5:00 p.m.	-1.4	(2.00)	(4.00)
Total Actual	687	2:00 p.m.		(1.00)	0.00
Board Forecast	680	N/A	N/A	N/A	N/A
Board Actual	698				

The forecast peak at 7:20 a.m., as reported to the Board, was 680 MW; the actual reported peak was 698 MW. Chart 61 to Chart 65 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[64] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[65] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[66] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 61 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 678 MW; the actual peak was 687 MW and occurred at 2:00 p.m., resulting in an underestimate of 1.4%. The forecast load at the time of peak was 662 MW.

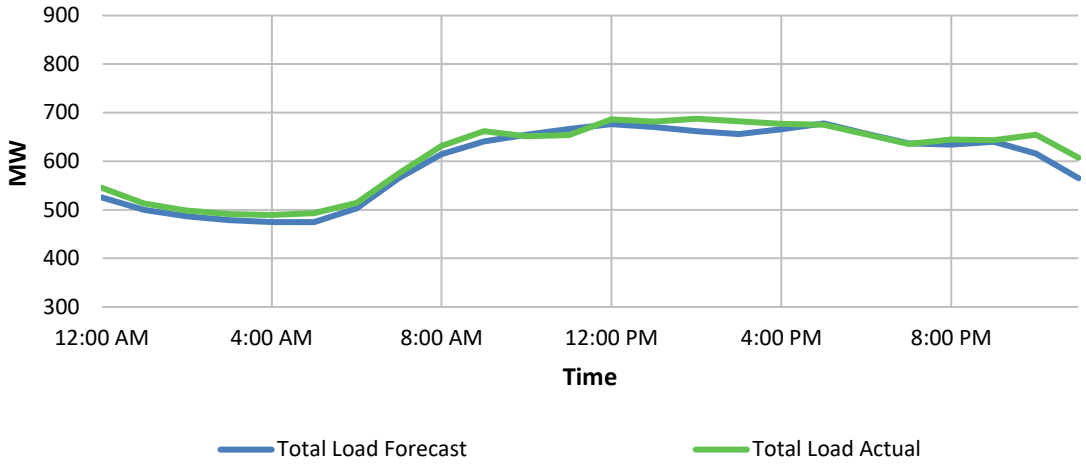

Chart 61: Forecast vs Actual Total Load for July 13, 2023

Chart 62 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 560 MW; the actual peak was 598 MW, resulting in an underestimate of 6.5%.

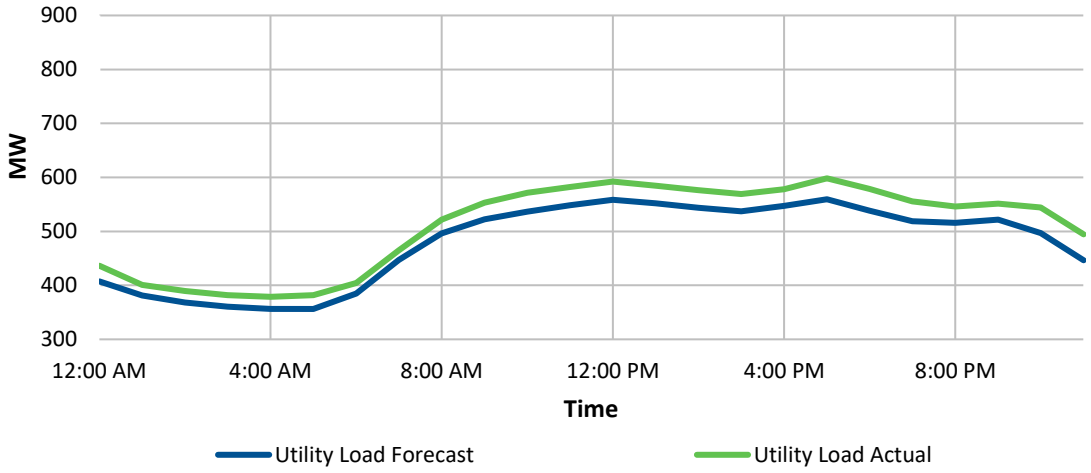

Chart 62: Forecast vs Actual Utility Load for July 13, 2023

Chart 63 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 2°C warmer throughout the day than forecast. There may have been some cooling load impacts and the difference in forecast and actual temperatures may have contributed to the forecast error.

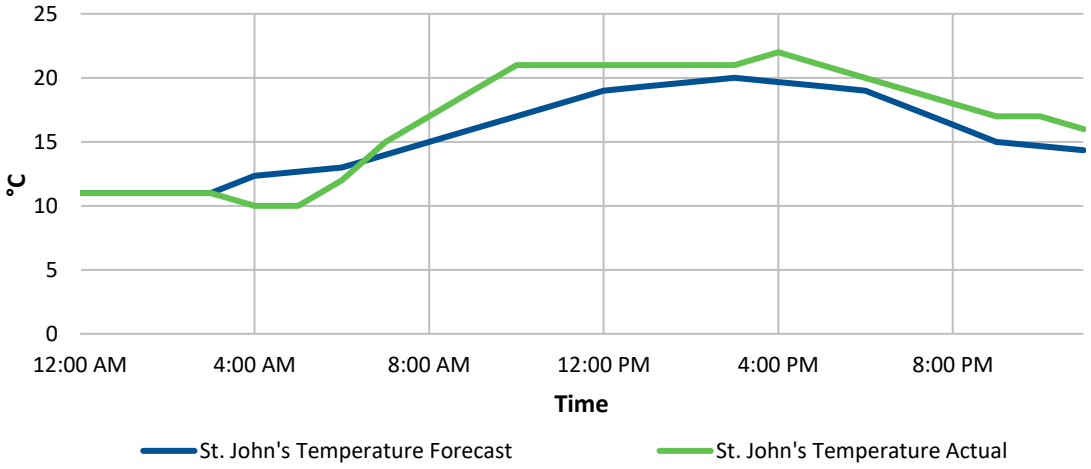

Chart 63: Forecast vs Actual Temperature for July 13, 2023

Chart 64 shows the actual wind speed in St. John's compared to the forecast. The wind speed was close to forecast the majority of the day.

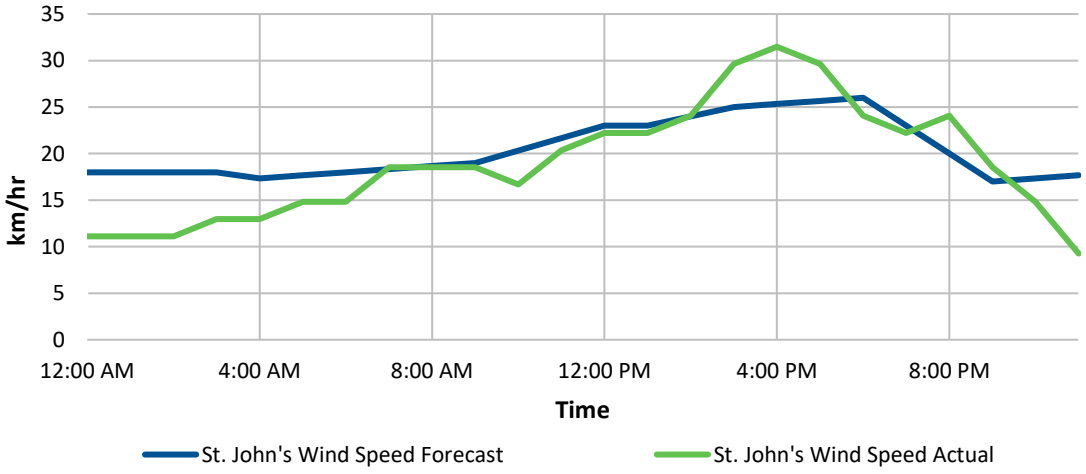

Chart 64: Forecast vs Actual Wind Speed for July 13, 2023

Chart 65 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

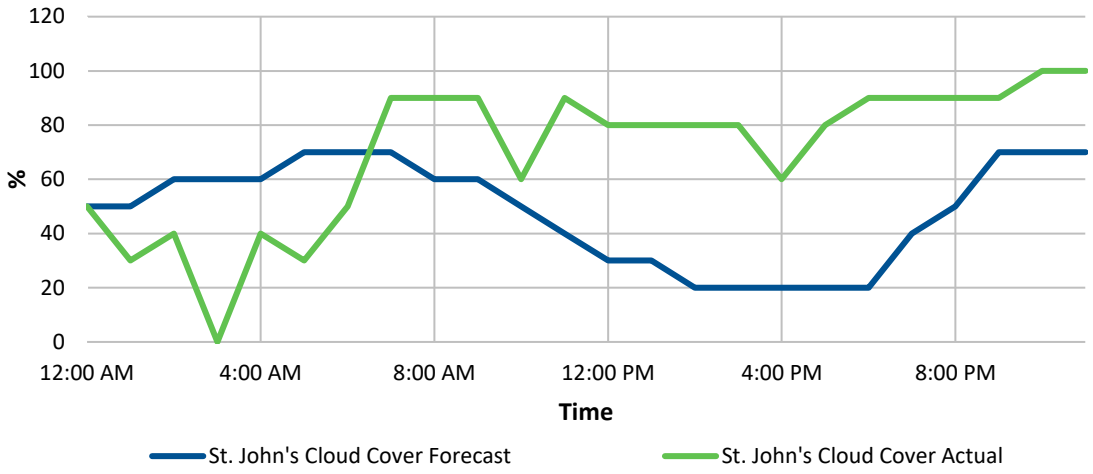

Chart 65: Forecast vs Actual Cloud Cover for July 13, 2023

In the 24 hours prior, the EMS was not recording actual data, which may have impacted the load forecast for this day. The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast.

2.3.6 September 2023

In September 2023, the forecast utility peak was 723 MW, which is consistent with the actual utility peak of 737 MW. Absolute error was 17 MW on average, with an average percent error of -1.0%, an average absolute error of 2.8%, and an average actual/forecast of -1.1%.

2.3.6.1 September 3, 2023

Table 14 provides a summary of forecast peak data for September 3, 2023.

Table 14: Peak Data Summary for September 3, 2023

	Load (MW)	Time	Error (%)[67]	Temperature Delta (°C)[68]	Wind Speed Delta (km/h)[69]
Utility Forecast	556	12:00 p.m.	6.9	2.00	2.00
Utility Actual	520	12:00 p.m.		2.00	2.00
Total Forecast	719	12:00 p.m.	9.3	2.00	2.00
Total Actual	658	12:00 p.m.		2.00	2.00
Board Forecast	890	N/A	N/A	N/A	N/A
Board Actual	918				

[67] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[68] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[69] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 890 MW; the actual reported peak was 918 MW. Chart 66 to Chart 70 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 66 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 12:00 p.m. peak of 719 MW; the actual peak was 658 MW, resulting in an overestimate of 9.3%.

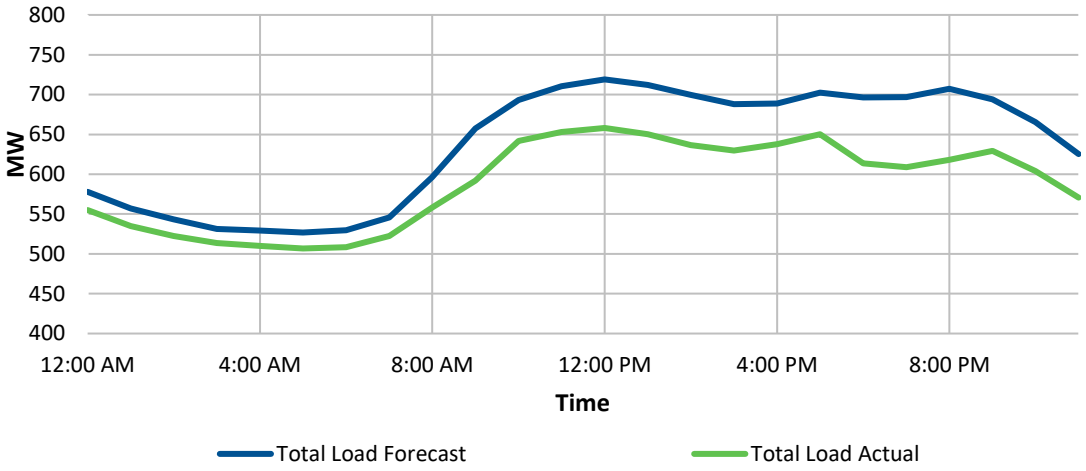

Chart 66: Forecast vs Actual Total Load for September 3, 2023

Chart 67 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 12:00 p.m. of 556 MW; the actual peak was 520 MW, resulting in an overestimate of 6.9%.

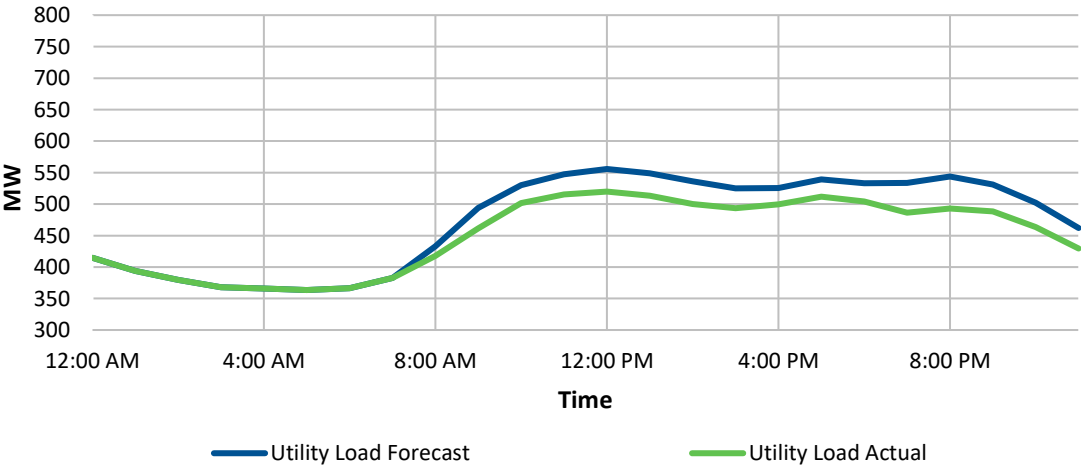

Chart 67: Forecast vs Actual Utility Load for September 3, 2023

Chart 68 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 2°C cooler in the hours leading up to peak. The difference in forecast and actual temperatures may have contributed to the forecast error, as the model may have incorporated some cooling load that did not materialize with the cooler temperatures.

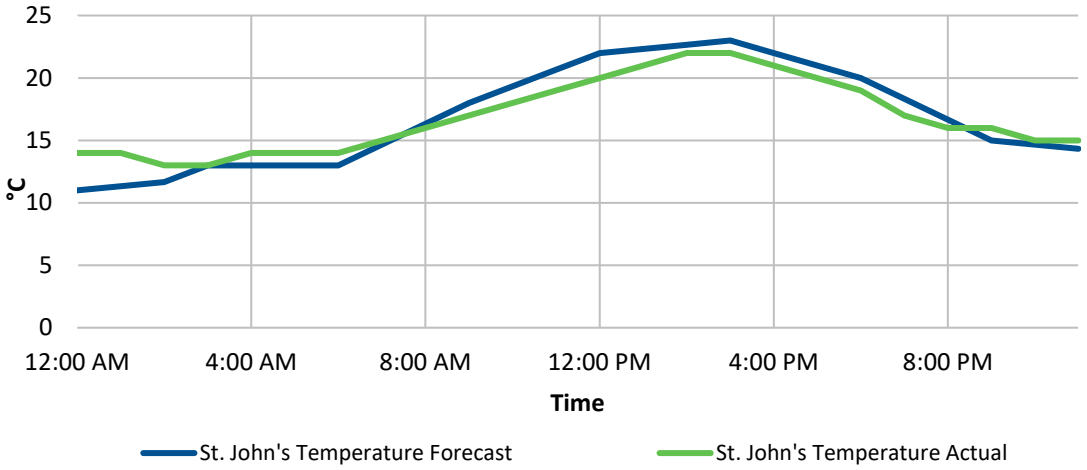

Chart 68: Forecast vs Actual Temperature for September 3, 2023

Chart 69 shows the actual wind speed in St. John's compared to the forecast. The wind speed was close to forecast the majority of the day.

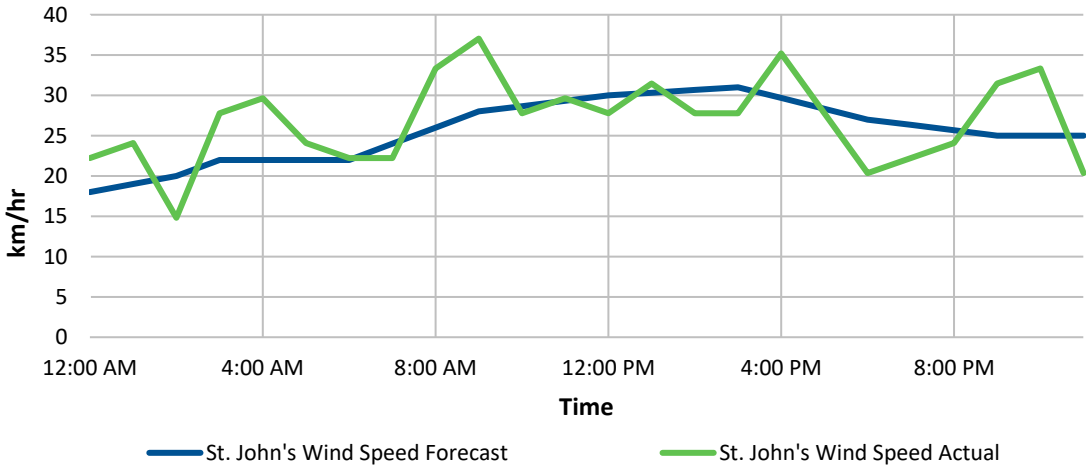

Chart 69: Forecast vs Actual Wind Speed for September 3, 2023

Chart 70 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

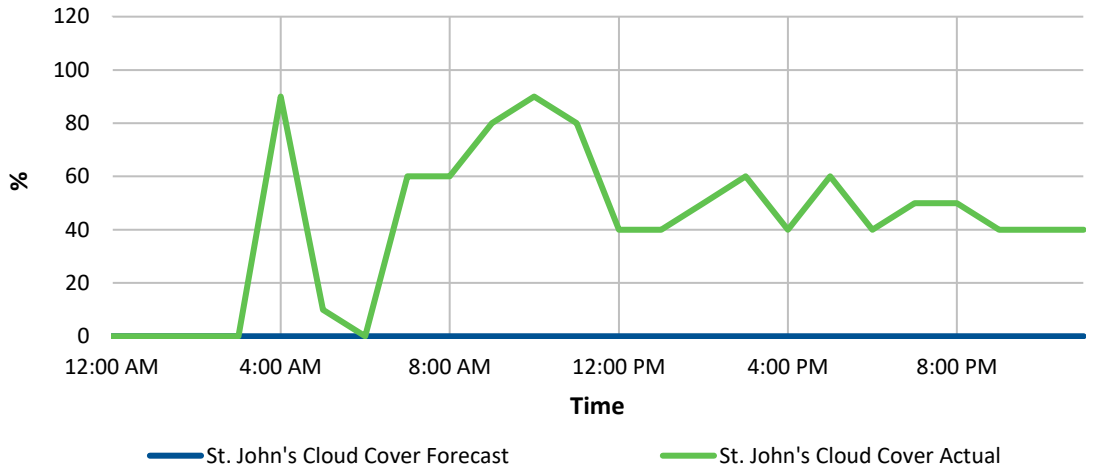

Chart 70: Forecast vs Actual Cloud Cover for September 3, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast. Additionally this was Labour Day weekend, which may have resulted in non-uniform customer behaviour, further contributing to the forecast error.

2.3.6.2 September 19, 2023

Table 15 provides a summary of forecast peak data for September 19, 2023.

Table 15: Peak Data Summary for September 19, 2023

	Load (MW)	Time	Error (%)[70]	Temperature Delta (°C)[71]	Wind Speed Delta (km/h)[72]
Utility Forecast	597	5:00 p.m.	-5.7	1.00	(2.00)
Utility Actual	633	5:00 p.m.		1.00	(2.00)
Total Forecast	761	5:00 p.m.	-0.2	1.00	(2.00)
Total Actual	762	5:00 p.m.		1.00	(2.00)
Board Forecast	765	N/A	N/A	N/A	N/A
Board Actual	766				

[70] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[71] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[72] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 765 MW; the actual reported peak was 766 MW. Chart 71 to Chart 75 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 71 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 761 MW; the actual peak was 762 MW, resulting in an underestimate of 0.2%.

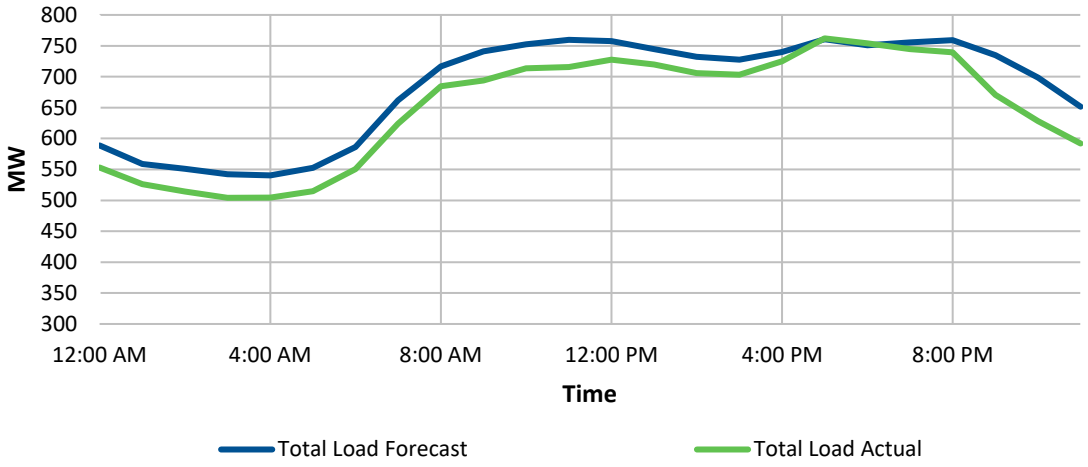

Chart 71: Forecast vs Actual Total Load for September 19, 2023

Chart 72 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 597 MW; the actual peak was 633 MW, resulting in an underestimate of 5.7%.

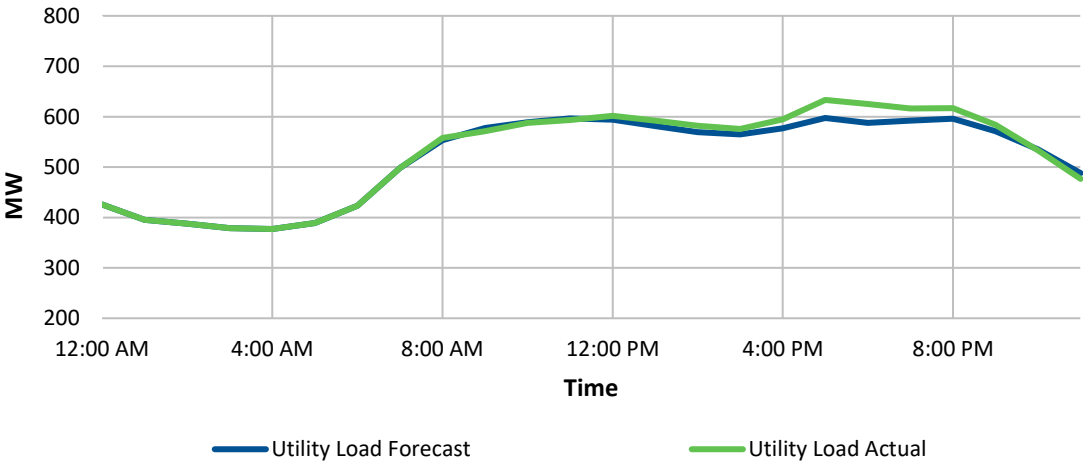

Chart 72: Forecast vs Actual Utility Load for September 19, 2023

Chart 73 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 1°C to 2°C cooler in the hours leading up to peak. The difference in forecast and actual temperatures may have contributed to the forecast error.

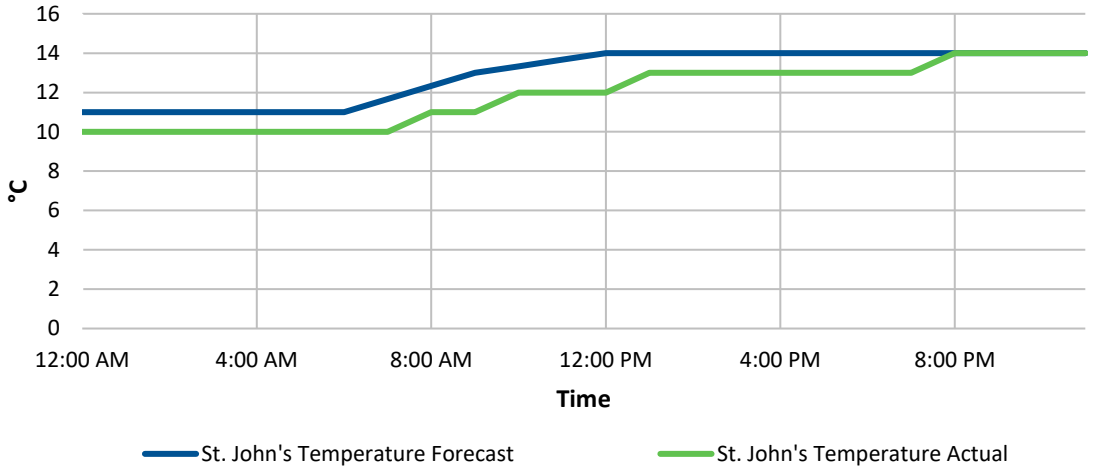

Chart 73: Forecast vs Actual Temperature for September 19, 2023

Chart 74 shows the actual wind speed in St. John's compared to the forecast. The wind speed was close to forecast the majority of the day.

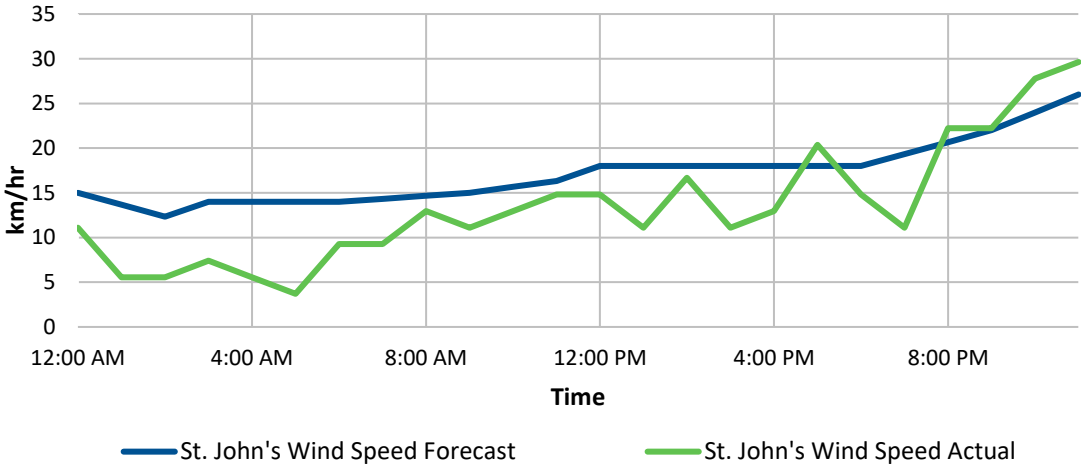

Chart 74: Forecast vs Actual Wind Speed for September 19, 2023

Chart 75 shows the actual cloud cover in St. John's compared to the forecast. Cloud cover was slightly less than forecast for the majority of the day.

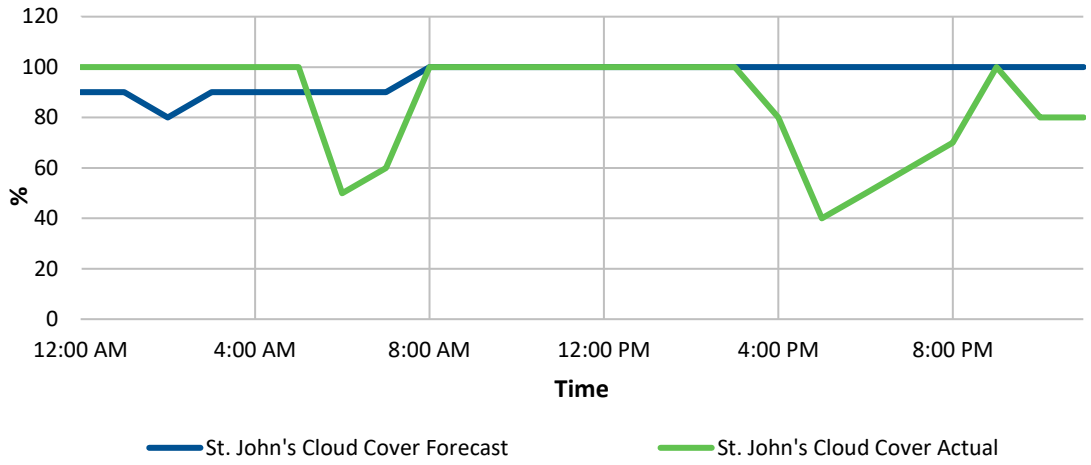

Chart 75: Forecast vs Actual Cloud Cover for September 19, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the temperature variations from the forecast.

2.3.6.3 September 28, 2023

Table 16 provides a summary of forecast peak data for September 28, 2023.

Table 16: Peak Data Summary for September 28, 2023

	Load (MW)	Time	Error (%)[73]	Temperature Delta (°C)[74]	Wind Speed Delta (km/h)[75]
Utility Forecast	686	8:00 p.m.	6.2	2.00	9.00
Utility Actual	646	8:00 a.m.		1.00	2.00
Total Forecast	849	8:00 p.m.	9.6	2.00	9.00
Total Actual	775	8:00 p.m.		2.00	9.00
Board Forecast	1,215	N/A	N/A	N/A	N/A
Board Actual	1,135				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,215 MW; the actual reported peak was 1,135 MW. Chart 76 to Chart 80 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[73] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[74] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[75] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 76 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted an 8:00 p.m. peak of 849 MW; the actual peak was 775 MW, resulting in an overestimate of 9.6%.

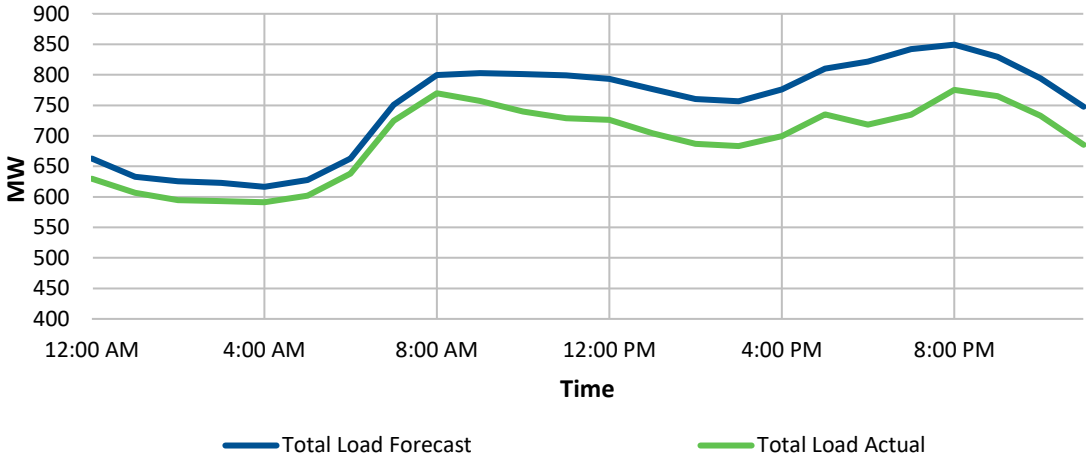

Chart 76: Forecast vs Actual Total Load for September 28, 2023

Chart 77 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 8:00 p.m. of 686 MW; the actual peak was 646 MW and occurred at 8:00 a.m., resulting in an overestimate of 6.2%. The forecast load at the time of peak was 636 MW, resulting in an underestimate of less than 2% at time of peak.

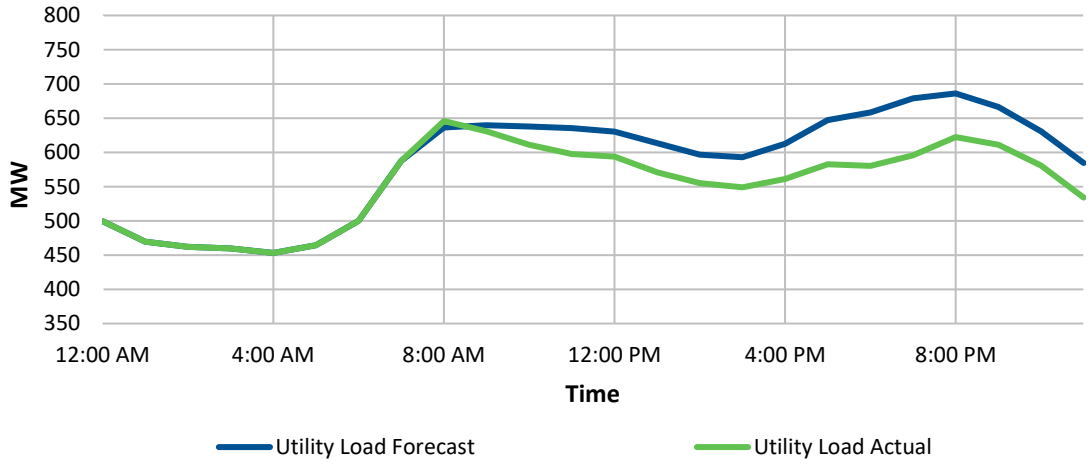

Chart 77: Forecast vs Actual Utility Load for September 28, 2023

Chart 78 shows the actual temperature in St. John's compared to the forecast. The temperature was on average 1°C to 2°C cooler in the hours leading up to the actual peak.

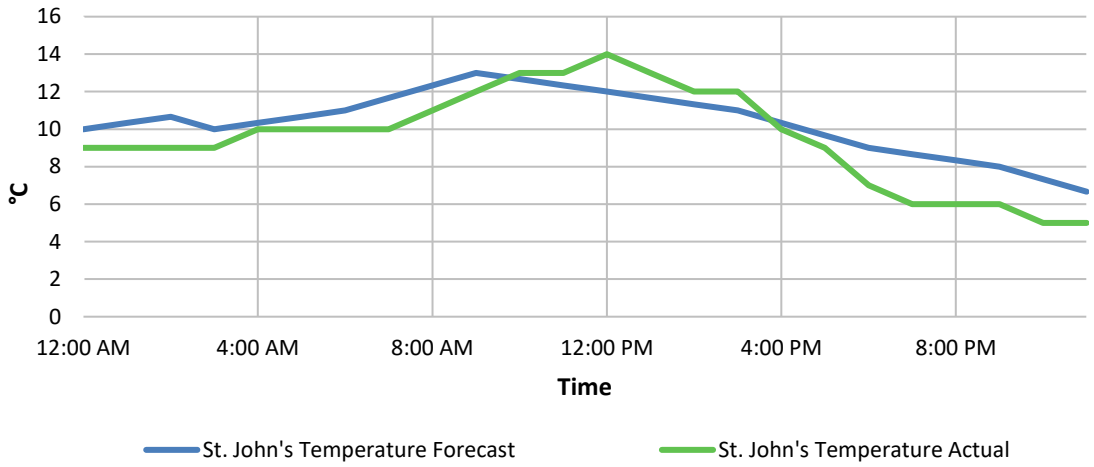

Chart 78: Forecast vs Actual Temperature for September 28, 2023

1 Chart 79 shows the actual wind speed in St. John's compared to the forecast. The wind speed was
2 slightly less than forecast the majority of the day.

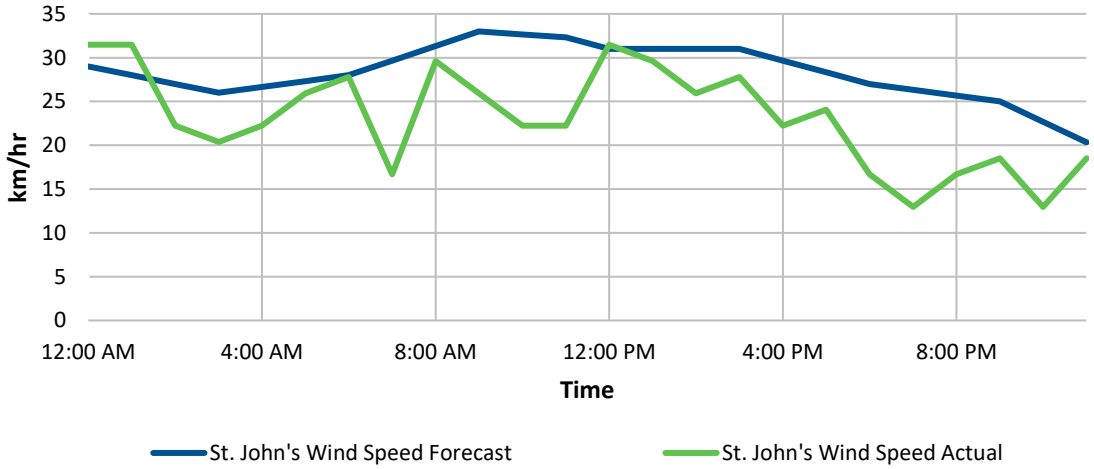

Chart 79: Forecast vs Actual Wind Speed for September 28, 2023

3 Chart 80 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than
4 forecast for the majority of the day.

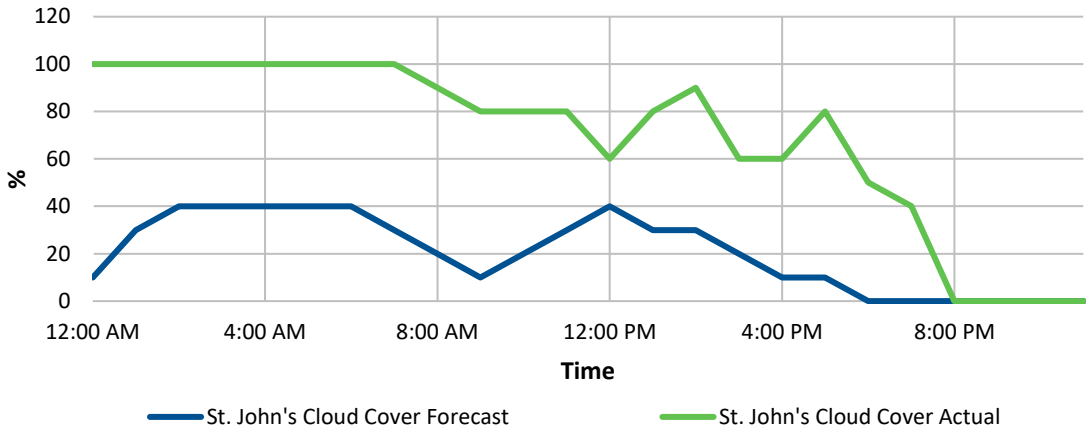

Chart 80: Forecast vs Actual Cloud Cover for September 28, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the forecast model more heavily weighting the previous day's load when developing the current day forecast. The utility load and weather conditions on September 27, 2023 were comparable to the forecast values for September 28, 2023.

2.3.7 October 2023

In October 2023, the forecast utility peak was 946 MW, which is consistent with the actual utility peak of 937 MW. Absolute error for the month was 17 MW on average, with an average percent error of -1.0%, an average absolute error of 2.4%, and an average actual/forecast of -1.1%.

2.3.7.1 October 16, 2023

Table 17 provides a summary of forecast peak data for October 16, 2023.

Table 17: Peak Data Summary for October 16, 2023

	Load (MW)	Time	Error (%)[76]	Temperature Delta (°C)[77]	Wind Speed Delta (km/h)[78]
Utility Forecast	688	7:00 p.m.	-10.3	2.00	3.00
Utility Actual	767	5:00 p.m.		2.00	(13.00)
Total Forecast	851	7:00 p.m.	-5.8	2.00	3.00
Total Actual	904	5:00 p.m.		2.00	(13.00)
Board Forecast	1,110	N/A	N/A	N/A	N/A
Board Actual	1,190				

[76] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[77] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[78] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,110 MW; the actual reported peak was 1,190 MW. Chart 81 to Chart 85 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 81 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 7:00 p.m. peak of 851 MW; the actual peak was 904 MW and occurred at 5:00 p.m., resulting in an underestimate of 5.8%. The forecast load at the time of peak was 826 MW.

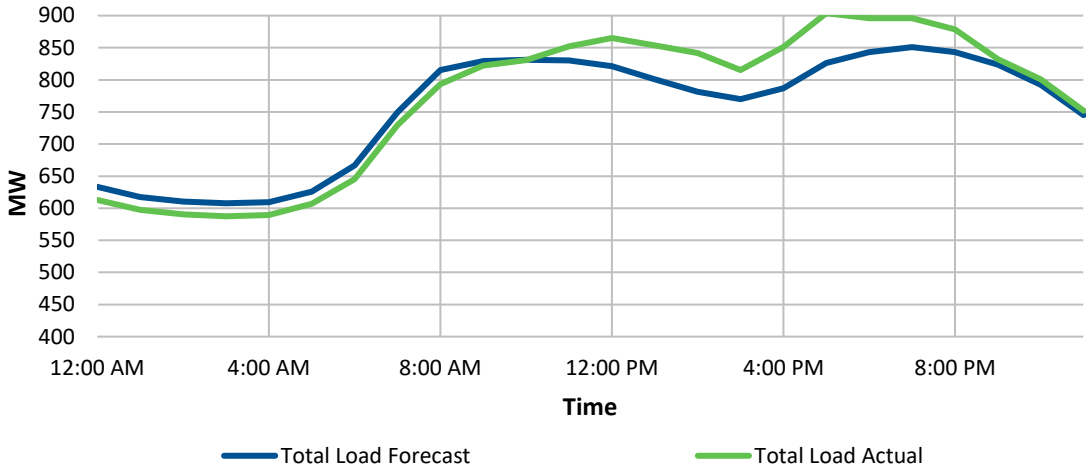

Chart 81: Forecast vs Actual Total Load for October 16, 2023

Chart 82 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 7:00 p.m. of 688 MW; the actual peak was 767 MW and occurred at 5:00 p.m., resulting in an underestimate of 10.3%. The forecast load at the time of peak was 663 MW.

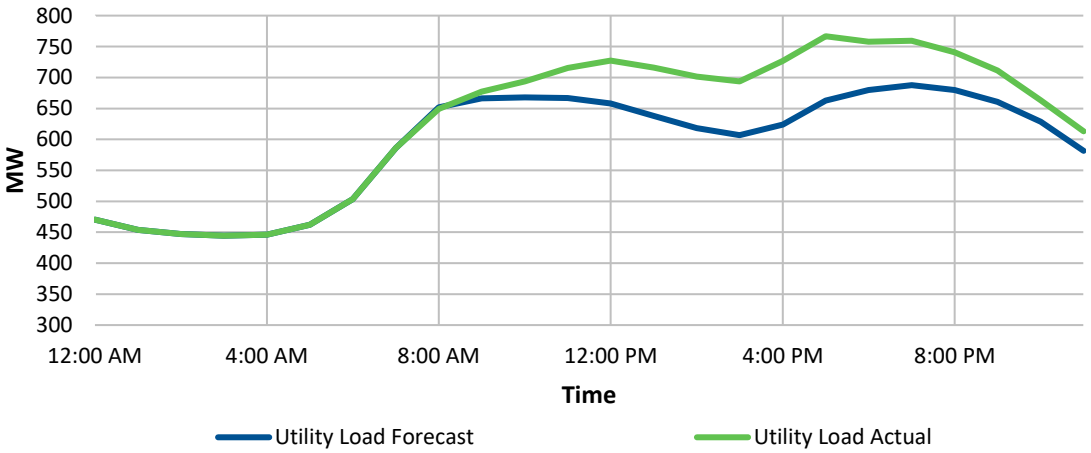

Chart 82: Forecast vs Actual Utility Load for October 16, 2023

Chart 83 shows the actual temperature in St. John's compared to the forecast. In the hours leading up to the actual peak, the temperature was on average 2°C cooler, which may have contributed to the forecast error.

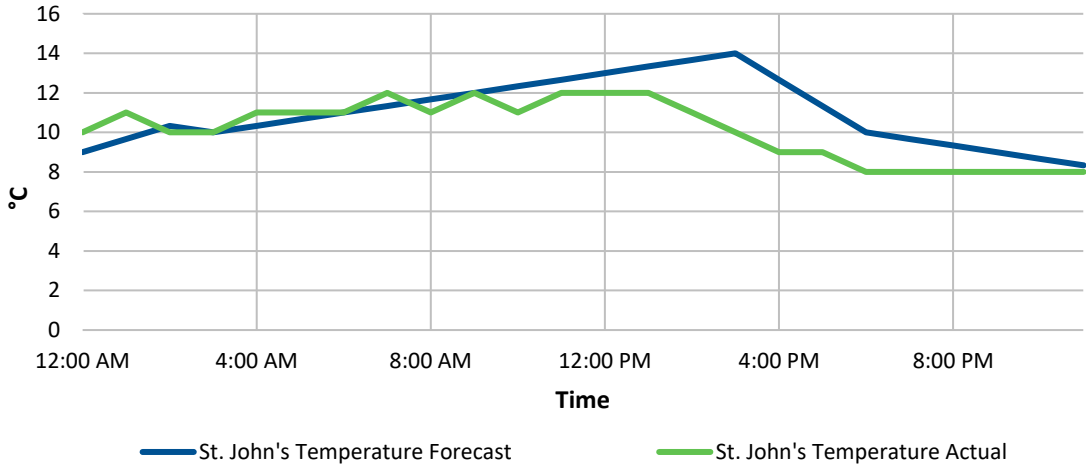

Chart 83: Forecast vs Actual Temperature for October 16, 2023

Chart 84 shows the actual wind speed in St. John's compared to the forecast. The wind speed was higher than forecast in the hours leading up to the actual peak, which may have contributed to the forecast error.

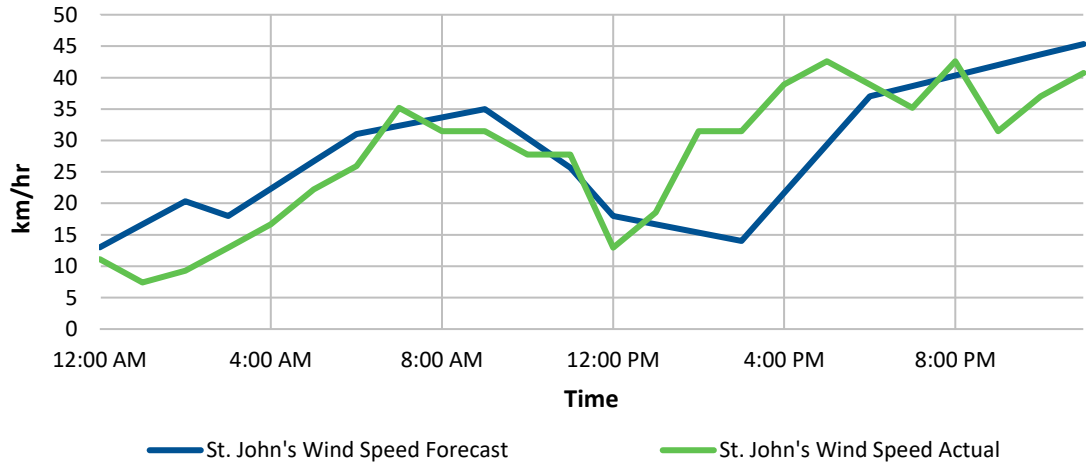

Chart 84: Forecast vs Actual Wind Speed for October 16, 2023

Chart 85 shows the actual cloud cover in St. John's compared to the forecast. It was less cloudy than forecast for the majority of the day.

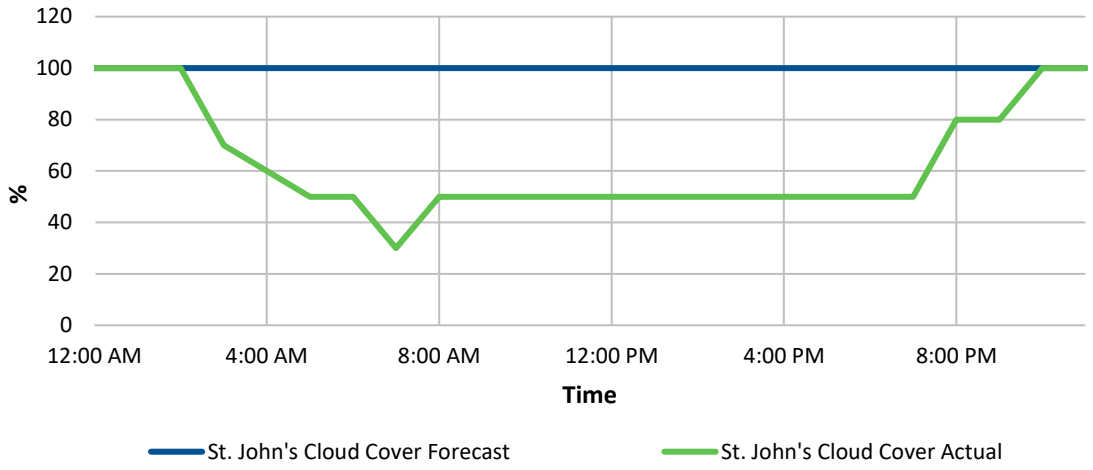

Chart 85: Forecast vs Actual Cloud Cover for October 16, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to the weather variations from the forecast.

2.3.7.2 October 21, 2023

Table 18 provides a summary of forecast peak data for October 21, 2023.

Table 18: Peak Data Summary for October 21, 2023

	Load (MW)	Time	Error (%)[79]	Temperature Delta (°C)[80]	Wind Speed Delta (km/h)[81]
Utility Forecast	668	6:00 p.m.	-7.3	0.00	11.00
Utility Actual	721	5:00 p.m.		0.00	(7.00)
Total Forecast	832	6:00 p.m.	-2.3	0.00	11.00
Total Actual	851	5:00 p.m.		0.00	(7.00)
Board Forecast	1,215	N/A	N/A	N/A	N/A
Board Actual	1,235				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,215 MW; the actual reported peak was 1,235 MW. Chart 86 to Chart 90 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[79] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[80] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[81] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 86 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 6:00 p.m. peak of 832 MW; the actual peak was 851 MW and occurred at 5:00 p.m., resulting in an underestimate of 2.3%. The forecast load at the time of peak was 813 MW.

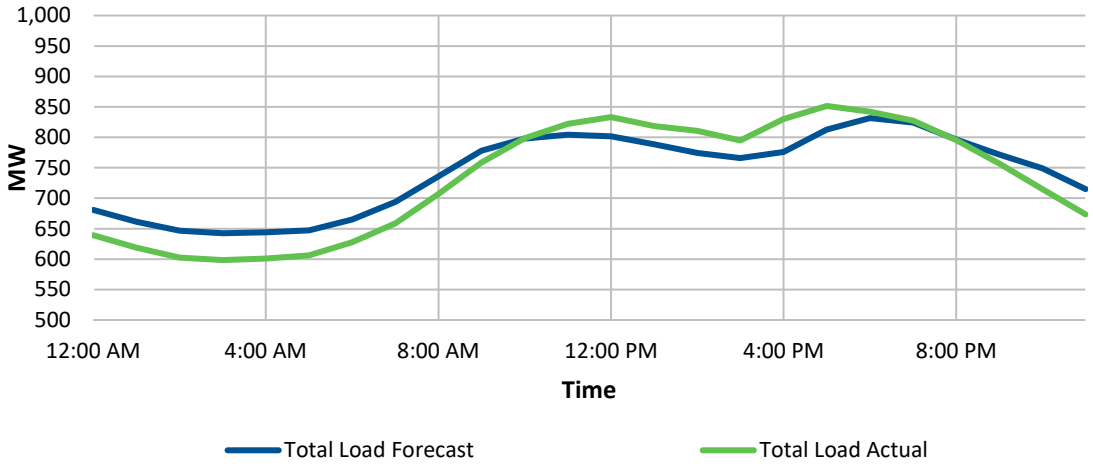

Chart 86: Forecast vs Actual Total Load for October 21, 2023

Chart 87 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 6:00 p.m. of 668 MW; the actual peak was 721 MW and occurred at 5:00 p.m., resulting in an underestimate of 7.3%. The forecast load at the time of peak was 649 MW.

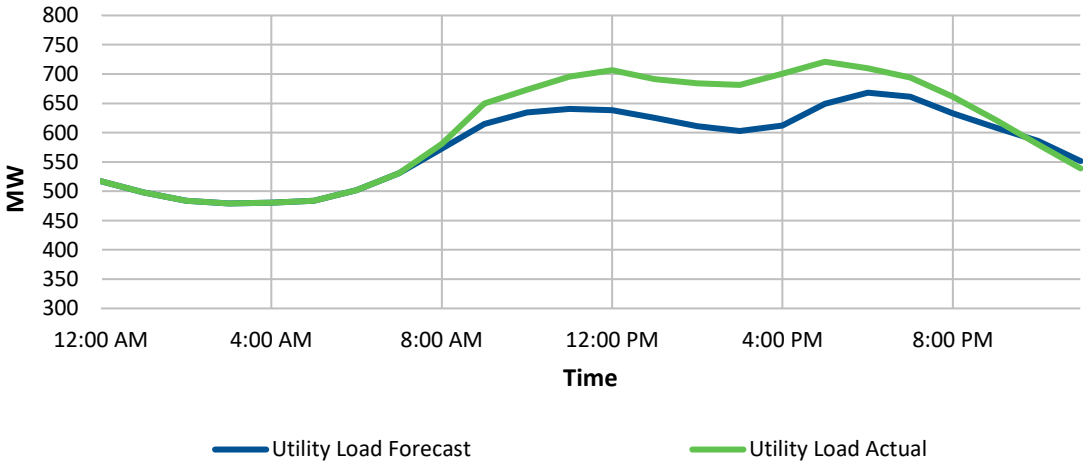

Chart 87: Forecast vs Actual Utility Load for October 21, 2023

Chart 88 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast for the majority of the day and is not thought to have contributed to the forecast error.

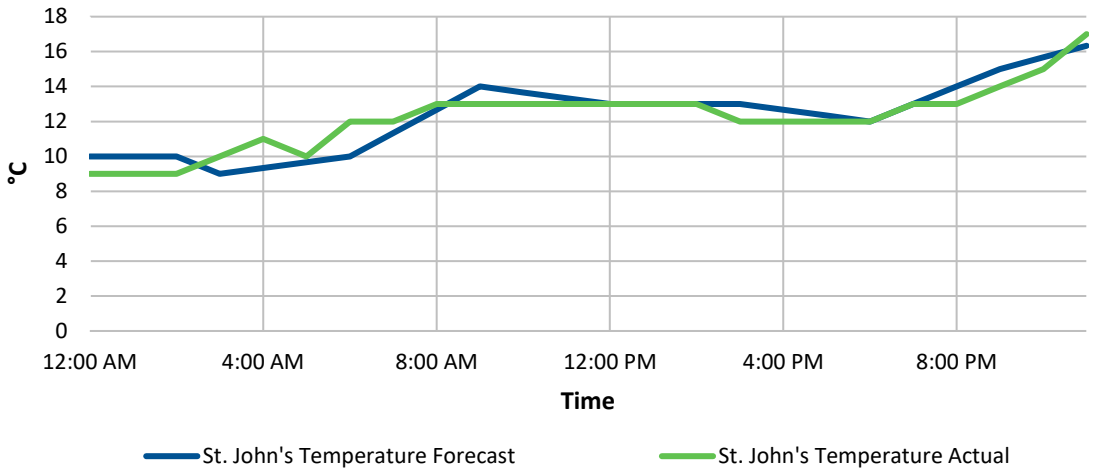

Chart 88: Forecast vs Actual Temperature for October 21, 2023

1 Chart 89 shows the actual wind speed in St. John's compared to the forecast. The wind speed was higher
2 than forecast in the hours leading up to the actual peak.

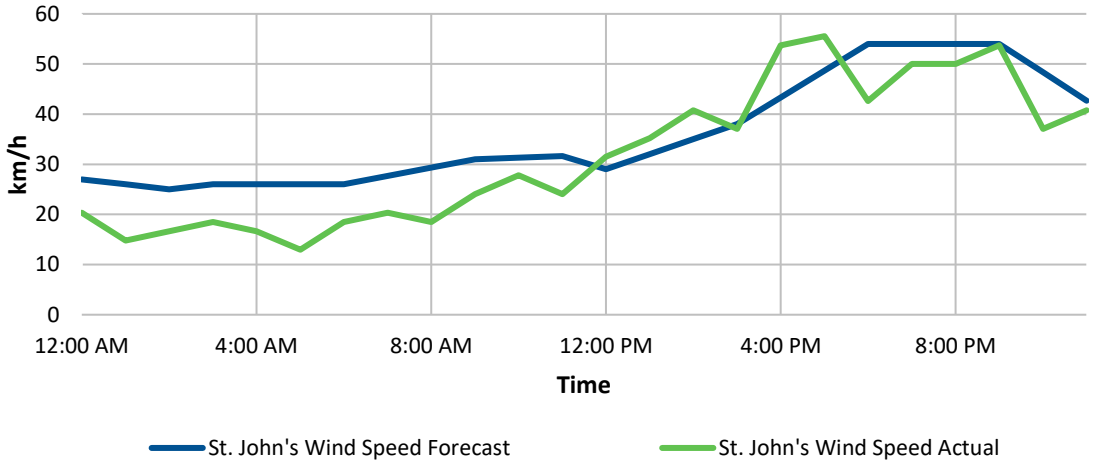

Chart 89: Forecast vs Actual Wind Speed for October 21, 2023

3 Chart 90 shows the actual cloud cover in St. John's compared to the forecast. Cloud cover was close to
4 forecast for the day.

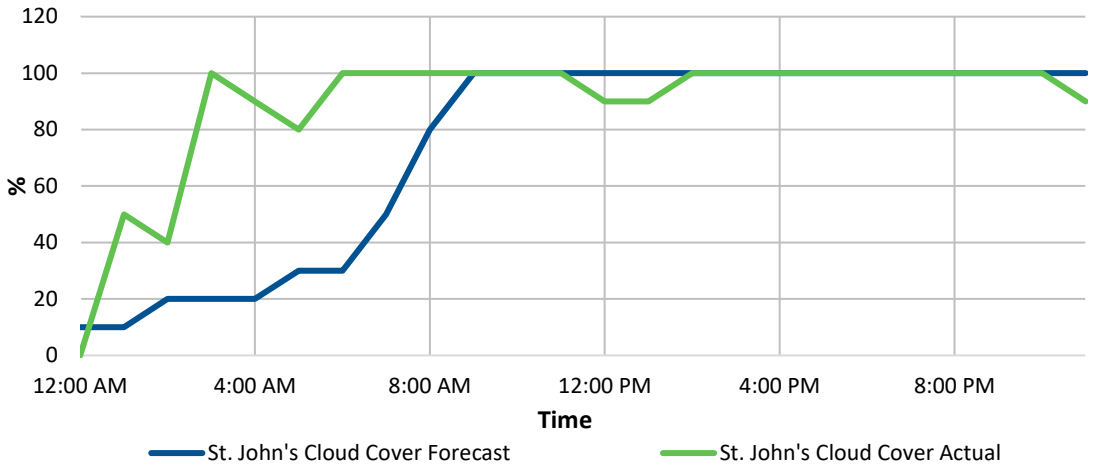

Chart 90: Forecast vs Actual Cloud Cover for October 21, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour as this day fell on a Saturday.

2.3.7.3 October 22, 2023

Table 19 provides a summary of forecast peak data for October 22, 2023.

Table 19: Peak Data Summary for October 22, 2023

	Load (MW)	Time	Error (%)[82]	Temperature Delta (°C)[83]	Wind Speed Delta (km/h)[84]
Utility Forecast	646	7:00 p.m.	-6.5	1.00	9.00
Utility Actual	691	5:00 p.m.		0.00	11.00
Total Forecast	809	7:00 p.m.	-2.5	1.00	9.00
Total Actual	830	5:00 p.m.		0.00	11.00
Board Forecast	1,180	N/A	N/A	N/A	N/A
Board Actual	1,200				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,180 MW; the actual reported peak was 1,200 MW. Chart 91 to Chart 95 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[82] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[83] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[84] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 91 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 7:00 p.m. peak of 809 MW; the actual peak was 830 MW and occurred at 5:00 p.m., resulting in an underestimate of 2.5%. The forecast load at the time of peak was 792 MW.

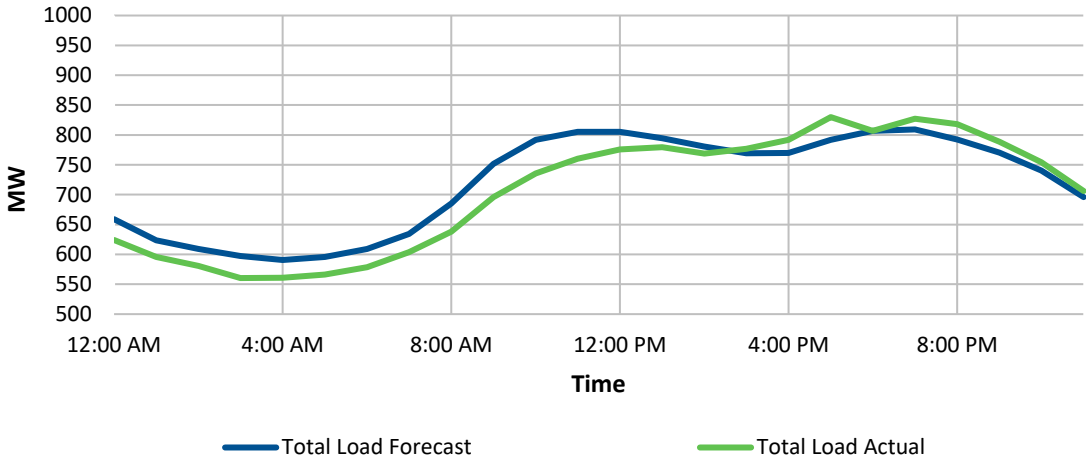

Chart 91: Forecast vs Actual Total Load for October 22, 2023

Chart 92 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 7:00 p.m. of 646 MW; the actual peak was 691 MW and occurred at 5:00 p.m., resulting in an underestimate of 6.5%. The forecast load at the time of peak was 629 MW.

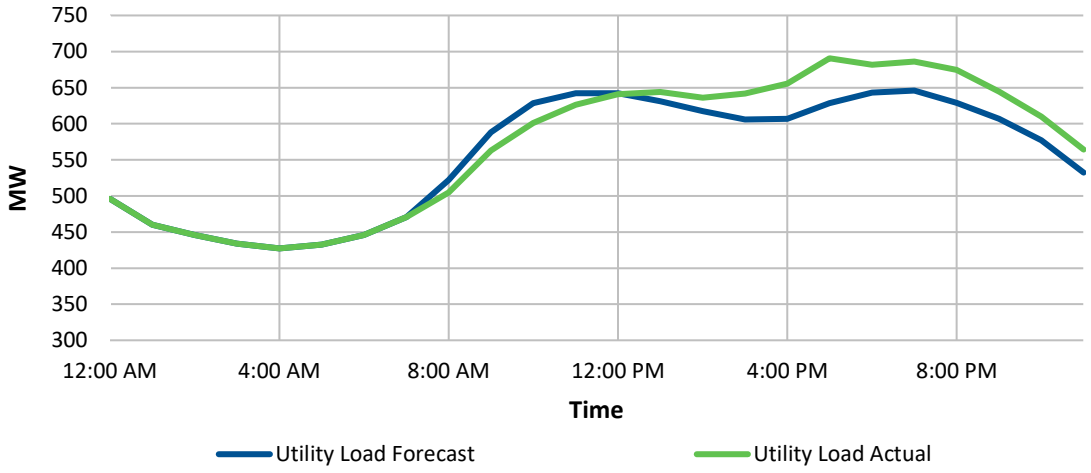

Chart 92: Forecast vs Actual Utility Load for October 22, 2023

Chart 93 shows the actual temperature in St. John's compared to the forecast. The temperature was 1°C to 2°C warmer in the first part of the day;[85] however, this should not haven contributed to forecast error.

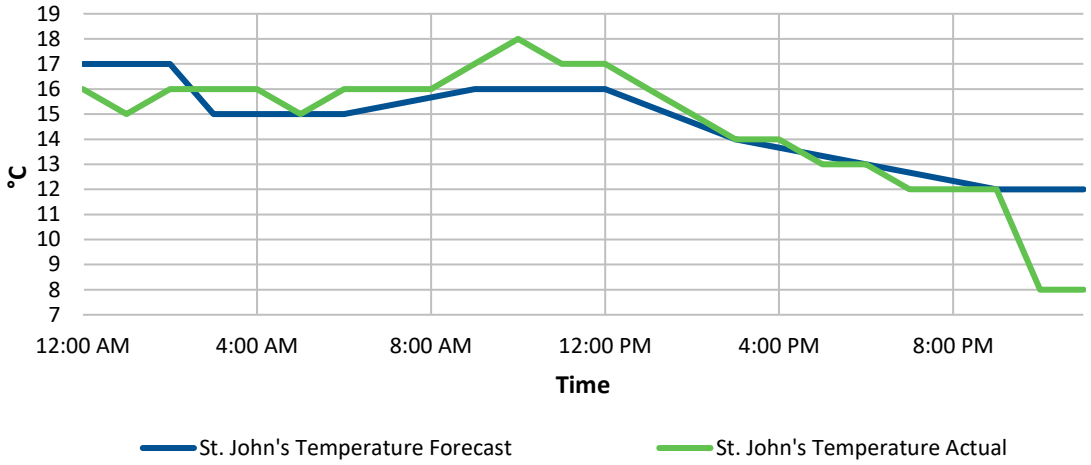

Chart 93: Forecast vs Actual Temperature for October 22, 2023

Chart 94 shows the actual wind speed in St. John's compared to the forecast. The wind speed was less than forecast in the hours leading up to the actual peak.

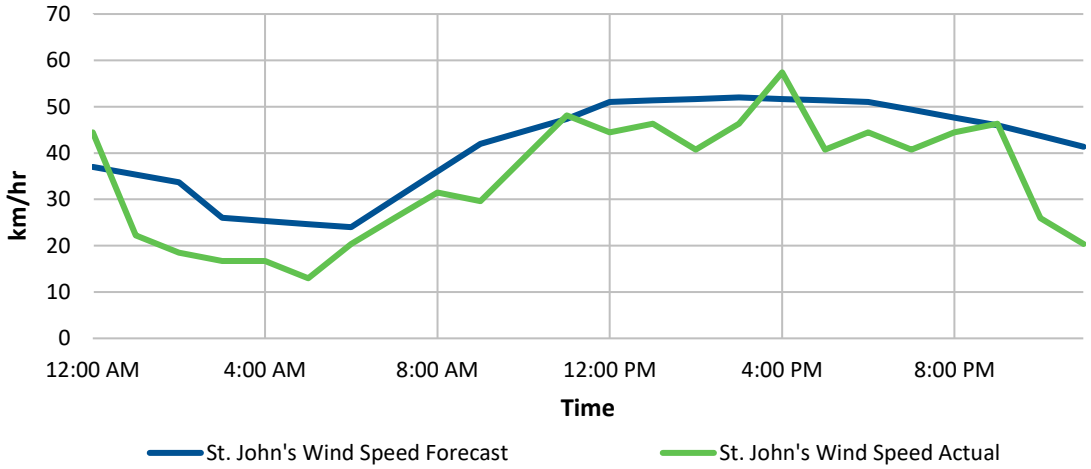

Chart 94: Forecast vs Actual Wind Speed for October 22, 2023

Chart 95 shows the actual cloud cover in St. John's compared to the forecast. It was slightly cloudier than forecast.

[85] The first part of the day is from 3:00 a.m. to 1:00 p.m.

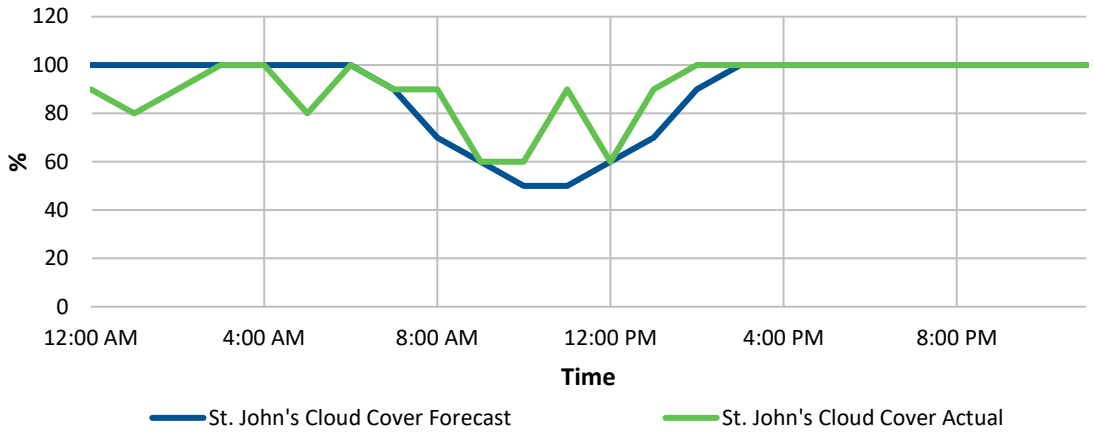

Chart 95: Forecast vs Actual Cloud Cover for October 22, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour as this day fell on a Sunday.

2.3.8 November 2023

In November 2023, the forecast utility peak was 1,151 MW on November 25, 2023, which is consistent with the actual utility peak for that day of 1,137 MW. The actual utility peak of 1.154 MW occurred on November 30, 2023 and was consistent with the forecast utility peak for that day of 1,148 MW. Absolute error for the month was 18 MW on average, with an average percent error of -0.2%, an average absolute error of 1.8%, and an average actual/forecast of -0.2%.

2.3.8.1 November 6, 2023

Table 20 provides a summary of forecast peak data for November 6, 2023.

Table 20: Peak Data Summary for November 6, 2023

	Load (MW)	Time	Error (%)[86]	Temperature Delta (°C)[87]	Wind Speed Delta (km/h)[88]
Utility Forecast	1,036	6:00 p.m.	5.6	1.00	1.00
Utility Actual	982	7:00 p.m.		1.00	11.00
Total Forecast	1,199	6:00 p.m.	6.7	1.00	1.00
Total Actual	1,124	7:00 p.m.		1.00	11.00
Board Forecast	1,450	N/A	N/A	N/A	N/A
Board Actual	1,375				

[86] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[87] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[88] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,450 MW; the actual reported peak was 1,375 MW. Chart 96 to Chart 100 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 96 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 6:00 p.m. peak of 1,199 MW; the actual peak was 1,124 MW and occurred at 7:00 p.m., resulting in an overestimate of 6.7%. The forecast load at the time of peak was 1,177 MW.

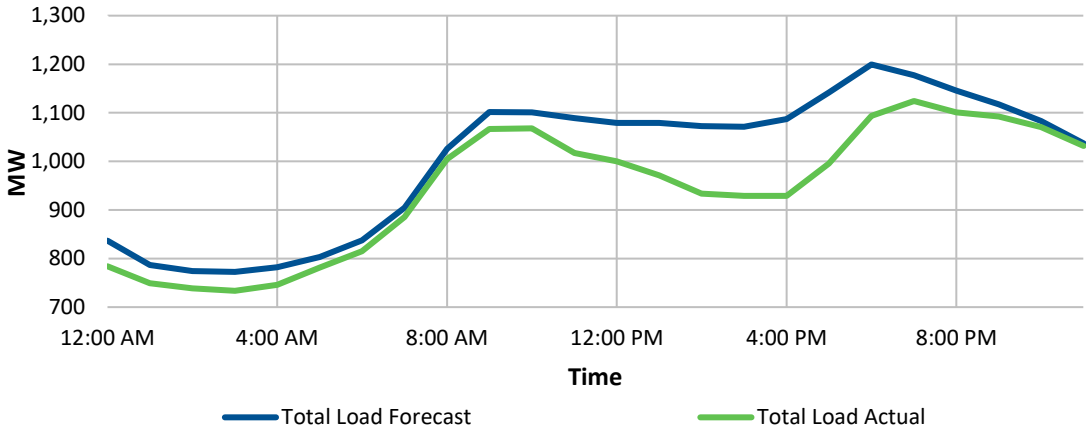

Chart 96: Forecast vs Actual Total Load for November 6, 2023

Chart 97 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 6:00 p.m. of 1,036 MW; the actual peak was 982 MW and occurred at 7:00 p.m., resulting in an overestimate of 5.6%. The forecast load at the time of peak was 1,014 MW, resulting in an overestimate of 3.3%.

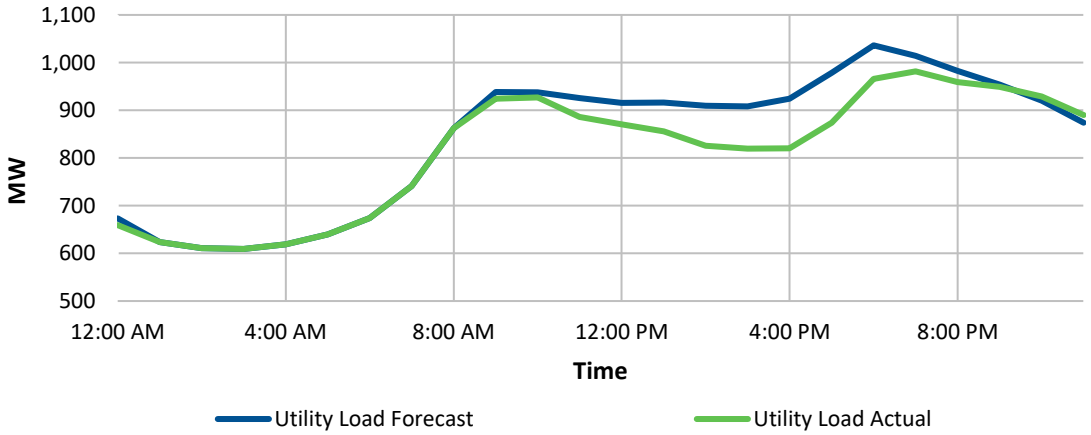

Chart 97: Forecast vs Actual Utility Load for November 6, 2023

Chart 98 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast for the majority of the day.

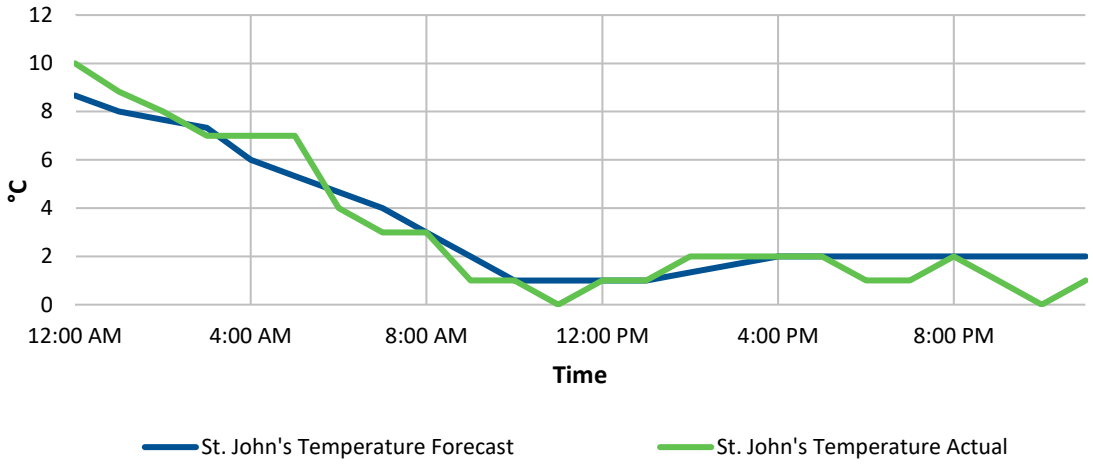

Chart 98: Forecast vs Actual Temperature for November 6, 2023

Chart 99 shows the actual wind speed in St. John's compared to the forecast. The wind speed was less than forecast for the majority of the day, which may have contributed to the forecast error.

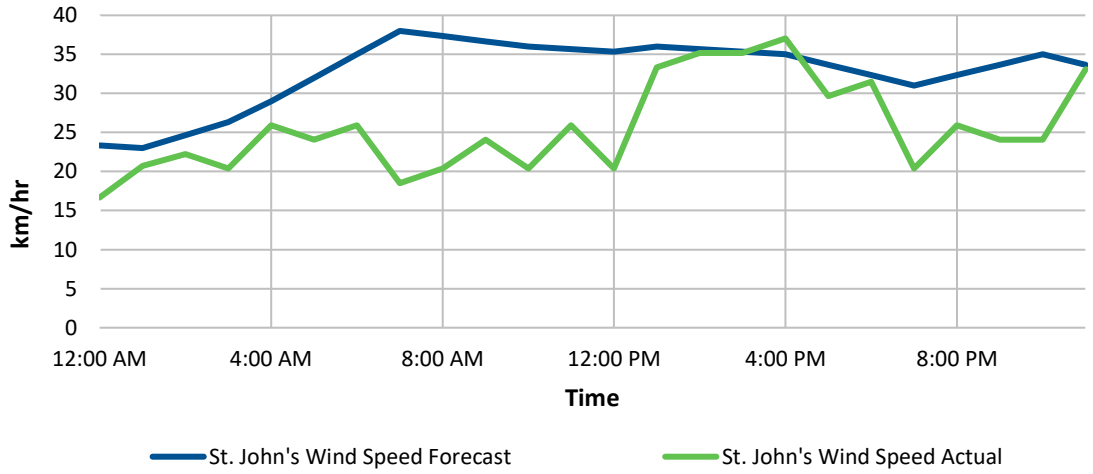

Chart 99: Forecast vs Actual Wind Speed for November 6, 2023

Chart 100 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

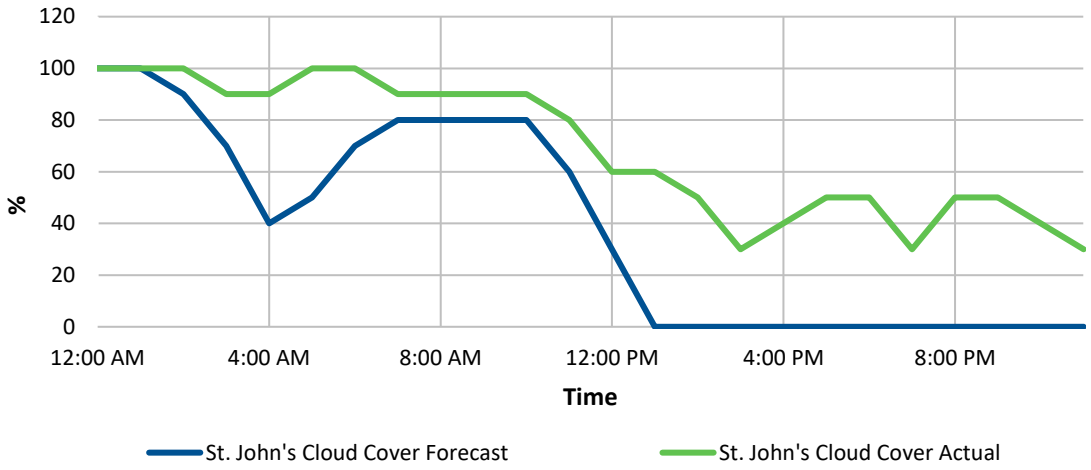

Chart 100: Forecast vs Actual Cloud Cover for November 6, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to variations in the wind speed compared to forecast. Additionally, the weather on the previous day (November 5, 2023) was considerably warmer so heating load may have been less due to houses being warmer than expected.

2.3.8.2 November 26, 2023

Table 21 provides a summary of forecast peak data for November 26, 2023.

Table 21: Peak Data Summary for November 26, 2023

	Load (MW)	Time	Error (%)[89]	Temperature Delta (°C)[90]	Wind Speed Delta (km/h)[91]
Utility Forecast	1,072	10:00 a.m.	-5.3	(2.00)	6.00
Utility Actual	1,131	6:00 p.m.		1.00	9.00
Total Forecast	1,147	10:00 a.m.	-3.5	(2.00)	6.00
Total Actual	1,189	6:00 p.m.		1.00	9.00
Board Forecast	1,375	N/A	N/A	N/A	N/A
Board Actual	1,417				

[89] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[90] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[91] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,375 MW; the actual reported peak was 1,417 MW. Chart 101 to Chart 105 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 101 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 10:00 a.m. peak of 1,147 MW; the actual peak was 1,189 MW and occurred at 6:00 p.m., resulting in an underestimate of 3.5%. The forecast load at the time of peak was 1,107 MW.

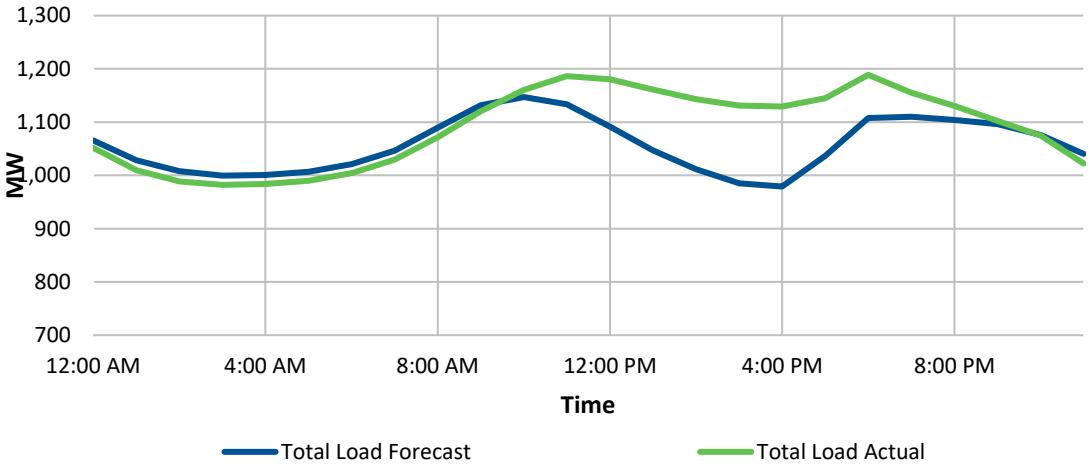

Chart 101: Forecast vs Actual Total Load for November 26, 2023

Chart 102 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 10:00 a.m. of 1,072 MW; the actual peak was 1,131 MW and occurred at 6:00 p.m., resulting in an underestimate of 5.3%. The forecast load at the time of peak was 1,032 MW.

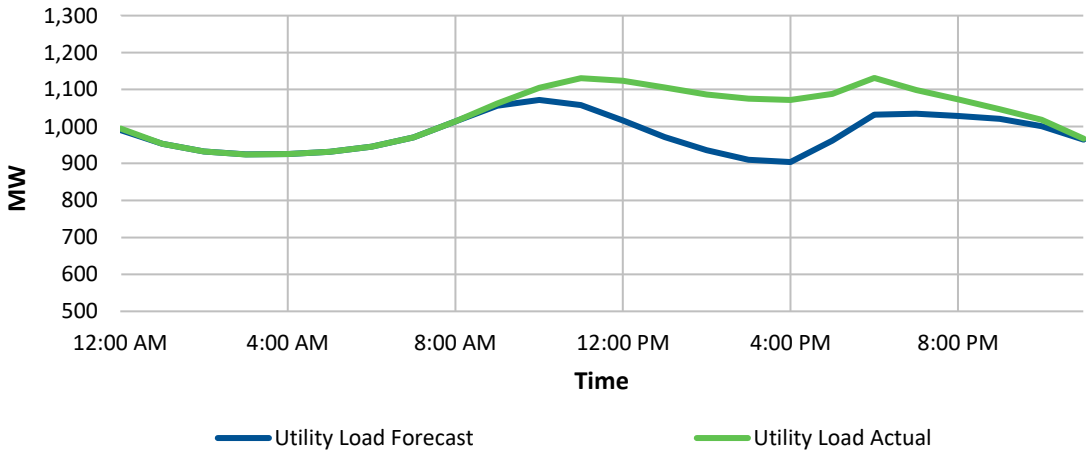

Chart 102: Forecast vs Actual Utility Load for November 26, 2023

Chart 103 shows the actual temperature in St. John's compared to the forecast. The temperature was 2°C warmer at the time of the forecasted peak and 1°C cooler at and leading up to the actual peak, which may have contributed to the forecast error and shifted the peak to the evening.

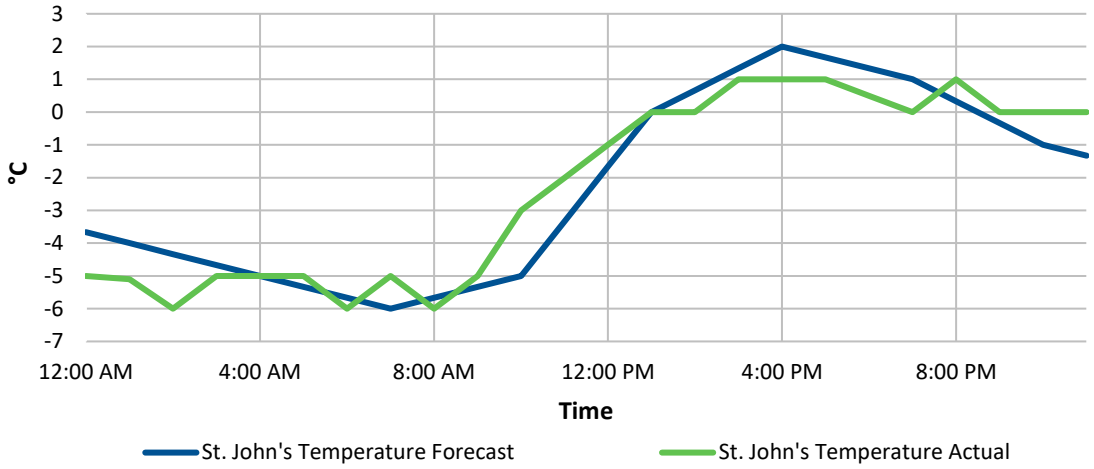

Chart 103: Forecast vs Actual Temperature for November 26, 2023

Chart 104 shows the actual wind speed in St. John's compared to the forecast. The wind speed was close to forecast for the majority of the day.

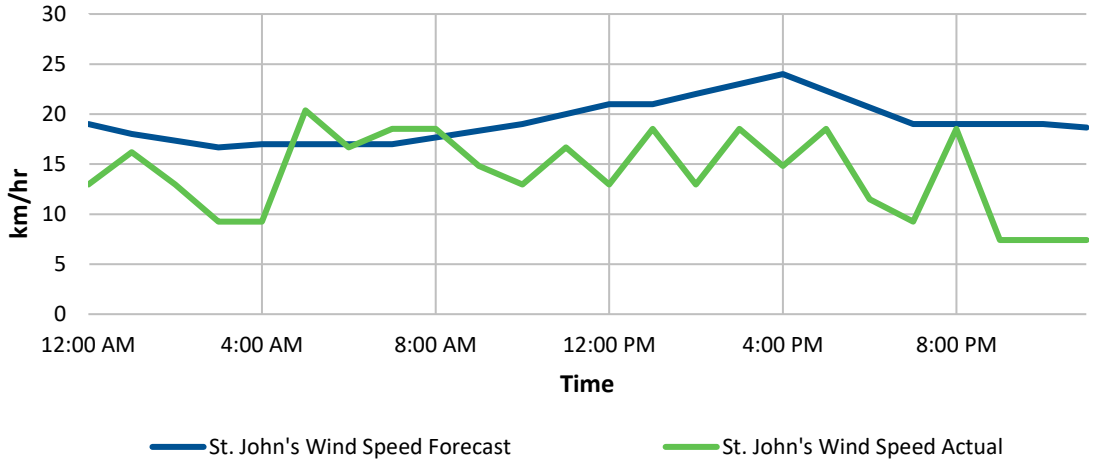

Chart 104: Forecast vs Actual Wind Speed for November 26, 2023

Chart 105 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the day.

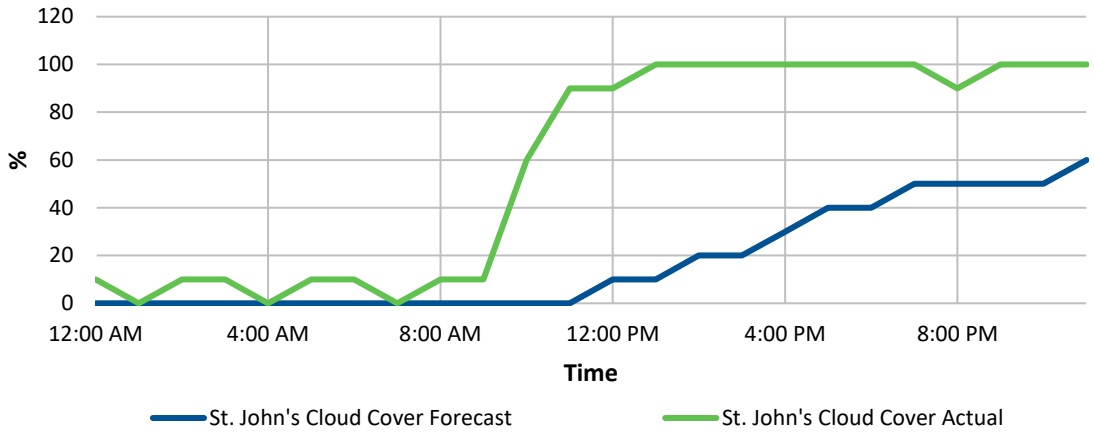

Chart 105: Forecast vs Actual Cloud Cover for November 26, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed the temperature variations from the forecast.

2.3.9 December 2023

In December 2023, the forecast utility peak was 1,304 MW, which is 4.9% higher than the actual utility peak for that day of 1,243 MW. The actual utility peak of 1,308 MW occurred on December 29, 2023 and was 1.2% higher than the forecast utility peak for that day of 1,293 MW. Absolute error for the month was 27 MW on average, with an average percent error of 1.4%, an average absolute error of 2.4%, and an average actual/forecast of 1.3%.

2.3.9.1 December 19, 2023

Table 22 provides a summary of forecast peak data for December 19, 2023.

Table 22: Peak Data Summary for December 19, 2023

	Load (MW)	Time	Error (%)[92]	Temperature Delta (°C)[93]	Wind Speed Delta (km/h)[94]
Utility Forecast	997	5:00 p.m.	8.7	0.00	20.00
Utility Actual	917	5:00 p.m.		0.00	20.00
Total Forecast	1,167	5:00 p.m.	14.2	0.00	20.00
Total Actual	1,022	5:00 p.m.		0.00	20.00
Board Forecast	1,405	N/A	N/A	N/A	N/A
Board Actual	1,326				

[92] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[93] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[94] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

The forecast peak at 7:20 a.m., as reported to the Board, was 1,405 MW; the actual reported peak was 1,326 MW. Chart 106 to Chart 110 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

Chart 106 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 1,167 MW; the actual peak was 1,022 MW, resulting in an overestimate of 14.2%.

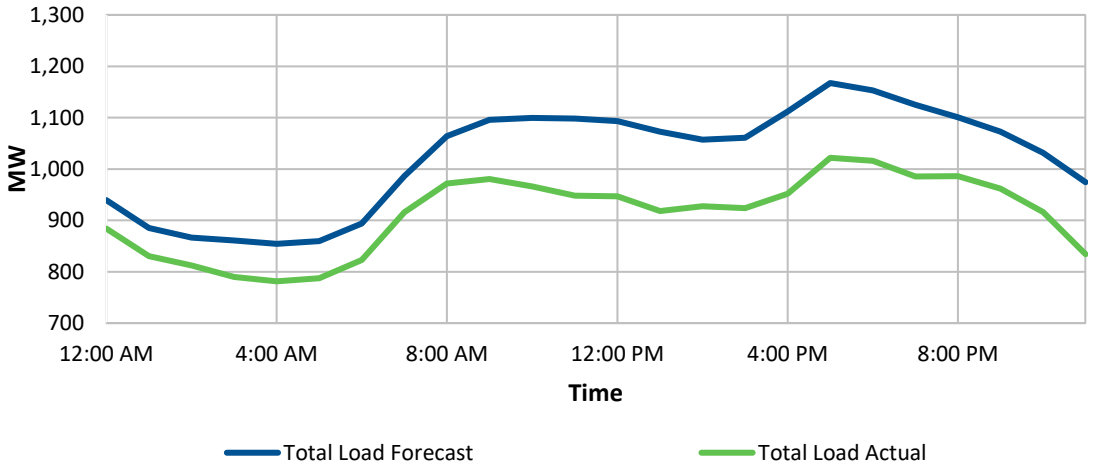

Chart 106: Forecast vs Actual Total Load for December 19, 2023

Chart 107 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 997 MW; the actual peak was 917 MW, resulting in an overestimate of 8.7%.

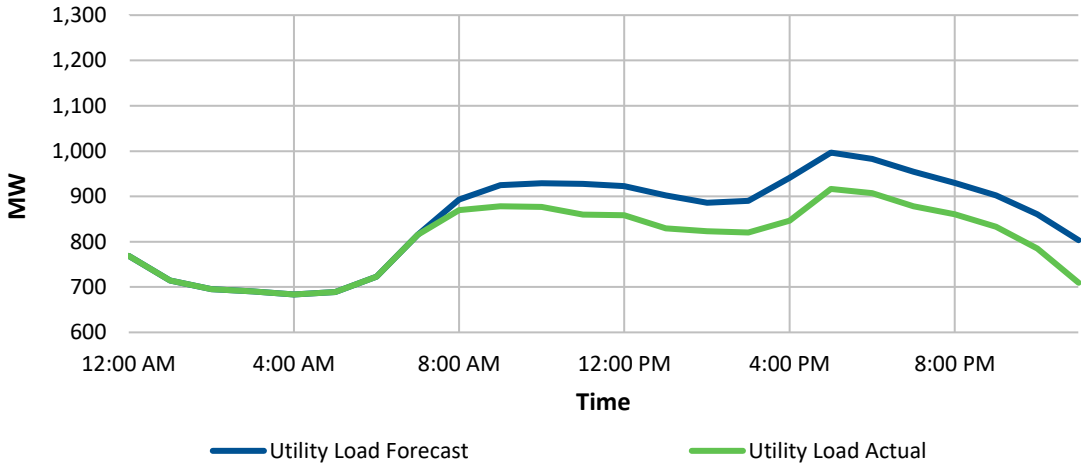

Chart 107: Forecast vs Actual Utility Load for December 19, 2023

Chart 108 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast for the majority of the day; however, it was very warm (9°C at time of peak) for the latter part of December.

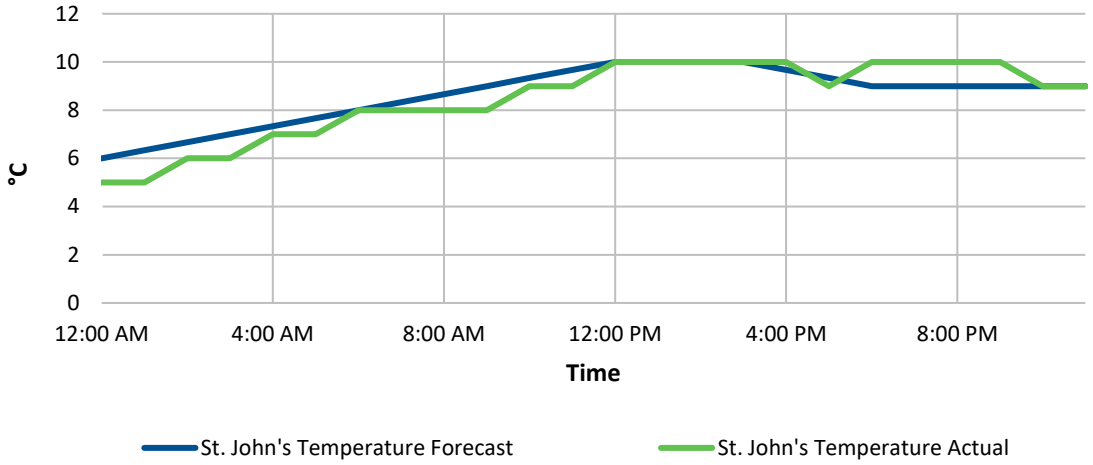

Chart 108: Forecast vs Actual Temperature for December 19, 2023

Chart 109 shows the actual wind speed in St. John's compared to the forecast. The wind speed was less than forecast for the majority of the day, which may have contributed to the forecast error.

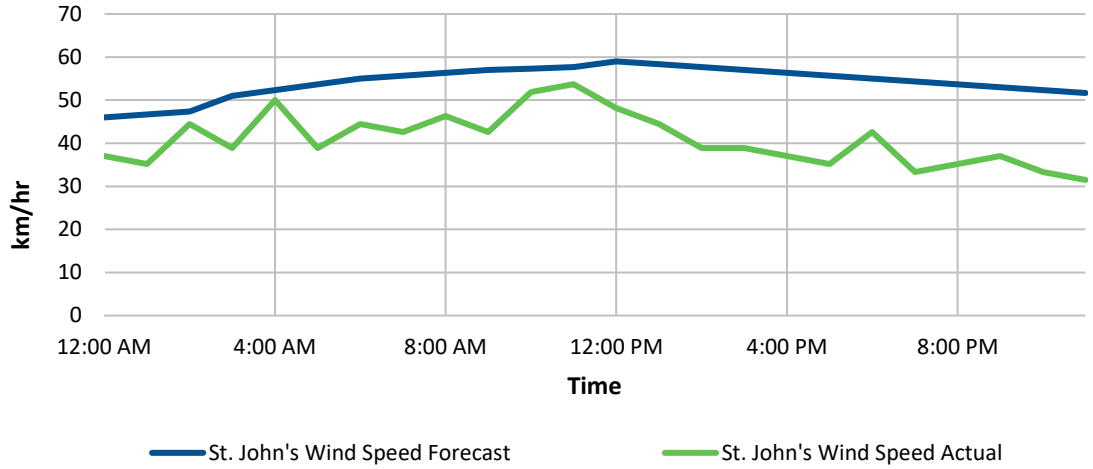

Chart 109: Forecast vs Actual Wind Speed for December 19, 2023

Chart 110 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the entire day.

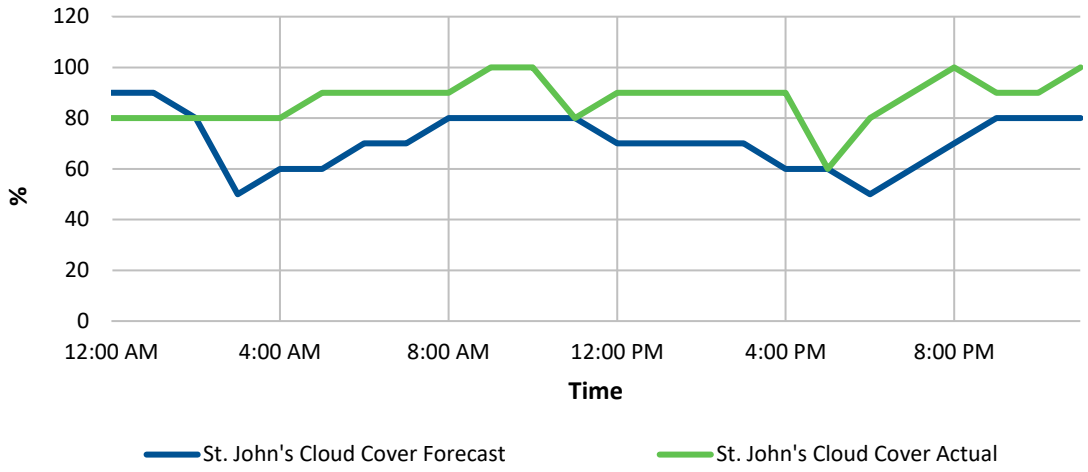

Chart 110: Forecast vs Actual Cloud Cover for December 19, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed the wind speed variations from the forecast and the well above average temperatures.

2.3.9.2 December 20, 2023

Table 23 provides a summary of forecast peak data for December 20, 2023.

Table 23: Peak Data Summary for December 20, 2023

	Load (MW)	Time	Error (%)[95]	Temperature Delta (°C)[96]	Wind Speed Delta (km/h)[97]
Utility Forecast	961	5:00 p.m.	7.1	(1.00)	9.00
Utility Actual	897	5:00 p.m.		(1.00)	9.00
Total Forecast	1,132	5:00 p.m.	13.2	(1.00)	9.00
Total Actual	1,000	5:00 p.m.		(1.00)	9.00
Board Forecast	1,460	N/A	N/A	N/A	N/A
Board Actual	1,306				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,460 MW; the actual reported peak was 1,306 MW. Chart 111 to Chart 115 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[95] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[96] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[97] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 111 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 1,132 MW; the actual peak was 1,000 MW, resulting in an overestimate of 13.2%.

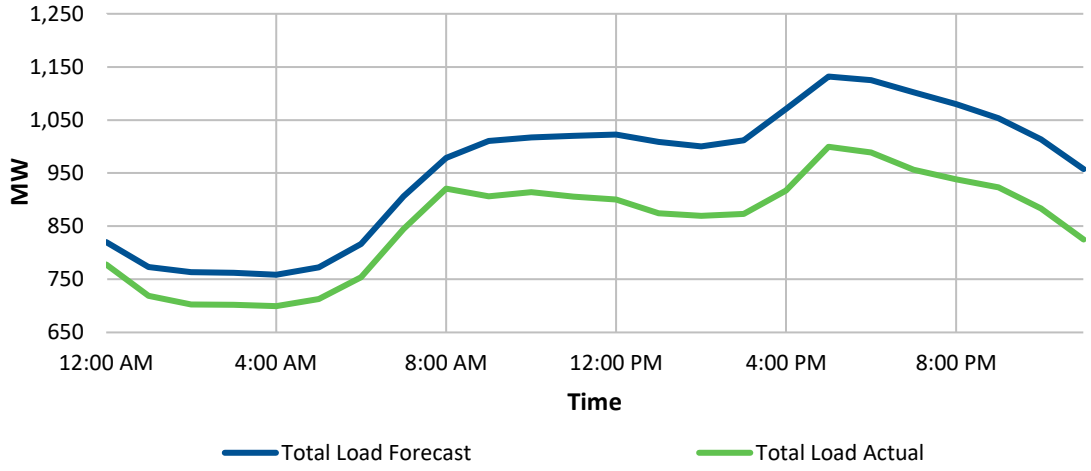

Chart 111: Forecast vs Actual Total Load for December 20, 2023

Chart 112 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 961 MW; the actual peak was 897 MW, resulting in an overestimate of 7.1%.

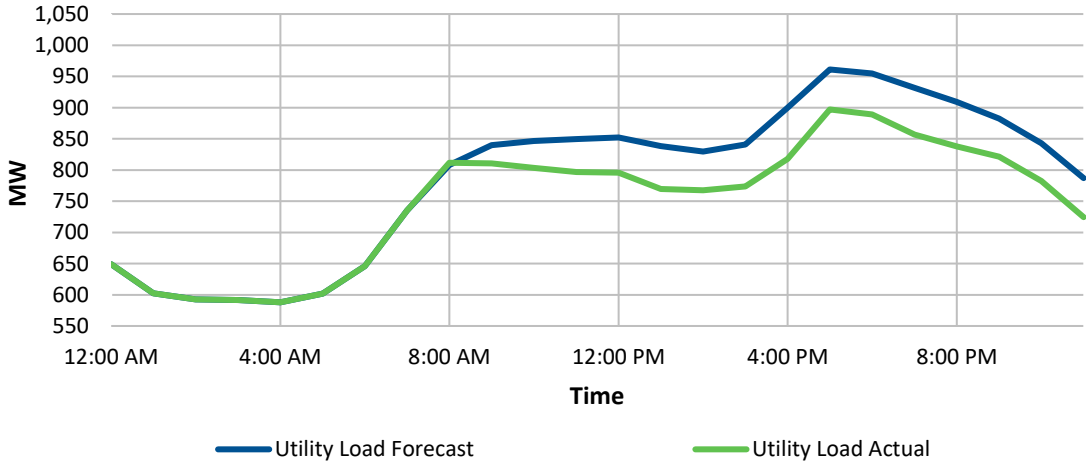

Chart 112: Forecast vs Actual Utility Load for December 20, 2023

Chart 113 shows the actual temperature in St. John's compared to the forecast. The temperature was 1°C to 2°C warmer than forecast for majority of the day, which may have contributed to the forecast error. Similar to temperatures experienced on December 19, it remained very warm (10 °C at time of peak) for the latter part of December.

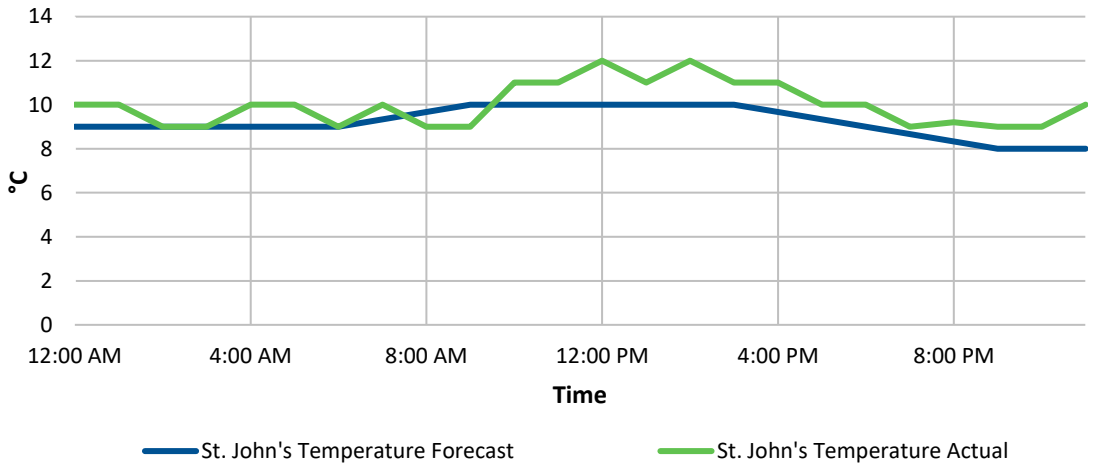

Chart 113: Forecast vs Actual Temperature for December 20, 2023

Chart 114 shows the actual wind speed in St. John's compared to the forecast. The wind speed was less than forecast for the majority of the day, which may have contributed to the forecast error.

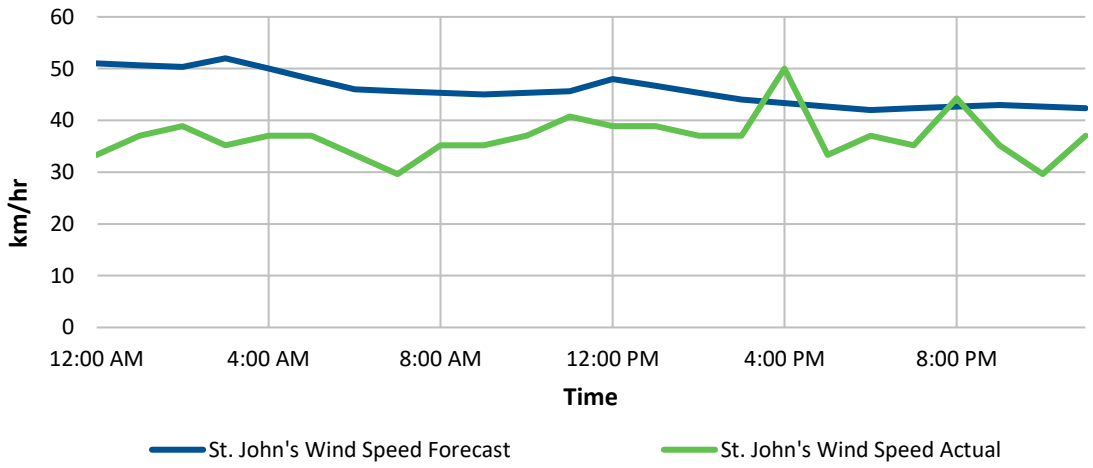

Chart 114: Forecast vs Actual Wind Speed for December 20, 2023

Chart 115 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the majority of the day.

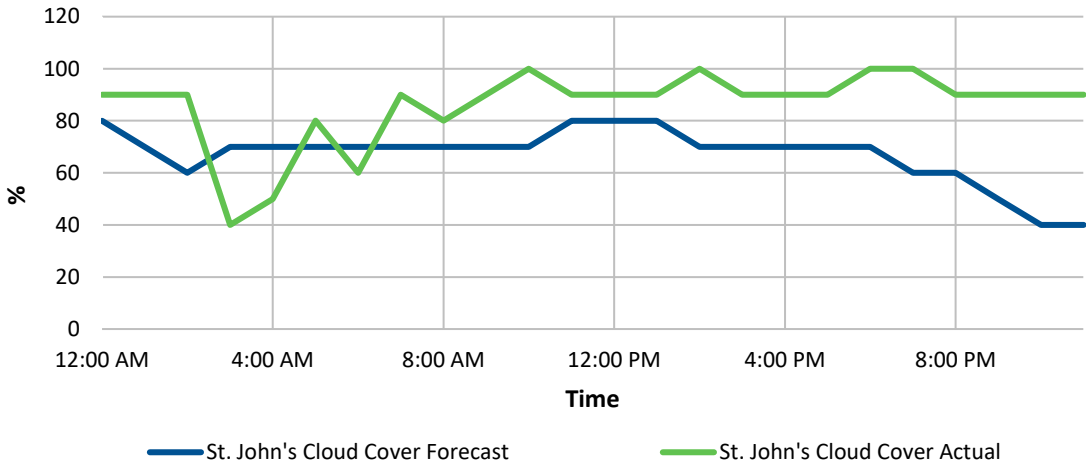

Chart 115: Forecast vs Actual Cloud Cover for December 20, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed the temperature and wind speed variations from the forecast and the well above average temperatures.

2.3.9.3 December 26, 2023

Table 24 provides a summary of forecast peak data for December 26, 2023.

Table 24: Peak Data Summary for December 26, 2023

	Load (MW)	Time	Error (%)[98]	Temperature Delta (°C)[99]	Wind Speed Delta (km/h)[100]
Utility Forecast	1,180	5:00 p.m.	6.5	0.00	1.00
Utility Actual	1,108	12:00 p.m.		1.00	2.00
Total Forecast	1,350	5:00 p.m.	8.8	0.00	1.00
Total Actual	1,241	12:00 p.m.		1.00	2.00
Board Forecast	1,610	N/A	N/A	N/A	N/A
Board Actual	1,555				

The forecast peak at 7:20 a.m., as reported to the Board, was 1,610 MW; the actual reported peak was 1,555 MW. Chart 116 to Chart 120 include hourly plots of forecast and actual values to assist in determining the sources of the differences between actual and forecast loads.

[98] Negative percentages indicate an under-forecasted peak. Positive percentages indicate an over-forecasted peak.
[99] Temperature difference at forecast peak and actual peak. Negative values indicate that the temperature was warmer than forecast. Positive values indicate the temperature was colder than forecast.
[100] Wind speed difference at the forecast peak and the actual peak. Negative values indicate wind speed was more than forecast. Positive values indicate the wind speed was less than forecast.

Chart 116 shows the hourly distribution of the load forecast compared to the actual load, exclusive of export activity. The hourly forecast predicted a 5:00 p.m. peak of 1,350 MW; the actual peak was 1,241 MW and occurred at 12:00 p.m., resulting in an overestimate of 8.8%. The forecast load at the time of peak was 1,187 MW.

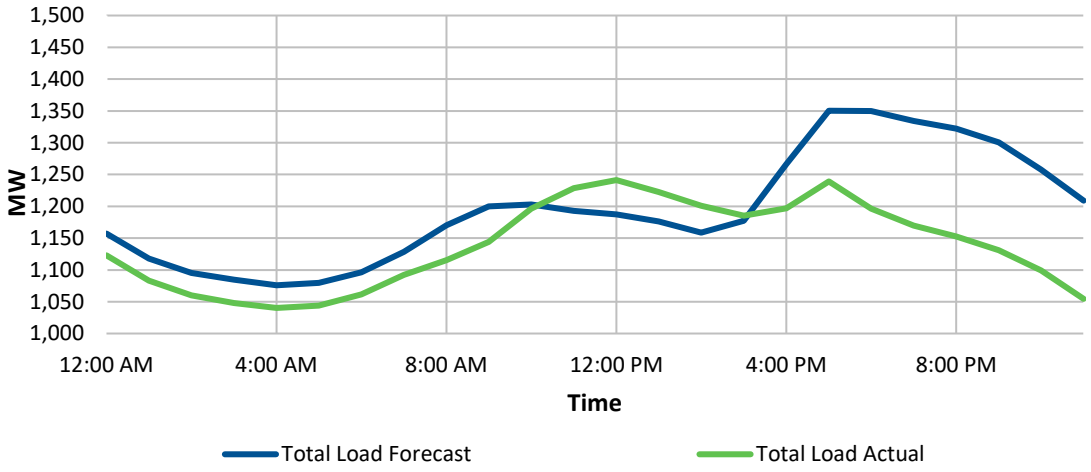

Chart 116: Forecast vs Actual Total Load for December 26, 2023

Chart 117 shows the hourly distribution of the utility load forecast only. The hourly forecast predicted a utility peak at 5:00 p.m. of 1,180 MW; the actual peak was 1,108 MW and occurred at 12:00 p.m., resulting in an overestimate of 6.5%. The forecast load at the time of peak was 1,017 MW.

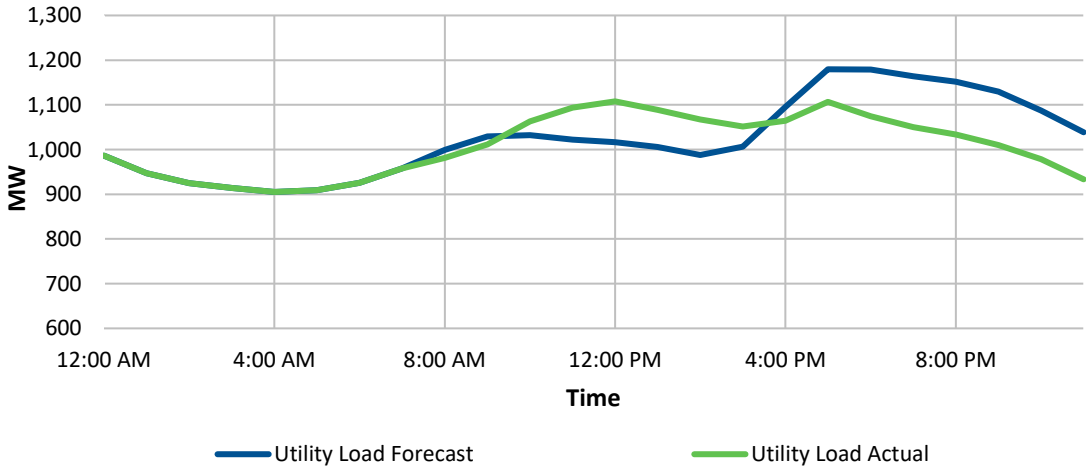

Chart 117: Forecast vs Actual Utility Load for December 26, 2023

Chart 118 shows the actual temperature in St. John's compared to the forecast. The temperature was close to forecast for the majority of the day and is not thought to have contributed to the forecast error.

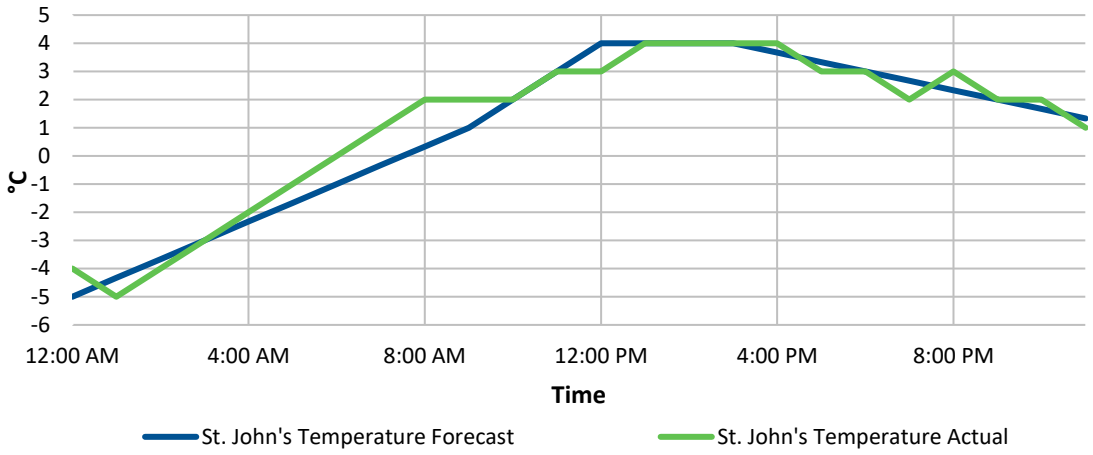

Chart 118: Forecast vs Actual Temperature for December 26, 2023

Chart 119 shows the actual wind speed in St. John's compared to the forecast. For several hours leading up to the peak, the wind speed was less than forecast, which may have contributed to the forecast error.

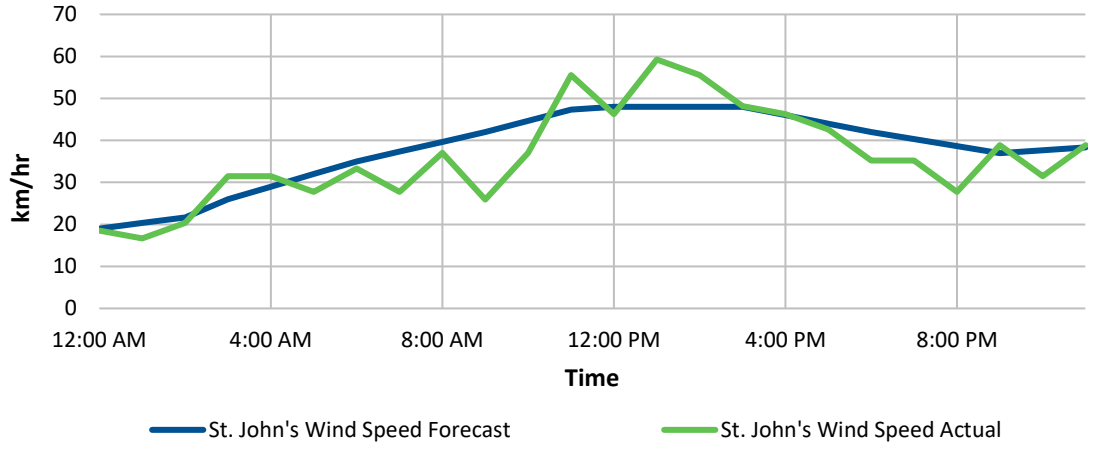

Chart 119: Forecast vs Actual Wind Speed for December 26, 2023

Chart 120 shows the actual cloud cover in St. John's compared to the forecast. It was cloudier than forecast for the entire day.

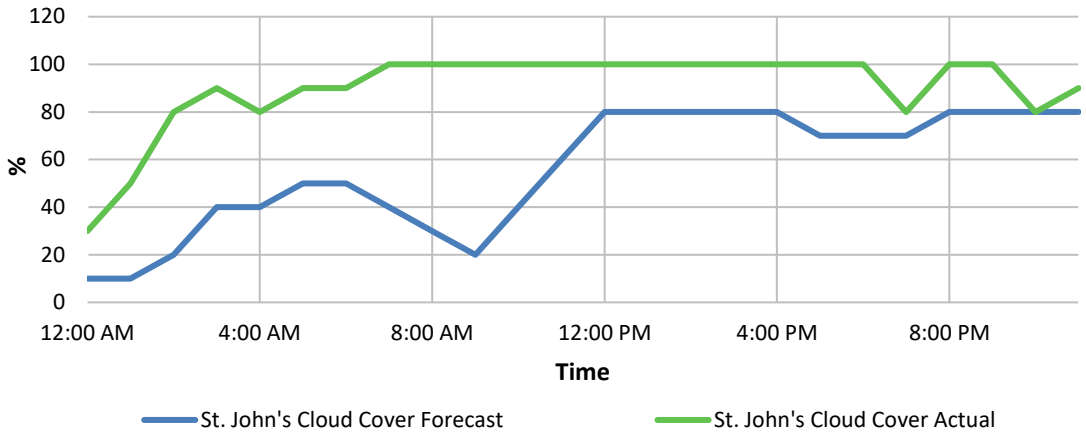

Chart 120: Forecast vs Actual Cloud Cover for December 26, 2023

The discrepancy between Utility Actual and Utility Forecast load was primarily attributed to non-uniform customer behaviour load, as that day was a statutory holiday—Boxing Day.

3.0 Forecast Accuracy Review

Table A-23 summarizes the error in the average monthly peak demand of the utility load forecast by month in 2023.[101] The absolute percent error of the average demand for each month varied between 1.4% (August 2023) and 2.8% (June 2023 and September 2023) with an average of 2.1%. This is lower than last year's observed absolute percent error for average monthly peak demand, which had a maximum average error of 3.1%. For reference, Hydro considers an error below 4.95% to be within acceptable forecasting limits. Comparing absolute percent error, there does not appear to be any seasonal correlation. The average error was negative in seven months of the year and positive in four months of the year. On average, the forecast typically underestimates the load, though the average understatement is -0.2% of actual peak. The average absolute error in 2023 was 19 MW, which compares to the average absolute error in 2022 of 21 MW. The slight decrease in average error at peak is likely due to the implementation of the new short-term load forecasting software.

Table A-24 summarizes the maximum statistics for the utility load forecast by month in 2023. The maximum absolute error varied between 2.6% (February 2023) and 11.1% (June 2023). This is similar to last year's observed maximum error of 10.9%. Comparing absolute percent error, there does not appear to be any seasonal correlation. The maximum errors were positive in all 11 months analyzed. For days

[101] February 23, 2023 through December 31, 2023.

that experienced the maximum errors, the forecast was typically overestimated (rather than underestimated). The largest absolute error at peak in 2023 was 116 MW and occurred on March 4, 2023, which fell on a weekend.

Table A-25 summarizes the error at the ten highest utility loads during the reporting period. The highest loads in this reporting period occurred in February 2023 (six instances), March 2023 (three instances), and December 2023 (one instance). Three of the ten highest loads were overestimated and seven were underestimated. The percent error varied from -2.6% to 2.6%; the overall average was -0.2%. The absolute percent error varied from 0.0% to 2.6%, with an average of 1.6%. These statistics confirm that there is no correlation between high load and high error in the load forecast and that the short-term load forecasting software's forecasting of high loads are well within the acceptable forecasting limit of less than 4.95% error.

Table A-26 summarizes the result of the investigations into instances of high forecast error selected based on high error in the utility load forecast against the actual utility load at peak. Most errors occur because of variations in the weather forecast at or near the time of peak. Non-uniform customer behaviour is also a source of error, as some high error days occurred on the weekend or statutory holidays. Some errors remain unexplained; they result from unpredictable customer behavior that was not modelled correctly by the load forecasting software. Of the 24 included instances of high forecast error, 11 occurred on a weekend and 13 occurred on a weekday. Of the 13 weekdays, 3 fell on statutory holidays.

Appendix A

Supporting Tables

Table A-1: Total Island Interconnected System Load Forecasting Data for February 2023[1]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[2] (MW)	Forecast Reserve[3] (MW)
23-Feb-2023	1,730	1,706	24	1.4	2,316	586
24-Feb-2023	1,940	1,931	9	0.5	2,265	325
25-Feb-2023	1,810	1,846	-36	-2.0	2,281	471
26-Feb-2023	1,875	1,865	10	0.5	2,309	434
27-Feb-2023	1,985	1,988	-3	-0.2	2,439	454
28-Feb-2023	1,985	1,954	31	1.6	2,438	453
Minimum	1,730	1,706	-36	-2.0	2,265	325
Average	1,888	1,882	6	0.3	2,341	454
Maximum	1,985	1,988	31	1.6	2,439	586

[1] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[2] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[3] Includes exports via the Maritime Link.

Table A-2: Total Island Interconnected System Load Forecasting Data for March 2023[4]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[5] (MW)	Forecast Reserve[6] (MW)
1-Mar-2023	1,930	1,882	48	2.6	2,453	523
2-Mar-2023	1,870	1,806	64	3.5	2,310	440
3-Mar-2023	1,775	1,748	27	1.5	2,429	654
4-Mar-2023	**1,690**	**1,590**	**100**	**6.3**	**2,474**	**784**
5-Mar-2023	1,635	1,586	49	3.1	2,441	806
6-Mar-2023	1,620	1,538	82	5.3	2,154	534
7-Mar-2023	1,575	1,509	66	4.4	2,176	601
8-Mar-2023	1,650	1,569	81	5.2	1,818	168[7]
9-Mar-2023	1,695	1,660	35	2.1	2,126	431
10-Mar-2023	1,675	1,638	37	2.3	2,141	466
11-Mar-2023	1,625	1,601	24	1.5	2,141	516
12-Mar-2023	1,615	1,583	32	2.0	2,141	526
13-Mar-2023	1,615	1,572	43	2.7	2,150	535
14-Mar-2023	1,585	1,365	220	16.1	1,950	365
15-Mar-2023	1,595	1,348	247	18.3	1,945	350
16-Mar-2023	1,335	1,306	29	2.2	1,950	615
17-Mar-2023	1,520	1,262	258	20.4	1,935	415
18-Mar-2023	1,510	1,434	76	5.3	1,945	435
19-Mar-2023	**1,480**	**1,555**	**-75**	**-4.8**	**2,305**	**825**
20-Mar-2023	1,695	1,636	59	3.6	2,381	686
21-Mar-2023	1,595	1,618	-23	-1.4	2,377	782
22-Mar-2023	1,490	1,500	-10	-0.7	2,313	823
23-Mar-2023	1,400	1,361	39	2.9	1,960	560
24-Mar-2023	1,425	1,403	22	1.6	1,965	540
25-Mar-2023	1,305	1,299	6	0.5	1,980	675
26-Mar-2023	1,270	1,254	16	1.3	1,950	680
27-Mar-2023	1,320	1,322	-2	-0.2	1,925	605
28-Mar-2023	1,495	1,415	80	5.7	1,845	350
29-Mar-2023	1,470	1,380	90	6.5	1,845	375
30-Mar-2023	1,595	1,590	5	0.3	2,263	668
31-Mar-2023	1,595	1,481	114	7.7	1,855	260
Minimum	1,270	1,254	-75	-4.8	1,818	168
Average	1,569	1,510	59	4.1	2,118	548
Maximum	1,930	1,882	258	20.4	2,474	825

[4] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[5] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[6] Includes exports via the Maritime Link.
[7] The 1,695 MW peak load forecast at 7:20 a.m. included 360 MW of Maritime Link exports, which was contingent upon the LIL returning to service from a trip that occurred overnight. The LIL did not return to service until 5:16 p.m. on March 8, 2023 so the Maritime Link exports included in the 7:20 a.m. forecast were curtailed until the LIL was returned to service.

Table A-3: Total Island Interconnected System Load Forecasting Data for April 2023[8]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[9] (MW)	Forecast Reserve[10] (MW)
1-Apr-2023	1,485	1,442	43	3.0	2,127	642
2-Apr-2023	1,345	1,284	61	4.8	1,965	620
3-Apr-2023	1,490	1,414	76	5.4	2,267	777
4-Apr-2023	1,475	1,448	27	1.9	2,192	717
5-Apr-2023	1,485	1,457	28	1.9	2,291	806
6-Apr-2023	1,760	1,675	85	5.1	2,192	432
7-Apr-2023	**1,400**	**1,441**	**-41**	**-2.8**	**2,223**	**823**
8-Apr-2023	1,655	1,593	62	3.9	2,305	650
9-Apr-2023	1,480	1,434	46	3.2	2,126	646
10-Apr-2023	1,485	1,459	26	1.8	2,136	651
11-Apr-2023	1,355	1,310	45	3.4	2,092	737
12-Apr-2023	1,320	1,300	20	1.5	2,088	768
13-Apr-2023	1,390	1,377	13	0.9	2,087	697
14-Apr-2023	1,400	1,344	56	4.2	2,110	710
15-Apr-2023	1,370	1,336	34	2.5	2,150	780
16-Apr-2023	**1,310**	**1,237**	**73**	**5.9**	**2,078**	**768**
17-Apr-2023	1,340	1,313	27	2.1	1,921	581
18-Apr-2023	1,410	1,334	76	5.7	1,865	455
19-Apr-2023	1,380	1,333	47	3.5	1,873	493
20-Apr-2023	1,345	1,344	1	0.1	1,962	617
21-Apr-2023	1,360	1,371	-11	-0.8	1,975	615
22-Apr-2023	**1,455**	**1,438**	**17**	**1.2**	**2,055**	**600**
23-Apr-2023	1,185	1,434	-249	-17.4	2,054	869
24-Apr-2023	1,450	1,453	-3	-0.2	2,064	614
25-Apr-2023	1,470	1,457	13	0.9	2,032	562
26-Apr-2023	1,455	1,399	56	4.0	2,033	578
27-Apr-2023	1,460	1,424	36	2.5	2,023	563
28-Apr-2023	1,475	1,458	17	1.2	2,213	738
29-Apr-2023	1,425	1,414	11	0.8	2,248	823
30-Apr-2023	1,440	1,379	61	4.4	2,139	699
Minimum	1,185	1,237	-249	-17.4	1,865	432
Average	1,429	1,403	25	1.8	2,096	668
Maximum	1,760	1,675	85	5.9	2,305	869

[8] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[9] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[10] Includes exports via the Maritime Link.

Table A-4: Total Island Interconnected System Load Forecasting Data for May 2023[11]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[12] (MW)	Forecast Reserve[13] (MW)
1-May-2023	1,475	1,469	6	0.4	2,249	774
2-May-2023	1,430	1,418	12	0.8	2,120	690
3-May-2023	1,400	1,355	45	3.3	1,952	552
4-May-2023	1,375	1,364	11	0.8	1,971	596
5-May-2023	**1,390**	**1,419**	**-29**	**-2.0**	**1,994**	**604**
6-May-2023	1,360	1,381	-21	-1.5	1,947	587
7-May-2023	1,320	1,310	10	0.8	1,950	630
8-May-2023	1,330	1,309	21	1.6	1,988	658
9-May-2023	1,320	1,352	-32	-2.4	1,954	634
10-May-2023	1,395	1,363	32	2.3	1,992	597
11-May-2023	1,290	1,251	39	3.1	1,890	600
12-May-2023	1,160	1,140	20	1.8	1,793	633
13-May-2023	1,140	1,096	44	4.0	1,842	702
14-May-2023	1,150	1,176	-26	-2.2	1,844	694
15-May-2023	1,230	1,193	37	3.1	1,868	638
16-May-2023	1,185	1,137	48	4.2	1,858	673
17-May-2023	1,170	1,161	9	0.8	1,923	753
18-May-2023	1,250	1,185	65	5.5	2,009	759
19-May-2023	1,260	1,208	52	4.3	1,845	585
20-May-2023	1,220	1,188	32	2.7	1,921	701
21-May-2023	**1,165**	**1,083**	**82**	**7.6**	**1,855**	**690**
22-May-2023	**1,225**	**1,158**	**67**	**5.8**	**1,828**	**603**
23-May-2023	1,285	1,261	24	1.9	1,850	565
24-May-2023	1,310	1,279	31	2.4	1,816	506
25-May-2023	1,240	1,229	11	0.9	1,596	356
26-May-2023	1,340	1,318	22	1.7	1,758	418
27-May-2023	1,195	1,135	60	5.3	1,622	427
28-May-2023	1,140	1,154	-14	-1.2	1,689	549
29-May-2023	1,220	1,259	-39	-3.1	1,709	489
30-May-2023	1,275	1,269	6	0.5	1,770	495
31-May-2023	1,185	1,185	0	0.0	1,732	547
Minimum	1,140	1,083	-39	-3.1	1,596	356
Average	1,272	1,252	20	1.7	1,875	603
Maximum	1,475	1,469	82	7.6	2,249	774

[11] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[12] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[13] Includes exports via the Maritime Link.

Table A-5: Total Island Interconnected System Load Forecasting Data for June 2023[14]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[15] (MW)	Forecast Reserve[16] (MW)
1-Jun-2023	1,155	1,132	23	2.0	1,573	418
2-Jun-2023	1,205	1,103	102	9.2	1,547	342
3-Jun-2023	**1,075**	**1,111**	**-36**	**-3.2**	**1,512**	**437**
4-Jun-2023	1,100	1,092	8	0.7	1,515	415
5-Jun-2023	1,245	1,077	168	15.6	1,478	233
6-Jun-2023	1,075	1,063	12	1.1	1,525	450
7-Jun-2023	1,090	1,047	43	4.1	1,379	289
8-Jun-2023	1,030	977	53	5.4	1,366	336
9-Jun-2023	1,045	1,055	-10	-0.9	1,523	478
10-Jun-2023	**1,145**	**1,210**	**-65**	**-5.4**	**1,608**	**463**
11-Jun-2023	1,190	1,191	-1	-0.1	1,654	464
12-Jun-2023	1,245	1,210	35	2.9	1,665	420
13-Jun-2023	1,215	1,143	72	6.3	1,679	464
14-Jun-2023	1,160	1,129	31	2.7	1,533	373
15-Jun-2023	1,110	1,070	40	3.7	1,528	418
16-Jun-2023	1,170	1,163	7	0.6	1,583	413
17-Jun-2023	1,075	1,040	35	3.4	1,531	456
18-Jun-2023	1,105	1,121	-16	-1.4	1,667	562
19-Jun-2023	1,215	1,170	45	3.8	1,660	445
20-Jun-2023	1,225	1,211	14	1.2	1,807	582
21-Jun-2023	1,210	1,159	51	4.4	1,716	506
22-Jun-2023	**1,120**	**856**	**264**	**30.8**	**1,424**	**304**
23-Jun-2023	1,100	856	244	28.5	1,476	376
24-Jun-2023	990	843	147	17.4	1,490	500
25-Jun-2023	1,045	897	148	16.5	1,498	453
26-Jun-2023	1,150	971	179	18.4	1,552	402
27-Jun-2023	1,150	887	263	29.7	1,330	180[17]
28-Jun-2023	960	927	33	3.6	1,545	585
29-Jun-2023	940	978	-38	-3.9	1,534	594
30-Jun-2023	1,040	983	57	5.8	1,646	606
Minimum	940	843	-65	-5.4	1,330	180
Average	1,119	1,056	64	6.8	1,551	432
Maximum	1,245	1,211	264	30.8	1,807	606

[14] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[15] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[16] Includes exports via the Maritime Link.
[17] The 1,150 MW peak load forecast at 7:20 a.m. included 370 MW of Maritime Link exports, which was contingent upon the LIL returning to service from a trip on June 26, 2023. The LIL did not return to service until 10:18 a.m. on June 27, 2023 so the Maritime Link exports included in the 7:20 a.m. forecast were curtailed until the LIL was returned to service.

Table A-6: Total Island Interconnected System Load Forecasting Data for July 2023[18]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[19] (MW)	Forecast Reserve[20] (MW)
1-Jul-2023	1,005	975	30	3.1	1,602	597
2-Jul-2023	1,080	1,000	80	8.0	1,673	593
3-Jul-2023	1,105	1,044	61	5.8	1,654	549
4-Jul-2023	**1,100**	**1,074**	**26**	**2.4**	**1,668**	**568**
5-Jul-2023	1,120	1,051	69	6.6	1,718	598
6-Jul-2023	1,060	1,018	42	4.1	1,578	518
7-Jul-2023	1,035	1,021	14	1.4	1,598	563
8-Jul-2023	1,020	987	33	3.3	1,786	766
9-Jul-2023	1,030	990	40	4.0	1,792	762
10-Jul-2023	745	882	-137	-15.5	1,280	535
11-Jul-2023	725	665	60	9.0	1,340	615
12-Jul-2023	720	710	10	1.4	1,345	625
13-Jul-2023	**680**	**698**	**-18**	**-2.6**	**1,180**	**500**
14-Jul-2023	715	714	1	0.1	1,295	580
15-Jul-2023	980	949	31	3.3	1,453	473
16-Jul-2023	1,000	959	41	4.3	1,516	516
17-Jul-2023	1,045	1,030	15	1.5	1,596	551
18-Jul-2023	1,045	1,016	29	2.9	1,604	559
19-Jul-2023	1,030	1,000	30	3.0	1,561	531
20-Jul-2023	1,060	1,016	44	4.3	1,616	556
21-Jul-2023	1,050	1,015	35	3.4	1,616	566
22-Jul-2023	1,000	997	3	0.3	1,455	455
23-Jul-2023	1,020	985	35	3.6	1,591	571
24-Jul-2023	1,065	1,022	43	4.2	1,630	565
25-Jul-2023	1,050	1,003	47	4.7	1,532	482
26-Jul-2023	1,125	1,086	39	3.6	1,491	366
27-Jul-2023	1,035	986	49	5.0	1,505	470
28-Jul-2023	1,055	970	85	8.8	1,597	542
29-Jul-2023	1,025	1,006	19	1.9	1,585	560
30-Jul-2023	1,030	1,013	17	1.7	1,580	550
31-Jul-2023	1,000	923	77	8.3	1,576	576
Minimum	680	665	-137	-15.5	1,180	366
Average	992	961	31	3.1	1,549	557
Maximum	1,125	1,086	85	9.0	1,792	766

[18] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[19] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[20] Includes exports via the Maritime Link.

Table A-7: Total Island Interconnected System Load Forecasting Data for August 2023[21]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[22] (MW)	Forecast Reserve[23] (MW)
1-Aug-2023	1,010	927	83	9.0	1,571	561
2-Aug-2023	1,050	994	56	5.6	1,597	547
3-Aug-2023	1,045	999	46	4.6	1,545	500
4-Aug-2023	1,075	1,048	27	2.6	1,642	567
5-Aug-2023	970	934	36	3.9	1,587	617
6-Aug-2023	995	952	43	4.5	1,606	611
7-Aug-2023	1,040	978	62	6.3	1,423	383
8-Aug-2023	1,030	977	53	5.4	1,446	416
9-Aug-2023	1,025	966	59	6.1	1,433	408
10-Aug-2023	1,035	1,015	20	2.0	1,432	397
11-Aug-2023	1,020	962	58	6.0	1,407	387
12-Aug-2023	980	933	47	5.0	1,453	473
13-Aug-2023	985	928	57	6.1	1,445	460
14-Aug-2023	1,015	979	36	3.7	1,430	415
15-Aug-2023	1,015	935	80	8.6	1,362	347
16-Aug-2023	1,010	946	64	6.8	1,396	386
17-Aug-2023	1,010	942	68	7.2	1,429	1,328
18-Aug-2023	990	945	45	4.8	1,423	433
19-Aug-2023	970	950	20	2.1	1,452	482
20-Aug-2023	985	951	34	3.6	1,425	440
21-Aug-2023	1,025	972	53	5.5	1,424	399
22-Aug-2023	1,075	1,037	38	3.7	1,528	453
23-Aug-2023	1,060	1,020	40	3.9	1,467	407
24-Aug-2023	1,055	990	65	6.6	1,365	310
25-Aug-2023	1,035	980	55	5.6	1,508	473
26-Aug-2023	965	921	44	4.8	1,471	506
27-Aug-2023	1,065	1,043	22	2.1	1,563	498
28-Aug-2023	1,075	1,057	18	1.7	1,634	559
29-Aug-2023	1,090	1,054	36	3.4	1,711	621
30-Aug-2023	1,130	1,097	33	3.0	1,696	566
31-Aug-2023	1,150	1,107	43	3.9	1,728	578
Minimum	965	921	18	1.7	1,362	310
Average	1,002	985	46	4.8	1,503	501
Maximum	1,150	1,107	83	9.0	1,728	1,328

[21] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[22] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[23] Includes exports via the Maritime Link.

Table A-8: Total Island Interconnected System Load Forecasting Data for September 2023[24]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[25] (MW)	Forecast Reserve[26] (MW)
1-Sep-2023	1,130	1,091	39	3.6	1,686	556
2-Sep-2023	1,085	1,057	28	2.6	1,698	613
3-Sep-2023	**890**	**918**	**-28**	**-3.1**	**1,497**	**607**
4-Sep-2023	880	829	51	6.2	1,448	568
5-Sep-2023	890	891	-1	-0.1	1,398	508
6-Sep-2023	905	865	40	4.6	1,386	481
7-Sep-2023	915	904	11	1.2	1,397	482
8-Sep-2023	925	870	55	6.3	1,476	551
9-Sep-2023	870	856	14	1.6	1,461	591
10-Sep-2023	990	888	102	11.5	1,467	477
11-Sep-2023	920	889	31	3.5	1,455	535
12-Sep-2023	920	896	24	2.7	1,487	567
13-Sep-2023	1,015	915	100	10.9	1,459	444
14-Sep-2023	990	925	65	7.0	1,529	539
15-Sep-2023	920	886	34	3.8	1,451	531
16-Sep-2023	885	887	-2	-0.2	1,447	562
17-Sep-2023	735	751	-16	-2.1	1,352	617
18-Sep-2023	750	739	11	1.5	1,230	480
19-Sep-2023	**765**	**766**	**-1**	**-0.1**	**1,190**	**425**
20-Sep-2023	755	747	8	1.1	1,255	500
21-Sep-2023	785	800	-15	-1.9	1,260	475
22-Sep-2023	860	805	55	6.8	1,305	445
23-Sep-2023	790	802	-12	-1.5	1,295	505
24-Sep-2023	775	761	14	1.8	1,280	505
25-Sep-2023	870	850	20	2.4	1,260	390
26-Sep-2023	950	886	64	7.2	1,270	320
27-Sep-2023	1,170	1,145	25	2.2	1,588	418
28-Sep-2023	**1,215**	**1,135**	**80**	**7.0**	**1,668**	**453**
29-Sep-2023	1,120	1,101	19	1.7	1,495	375
30-Sep-2023	1,150	1,112	38	3.4	1,701	551
Minimum	735	739	-28	-3.1	1,190	320
Average	927	899	28	3.1	1,430	502
Maximum	1,215	1,145	102	11.5	1,701	617

[24] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[25] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[26] Includes exports via the Maritime Link.

Table A-9: Total Island Interconnected System Load Forecasting Data for October 2023[27]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[28] (MW)	Forecast Reserve[29] (MW)
1-Oct-2023	1,125	1,098	27	2.5	1,703	578
2-Oct-2023	1,110	1,083	27	2.5	1,677	567
3-Oct-2023	1,050	1,025	25	2.4	1,670	620
4-Oct-2023	1,145	1,097	48	4.4	1,630	485
5-Oct-2023	1,190	1,175	15	1.3	1,703	513
6-Oct-2023	1,105	1,077	28	2.6	1,705	600
7-Oct-2023	1,080	1,051	29	2.8	1,629	549
8-Oct-2023	1,050	1,021	29	2.8	1,629	579
9-Oct-2023	1,085	1,045	40	3.8	1,698	613
10-Oct-2023	1,070	1,018	52	5.1	1,690	620
11-Oct-2023	1,045	968	77	8.0	1,504	459
12-Oct-2023	1,055	1,034	21	2.0	1,509	454
13-Oct-2023	1,075	1,029	46	4.5	1,684	609
14-Oct-2023	1,085	1,081	4	0.4	1,726	641
15-Oct-2023	1,135	1,079	56	5.2	1,695	560
16-Oct-2023	**1,110**	**1,190**	**-80**	**-6.7**	**1,857**	**747**
17-Oct-2023	1,230	1,192	38	3.2	1,764	534
18-Oct-2023	1,270	1,224	46	3.8	1,731	461
19-Oct-2023	1,185	1,152	33	2.9	1,725	540
20-Oct-2023	1,240	1,192	48	4.0	1,696	456
21-Oct-2023	**1,215**	**1,235**	**-20**	**-1.6**	**1,712**	**497**
22-Oct-2023	**1,180**	**1,200**	**-20**	**-1.7**	**1,634**	**454**
23-Oct-2023	1,235	1,258	-23	-1.8	1,700	465
24-Oct-2023	1,455	1,443	12	0.8	1,817	362
25-Oct-2023	1,265	1,242	23	1.9	1,678	413
26-Oct-2023	1,205	1,208	-3	-0.2	1,652	447
27-Oct-2023	1,285	1,266	19	1.5	1,674	389
28-Oct-2023	1,200	1,255	-55	-4.4	1,764	564
29-Oct-2023	1,370	1,357	13	1.0	1,812	442
30-Oct-2023	1,395	1,348	47	3.5	1,763	368
31-Oct-2023	1,330	1,296	34	2.6	1,725	395
Minimum	1,045	968	-80	-6.7	1,504	362
Average	1,180	1,159	21	1.9	1,695	516
Maximum	1,455	1,443	77	8.0	1,857	747

[27] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[28] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[29] Includes exports via the Maritime Link.

Table A-10: Total Island Interconnected System Load Forecasting Data for November 2023[30]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[31] (MW)	Forecast Reserve[32] (MW)
1-Nov-2023	1,385	1,322	63	4.8	1,771	386
2-Nov-2023	1,390	1,353	37	2.7	1,729	339
3-Nov-2023	1,430	1,363	67	4.9	1,796	366
4-Nov-2023	1,310	1,317	-7	-0.5	1,564	254
5-Nov-2023	1,245	1,341	-96	-7.2	1,557	312
6-Nov-2023	**1,450**	**1,375**	**75**	**5.5**	**1,816**	**366**
7-Nov-2023	1,410	1,397	13	0.9	1,802	392
8-Nov-2023	1,340	1,297	43	3.3	1,728	388
9-Nov-2023	1,355	1,377	-22	-1.6	1,658	303
10-Nov-2023	1,405	1,382	23	1.7	1,755	350
11-Nov-2023	1,445	1,393	52	3.7	1,827	382
12-Nov-2023	1,485	1,422	63	4.4	1,945	460
13-Nov-2023	1,470	1,466	4	0.3	1,941	471
14-Nov-2023	1,475	1,461	14	1.0	1,987	512
15-Nov-2023	1,475	1,462	13	0.9	1,917	442
16-Nov-2023	1,480	1,446	34	2.4	1,898	418
17-Nov-2023	1,435	1,401	34	2.4	1,831	396
18-Nov-2023	1,330	1,306	24	1.8	1,837	507
19-Nov-2023	1,320	1,301	19	1.5	1,886	566
20-Nov-2023	1,420	1,378	42	3.0	1,889	469
21-Nov-2023	1,420	1,381	39	2.8	1,872	452
22-Nov-2023	1,445	1,427	18	1.3	1,844	399
23-Nov-2023	1,435	1,416	19	1.3	1,818	383
24-Nov-2023	1,380	1,328	52	3.9	1,856	476
25-Nov-2023	1,460	1,419	41	2.9	1,876	416
26-Nov-2023	**1,375**	**1,417**	**-42**	**-3.0**	**1,944**	**569**
27-Nov-2023	1,435	1,405	30	2.1	1,939	504
28-Nov-2023	1,385	1,378	7	0.5	1,967	582
29-Nov-2023	1,535	1,528	7	0.5	1,981	446
30-Nov-2023	1,570	1,554	16	1.0	2,077	507
Minimum	1,245	1,297	-96	-7.2	1,557	254
Average	1,417	1,394	23	1.6	1,844	427
Maximum	1,570	1,554	75	5.5	2,077	582

[30] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[31] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[32] Includes exports via the Maritime Link.

Table A-11: Total Island Interconnected System Load Forecasting Data for December 2023[33]

Date	Forecast Total Peak (MW)	Actual Total Peak (MW)	Error (MW)	Error (%)	Available Island Supply[34] (MW)	Forecast Reserve[35] (MW)
1-Dec-2023	1,585	1,514	71	4.7	2,071	486
2-Dec-2023	1,540	1,496	44	2.9	2,016	476
3-Dec-2023	1,500	1,423	77	5.4	1,921	421
4-Dec-2023	1,515	1,498	17	1.1	2,094	579
5-Dec-2023	1,635	1,504	131	8.7	2,077	442
6-Dec-2023	1,660	1,560	100	6.4	2,119	459
7-Dec-2023	1,615	1,574	41	2.6	1,984	369
8-Dec-2023	1,595	1,554	41	2.6	2,127	532
9-Dec-2023	1,525	1,504	21	1.4	2,098	573
10-Dec-2023	1,550	1,493	57	3.8	2,048	498
11-Dec-2023	1,355	1,346	9	0.7	2,061	706
12-Dec-2023	1,480	1,435	45	3.1	1,812	332
13-Dec-2023	1,490	1,445	45	3.1	2,017	527
14-Dec-2023	1,705	1,664	41	2.5	2,102	397
15-Dec-2023	1,720	1,701	19	1.1	2,170	450
16-Dec-2023	1,650	1,675	-25	-1.5	2,210	560
17-Dec-2023	1,610	1,540	70	4.5	1,780	170
18-Dec-2023	1,470	1,453	17	1.2	1,974	504
19-Dec-2023	**1,405**	**1,326**	**79**	**6.0**	**1,911**	**506**
20-Dec-2023	**1,460**	**1,306**	**154**	**11.8**	**2,144**	**684**
21-Dec-2023	1,505	1,440	65	4.5	2,118	613
22-Dec-2023	1,585	1,536	49	3.2	2,131	546
23-Dec-2023	1,620	1,565	55	3.5	2,087	467
24-Dec-2023	1,630	1,646	-16	-1.0	2,085	455
25-Dec-2023	1,630	1,610	20	1.2	2,024	394
26-Dec-2023	**1,610**	**1,555**	**55**	**3.5**	**2,057**	**447**
27-Dec-2023	1,755	1,694	61	3.6	2,022	267
28-Dec-2023	1,805	1,616	189	11.7	2,058	253
29-Dec-2023	1,770	1,666	104	6.2	1,630	(140)[36]
30-Dec-2023	1,560	1,519	41	2.7	1,997	437
31-Dec-2023	1,590	1,524	66	4.3	2,144	554
Minimum	1,355	1,306	-25	-1.5	1,630	(140)
Average	1,585	1,528	56	3.7	2,035	450
Maximum	1,805	1,701	189	11.8	2,210	706

[33] Forecast Reserve does not include adjustments for interruptible load, the impact of voltage reduction, or scheduled off-Island imports.
[34] Includes total amount forecast to be delivered via the LIL, inclusive of exports.
[35] Includes exports via the Maritime Link.
[36] The 1,630 MW supply value was based on the actual LIL flow at 8:00 a.m., which was only 45 MW. LIL Pole 2 (which was the only pole available, as Pole 1 was out on a planned outage) tripped earlier that morning at 3:10 a.m. and was restored to service at 7:39 a.m. It then remained at the deblock flow of 45 MW until 8:25 a.m. when it started to ramp up. In reality, however, once returned to service, Pole 2 was capable of delivering up to 450 MW if needed, which would have been sufficient for the system to supply the 1,770 MW evening peak that day. Additionally, the load forecast value of 1,770 MW included Maritime Link exports, which would not have been delivered in the event the LIL remained unavailable.

Table A-12: Analysis of Utility Forecast Error for February 2023

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
23-Feb-2023	1,437	1,401	-37	37	-2.6	2.6	-2.6
24-Feb-2023	1,615	1,603	-12	12	-0.7	0.7	-0.7
25-Feb-2023	1,540	1,502	-38	38	-2.5	2.5	-2.5
26-Feb-2023	1,547	1,523	-24	24	-1.5	1.5	-1.6
27-Feb-2023	1,622	1,658	36	36	2.2	2.2	2.2
28-Feb-2023	1,582	1,615	33	33	2.1	2.1	2.1
Minimum	1,437	1,401	-38	12	-2.6	0.7	-2.6
Average	1,557	1,550	-7	30	-0.5	1.9	-0.5
Maximum	1,622	1,658	36	38	2.2	2.6	2.2

Table A-13: Analysis of Utility Forecast Error for March 2023[37]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Mar-2023	1,559	1,559	0	0	0.0	0.0	0.0
2-Mar-2023	1,511	1,497	-13	13	-0.9	0.9	-0.9
3-Mar-2023	1,368	1,404	36	36	2.6	2.6	2.6
4-Mar-2023	**1,242**	**1,357**	**116**	**116**	**9.3**	**9.3**	**8.5**
5-Mar-2023	1,244	1,267	24	24	1.9	1.9	1.9
6-Mar-2023	1,227	1,248	21	21	1.7	1.7	1.7
7-Mar-2023	1,198	1,207	9	9	0.8	0.8	0.8
8-Mar-2023	1,168	1,171	3	3	0.3	0.3	0.3
9-Mar-2023	1,211	1,222	10	10	0.9	0.9	0.9
10-Mar-2023	1,193	1,198	4	4	0.4	0.4	0.4
11-Mar-2023	1,145	1,147	1	1	0.1	0.1	0.1
12-Mar-2023	1,137	1,138	1	1	0.1	0.1	0.1
13-Mar-2023	1,193	1,193	0	0	0.0	0.0	0.0
14-Mar-2023	1,240	1,235	-6	6	-0.5	0.5	-0.5
15-Mar-2023	1,227	1,211	-16	16	-1.3	1.3	-1.3
16-Mar-2023	1,180	1,151	-29	29	-2.4	2.4	-2.5
17-Mar-2023	1,136	1,141	4	4	0.4	0.4	0.4
18-Mar-2023	1,064	1,070	6	6	0.6	0.6	0.6
19-Mar-2023	**1,096**	**1,039**	**-57**	**57**	**-5.2**	**5.2**	**-5.5**
20-Mar-2023	1,257	1,218	-39	39	-3.1	3.1	-3.2
21-Mar-2023	1,246	1,267	20	20	1.6	1.6	1.6
22-Mar-2023	1,171	1,163	-8	8	-0.7	0.7	-0.7
23-Mar-2023	1,227	1,237	11	11	0.9	0.9	0.9
24-Mar-2023	1,257	1,260	3	3	0.2	0.2	0.2
25-Mar-2023	1,165	1,141	-24	24	-2.1	2.1	-2.1
26-Mar-2023	1,115	1,107	-8	8	-0.7	0.7	-0.7
27-Mar-2023	1,164	1,156	-8	8	-0.7	0.7	-0.7
28-Mar-2023	1,131	1,124	-7	7	-0.6	0.6	-0.6
29-Mar-2023	1,157	1,144	-13	13	-1.2	1.2	-1.2
30-Mar-2023	1,165	1,142	-23	23	-2.0	2.0	-2.0
31-Mar-2023	1,169	1,141	-28	28	-2.4	2.4	-2.5
Minimum	1,064	1,039	-57	0	-5.2	0.0	-5.5
Average	1,212	1,211	0	18	-0.1	1.5	-0.1
Maximum	1,559	1,559	116	116	9.3	9.3	8.5

[37] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-14: Analysis of Utility Forecast Error for April 2023[38]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Apr-2023	1,018	1,042	23	23	2.3	2.3	2.2
2-Apr-2023	982	976	-6	6	-0.6	0.6	-0.6
3-Apr-2023	1,088	1,134	46	46	4.2	4.2	4.0
4-Apr-2023	1,161	1,145	-15	15	-1.3	1.3	-1.3
5-Apr-2023	1,093	1,096	3	3	0.3	0.3	0.3
6-Apr-2023	1,179	1,212	33	33	2.8	2.8	2.7
7-Apr-2023	**1,042**	**972**	**-69**	**69**	**-6.6**	**6.6**	**-7.1**
8-Apr-2023	1,079	1,115	36	36	3.4	3.4	3.3
9-Apr-2023	1,105	1,147	42	42	3.8	3.8	3.6
10-Apr-2023	1,160	1,157	-3	3	-0.3	0.3	-0.3
11-Apr-2023	975	1,019	44	44	4.5	4.5	4.3
12-Apr-2023	938	935	-3	3	-0.3	0.3	-0.3
13-Apr-2023	1,001	972	-29	29	-2.9	2.9	-2.9
14-Apr-2023	987	973	-14	14	-1.4	1.4	-1.4
15-Apr-2023	939	967	28	28	3.0	3.0	2.9
16-Apr-2023	**857**	**939**	**82**	**82**	**9.6**	**9.6**	**8.7**
17-Apr-2023	1,022	995	-27	27	-2.6	2.6	-2.7
18-Apr-2023	1,042	1,070	28	28	2.7	2.7	2.6
19-Apr-2023	1,065	1,041	-24	24	-2.3	2.3	-2.3
20-Apr-2023	1,013	1,001	-12	12	-1.2	1.2	-1.2
21-Apr-2023	1,058	1,018	-40	40	-3.8	3.8	-4.0
22-Apr-2023	**1,024**	**961**	**-63**	**63**	**-6.1**	**6.1**	**-6.5**
23-Apr-2023	1,018	1,006	-12	12	-1.1	1.1	-1.2
24-Apr-2023	1,040	1,039	-2	2	-0.2	0.2	-0.2
25-Apr-2023	1,039	1,032	-7	7	-0.7	0.7	-0.7
26-Apr-2023	1,023	1,024	1	1	0.1	0.1	0.1
27-Apr-2023	1,027	1,001	-26	26	-2.5	2.5	-2.6
28-Apr-2023	1,031	1,022	-8	8	-0.8	0.8	-0.8
29-Apr-2023	989	973	-16	16	-1.6	1.6	-1.6
30-Apr-2023	946	945	-1	1	-0.1	0.1	-0.1
Minimum	857	935	-69	1	-6.6	0.1	-7.1
Average	1,031	1,031	0	25	0.0	2.4	-0.1
Maximum	1,179	1,212	82	82	9.6	9.6	8.7

[38] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-15: Analysis of Utility Forecast Error for May 2023[39]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-May-2023	1,030	1,038	8	8	0.8	0.8	0.8
2-May-2023	1,004	1,005	1	1	0.1	0.1	0.1
3-May-2023	970	972	2	2	0.2	0.2	0.2
4-May-2023	940	940	-1	1	-0.1	0.1	-0.1
5-May-2023	**1,023**	**960**	**-63**	**63**	**-6.2**	**6.2**	**-6.6**
6-May-2023	947	925	-23	23	-2.4	2.4	-2.4
7-May-2023	868	880	12	12	1.4	1.4	1.4
8-May-2023	862	880	18	18	2.1	2.1	2.1
9-May-2023	940	904	-35	35	-3.8	3.8	-3.9
10-May-2023	932	947	15	15	1.6	1.6	1.6
11-May-2023	890	904	14	14	1.5	1.5	1.5
12-May-2023	840	848	8	8	0.9	0.9	0.9
13-May-2023	739	758	19	19	2.6	2.6	2.6
14-May-2023	809	773	-36	36	-4.4	4.4	-4.6
15-May-2023	856	865	9	9	1.1	1.1	1.1
16-May-2023	811	803	-7	7	-0.9	0.9	-0.9
17-May-2023	784	770	-15	15	-1.9	1.9	-1.9
18-May-2023	826	837	11	11	1.3	1.3	1.3
19-May-2023	817	824	7	7	0.8	0.8	0.8
20-May-2023	723	732	9	9	1.3	1.3	1.2
21-May-2023	**641**	**682**	**42**	**42**	**6.5**	**6.5**	**6.1**
22-May-2023	**741**	**780**	**38**	**38**	**5.2**	**5.2**	**4.9**
23-May-2023	877	871	-6	6	-0.7	0.7	-0.7
24-May-2023	871	878	8	8	0.9	0.9	0.9
25-May-2023	797	785	-12	12	-1.5	1.5	-1.5
26-May-2023	892	894	2	2	0.3	0.3	0.3
27-May-2023	785	775	-10	10	-1.2	1.2	-1.2
28-May-2023	695	711	17	17	2.4	2.4	2.4
29-May-2023	801	790	-11	11	-1.3	1.3	-1.3
30-May-2023	851	857	5	5	0.6	0.6	0.6
31-May-2023	773	758	-14	14	-1.9	1.9	-1.9
Minimum	641	682	-63	1	-6.2	0.1	-6.6
Average	849	850	0	15	0.2	1.9	0.1
Maximum	1,030	1,038	42	63	6.5	6.5	6.1

[39] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-16: Analysis of Utility Forecast Error for June 2023[40]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Jun-2023	734	728	-5	5	-0.7	0.7	-0.7
2-Jun-2023	755	749	-5	5	-0.7	0.7	-0.7
3-Jun-2023	**858**	**785**	**-73**	**73**	**-8.5**	**8.5**	**-9.3**
4-Jun-2023	836	810	-26	26	-3.2	3.2	-3.3
5-Jun-2023	823	843	19	19	2.3	2.3	2.3
6-Jun-2023	811	783	-28	28	-3.4	3.4	-3.5
7-Jun-2023	765	787	22	22	2.9	2.9	2.8
8-Jun-2023	711	724	13	13	1.9	1.9	1.9
9-Jun-2023	685	682	-2	2	-0.3	0.3	-0.4
10-Jun-2023	**788**	**701**	**-88**	**88**	**-11.1**	**11.1**	**-12.5**
11-Jun-2023	768	744	-24	24	-3.1	3.1	-3.2
12-Jun-2023	840	847	8	8	0.9	0.9	0.9
13-Jun-2023	784	792	9	9	1.1	1.1	1.1
14-Jun-2023	769	762	-7	7	-0.9	0.9	-0.9
15-Jun-2023	700	706	6	6	0.9	0.9	0.9
16-Jun-2023	772	756	-16	16	-2.0	2.0	-2.1
17-Jun-2023	704	684	-20	20	-2.8	2.8	-2.9
18-Jun-2023	740	707	-34	34	-4.6	4.6	-4.8
19-Jun-2023	801	806	5	5	0.6	0.6	0.6
20-Jun-2023	786	788	2	2	0.2	0.2	0.2
21-Jun-2023	798	792	-6	6	-0.7	0.7	-0.7
22-Jun-2023	**589**	**636**	**48**	**48**	**8.1**	**8.1**	**7.5**
23-Jun-2023	594	622	28	28	4.7	4.7	4.5
24-Jun-2023	565	565	1	1	0.1	0.1	0.1
25-Jun-2023	614	587	-27	27	-4.4	4.4	-4.6
26-Jun-2023	655	690	35	35	5.4	5.4	5.1
27-Jun-2023	634	660	26	26	4.1	4.1	3.9
28-Jun-2023	605	626	21	21	3.5	3.5	3.3
29-Jun-2023	615	612	-4	4	-0.6	0.6	-0.6
30-Jun-2023	608	612	4	4	0.7	0.7	0.7
Minimum	565	565	-88	1	-11.1	0.1	-12.5
Average	724	720	-4	20	-0.3	2.8	-0.5
Maximum	858	847	48	88	8.1	11.1	7.5

[40] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-17: Analysis of Utility Forecast Error for July 2023[41]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Jul-2023	567	557	-10	10	-1.7	1.7	-1.8
2-Jul-2023	563	563	0	0	0.0	0.0	0.0
3-Jul-2023	618	600	-18	18	-2.9	2.9	-3.0
4-Jul-2023	**627**	**595**	**-32**	**32**	**-5.0**	**5.0**	**-5.3**
5-Jul-2023	603	610	7	7	1.1	1.1	1.1
6-Jul-2023	600	597	-3	3	-0.6	0.6	-0.6
7-Jul-2023	583	595	11	11	2.0	2.0	1.9
8-Jul-2023	565	556	-10	10	-1.7	1.7	-1.7
9-Jul-2023	560	566	6	6	1.1	1.1	1.1
10-Jul-2023	598	625	27	27	4.5	4.5	4.3
11-Jul-2023	607	607	0	0	0.1	0.1	0.1
12-Jul-2023	595	601	6	6	1.1	1.1	1.1
13-Jul-2023	**598**	**560**	**-39**	**39**	**-6.5**	**6.5**	**-6.9**
14-Jul-2023	601	596	-5	5	-0.9	0.9	-0.9
15-Jul-2023	572	551	-21	21	-3.7	3.7	-3.8
16-Jul-2023	574	568	-6	6	-1.0	1.0	-1.0
17-Jul-2023	632	613	-19	19	-3.0	3.0	-3.1
18-Jul-2023	638	617	-20	20	-3.2	3.2	-3.3
19-Jul-2023	634	624	-10	10	-1.6	1.6	-1.6
20-Jul-2023	634	625	-10	10	-1.5	1.5	-1.5
21-Jul-2023	620	620	0	0	0.0	0.0	0.0
22-Jul-2023	599	570	-30	30	-4.9	4.9	-5.2
23-Jul-2023	596	589	-7	7	-1.2	1.2	-1.2
24-Jul-2023	639	635	-4	4	-0.7	0.7	-0.7
25-Jul-2023	637	617	-20	20	-3.2	3.2	-3.3
26-Jul-2023	633	620	-14	14	-2.2	2.2	-2.2
27-Jul-2023	611	613	2	2	0.2	0.2	0.2
28-Jul-2023	592	617	24	24	4.1	4.1	3.9
29-Jul-2023	560	556	-4	4	-0.7	0.7	-0.7
30-Jul-2023	585	580	-5	5	-0.9	0.9	-0.9
31-Jul-2023	577	617	40	40	7.0	7.0	6.5
Minimum	560	551	-39	0	-6.5	0.0	-6.9
Average	601	595	-5	13	-0.8	2.2	-0.9
Maximum	639	635	40	40	7.0	7.0	6.5

[41] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-18: Analysis of Utility Forecast Error for August 2023

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Aug-2023	587	586	-2	2	-0.3	0.3	-0.3
2-Aug-2023	575	579	4	4	0.6	0.6	0.6
3-Aug-2023	575	584	9	9	1.6	1.6	1.6
4-Aug-2023	579	582	3	3	0.5	0.5	0.5
5-Aug-2023	545	541	-4	4	-0.8	0.8	-0.8
6-Aug-2023	573	563	-10	10	-1.7	1.7	-1.7
7-Aug-2023	589	598	10	10	1.6	1.6	1.6
8-Aug-2023	588	589	1	1	0.2	0.2	0.2
9-Aug-2023	586	589	3	3	0.5	0.5	0.5
10-Aug-2023	622	601	-21	21	-3.4	3.4	-3.5
11-Aug-2023	576	590	14	14	2.4	2.4	2.3
12-Aug-2023	566	550	-15	15	-2.7	2.7	-2.8
13-Aug-2023	542	558	17	17	3.1	3.1	3.0
14-Aug-2023	586	587	0	0	0.1	0.1	0.1
15-Aug-2023	588	586	-3	3	-0.4	0.4	-0.4
16-Aug-2023	580	582	2	2	0.3	0.3	0.3
17-Aug-2023	565	586	21	21	3.7	3.7	3.6
18-Aug-2023	566	573	7	7	1.2	1.2	1.2
19-Aug-2023	561	545	-16	16	-2.8	2.8	-2.9
20-Aug-2023	573	558	-15	15	-2.5	2.5	-2.6
21-Aug-2023	596	601	5	5	0.9	0.9	0.9
22-Aug-2023	587	584	-3	3	-0.6	0.6	-0.6
23-Aug-2023	576	580	4	4	0.7	0.7	0.7
24-Aug-2023	580	584	4	4	0.7	0.7	0.7
25-Aug-2023	562	580	17	17	3.0	3.0	3.0
26-Aug-2023	533	540	7	7	1.3	1.3	1.2
27-Aug-2023	559	548	-11	11	-2.0	2.0	-2.1
28-Aug-2023	593	584	-9	9	-1.5	1.5	-1.5
29-Aug-2023	576	575	-1	1	-0.2	0.2	-0.2
30-Aug-2023	598	582	-16	16	-2.7	2.7	-2.8
31-Aug-2023	602	598	-4	4	-0.6	0.6	-0.6
Minimum	533	540	-21	0	-3.4	0.1	-3.5
Average	577	577	0	8	0.0	1.4	0.0
Maximum	622	601	21	21	3.7	3.7	3.6

Table A-19: Analysis of Utility Forecast Error for September 2023[42]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Sep-2023	594	583	-11	11	-1.8	1.8	-1.9
2-Sep-2023	546	538	-8	8	-1.4	1.4	-1.4
3-Sep-2023	**520**	**556**	**36**	**36**	**6.9**	**6.9**	**6.5**
4-Sep-2023	557	548	-10	10	-1.8	1.8	-1.8
5-Sep-2023	583	556	-26	26	-4.5	4.5	-4.8
6-Sep-2023	595	572	-23	23	-3.9	3.9	-4.0
7-Sep-2023	605	583	-22	22	-3.6	3.6	-3.7
8-Sep-2023	570	589	19	19	3.4	3.4	3.3
9-Sep-2023	561	535	-27	27	-4.7	4.7	-5.0
10-Sep-2023	578	560	-18	18	-3.1	3.1	-3.2
11-Sep-2023	593	586	-7	7	-1.2	1.2	-1.3
12-Sep-2023	598	584	-14	14	-2.3	2.3	-2.4
13-Sep-2023	575	582	7	7	1.2	1.2	1.2
14-Sep-2023	590	584	-6	6	-0.9	0.9	-1.0
15-Sep-2023	572	589	17	17	3.0	3.0	2.9
16-Sep-2023	570	549	-21	21	-3.8	3.8	-3.9
17-Sep-2023	601	569	-32	32	-5.3	5.3	-5.6
18-Sep-2023	596	589	-7	7	-1.2	1.2	-1.3
19-Sep-2023	**633**	**597**	**-36**	**36**	**-5.7**	**5.7**	**-6.0**
20-Sep-2023	584	593	8	8	1.4	1.4	1.4
21-Sep-2023	635	620	-15	15	-2.3	2.3	-2.3
22-Sep-2023	674	697	23	23	3.4	3.4	3.3
23-Sep-2023	653	627	-26	26	-4.0	4.0	-4.2
24-Sep-2023	606	605	-1	1	-0.2	0.2	-0.2
25-Sep-2023	698	701	3	3	0.4	0.4	0.4
26-Sep-2023	737	723	-14	14	-1.9	1.9	-1.9
27-Sep-2023	703	687	-16	16	-2.3	2.3	-2.3
28-Sep-2023	**646**	**686**	**40**	**40**	**6.2**	**6.2**	**5.9**
29-Sep-2023	690	682	-8	8	-1.1	1.1	-1.1
30-Sep-2023	590	600	11	11	1.8	1.8	1.8
Minimum	520	535	-36	1	-5.7	0.2	-6.0
Average	608	602	-6	17	-1.0	2.8	-1.1
Maximum	737	723	40	40	6.9	6.9	6.5

[42] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-20: Analysis of Utility Forecast Error for October 2023[43]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Oct-2023	591	582	-9	9	-1.5	1.5	-1.5
2-Oct-2023	609	598	-11	11	-1.7	1.7	-1.8
3-Oct-2023	635	628	-7	7	-1.2	1.2	-1.2
4-Oct-2023	704	720	17	17	2.3	2.3	2.3
5-Oct-2023	760	745	-15	15	-2.0	2.0	-2.0
6-Oct-2023	659	642	-17	17	-2.6	2.6	-2.6
7-Oct-2023	601	598	-3	3	-0.5	0.5	-0.5
8-Oct-2023	629	617	-12	12	-1.9	1.9	-1.9
9-Oct-2023	671	661	-10	10	-1.5	1.5	-1.5
10-Oct-2023	639	650	11	11	1.8	1.8	1.7
11-Oct-2023	621	632	11	11	1.8	1.8	1.7
12-Oct-2023	649	646	-3	3	-0.5	0.5	-0.5
13-Oct-2023	647	631	-16	16	-2.5	2.5	-2.6
14-Oct-2023	662	624	-38	38	-5.7	5.7	-6.1
15-Oct-2023	620	641	21	21	3.4	3.4	3.3
16-Oct-2023	**767**	**688**	**-79**	**79**	**-10.3**	**10.3**	**-11.5**
17-Oct-2023	801	827	25	25	3.2	3.2	3.1
18-Oct-2023	862	861	-1	1	-0.2	0.2	-0.2
19-Oct-2023	791	795	3	3	0.4	0.4	0.4
20-Oct-2023	712	716	4	4	0.6	0.6	0.6
21-Oct-2023	**721**	**668**	**-53**	**53**	**-7.3**	**7.3**	**-7.9**
22-Oct-2023	**691**	**646**	**-45**	**45**	**-6.5**	**6.5**	**-6.9**
23-Oct-2023	813	822	9	9	1.1	1.1	1.1
24-Oct-2023	864	868	3	3	0.4	0.4	0.4
25-Oct-2023	843	837	-6	6	-0.7	0.7	-0.7
26-Oct-2023	737	769	32	32	4.3	4.3	4.1
27-Oct-2023	807	814	7	7	0.9	0.9	0.9
28-Oct-2023	787	740	-47	47	-5.9	5.9	-6.3
29-Oct-2023	813	818	4	4	0.5	0.5	0.5
30-Oct-2023	923	932	9	9	1.0	1.0	1.0
31-Oct-2023	937	946	9	9	0.9	0.9	0.9
Minimum	591	582	-79	1	-10.3	0.2	-11.5
Average	728	721	-7	17	-1.0	2.4	-1.1
Maximum	937	946	32	79	4.3	10.3	4.1

[43] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-21: Analysis of Utility Forecast Error for November 2023[44]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Nov-2023	994	1,000	6	6	0.6	0.6	0.6
2-Nov-2023	1,001	1,004	3	3	0.3	0.3	0.3
3-Nov-2023	1,019	1,037	18	18	1.7	1.7	1.7
4-Nov-2023	885	862	-24	24	-2.7	2.7	-2.7
5-Nov-2023	861	839	-21	21	-2.5	2.5	-2.5
6-Nov-2023	**982**	**1,036**	**54**	**54**	**5.6**	**5.6**	**5.3**
7-Nov-2023	1,022	1,009	-13	13	-1.2	1.2	-1.2
8-Nov-2023	937	941	4	4	0.4	0.4	0.4
9-Nov-2023	988	959	-29	29	-2.9	2.9	-3.0
10-Nov-2023	1,010	1,010	0	0	0.0	0.0	0.0
11-Nov-2023	1,024	1,051	27	27	2.6	2.6	2.6
12-Nov-2023	1,051	1,091	40	40	3.8	3.8	3.7
13-Nov-2023	1,120	1,107	-13	13	-1.2	1.2	-1.2
14-Nov-2023	1,100	1,079	-21	21	-1.9	1.9	-1.9
15-Nov-2023	1,104	1,091	-12	12	-1.1	1.1	-1.1
16-Nov-2023	1,096	1,094	-2	2	-0.2	0.2	-0.2
17-Nov-2023	1,017	1,021	5	5	0.5	0.5	0.5
18-Nov-2023	877	870	-7	7	-0.8	0.8	-0.8
19-Nov-2023	877	883	6	6	0.7	0.7	0.7
20-Nov-2023	1,029	1,066	37	37	3.6	3.6	3.5
21-Nov-2023	1,099	1,116	17	17	1.5	1.5	1.5
22-Nov-2023	1,149	1,141	-7	7	-0.6	0.6	-0.6
23-Nov-2023	1,150	1,140	-10	10	-0.9	0.9	-0.9
24-Nov-2023	972	987	15	15	1.6	1.6	1.5
25-Nov-2023	1,137	1,151	14	14	1.3	1.3	1.2
26-Nov-2023	**1,131**	**1,072**	**-60**	**60**	**-5.3**	**5.3**	**-5.6**
27-Nov-2023	1,095	1,087	-8	8	-0.7	0.7	-0.7
28-Nov-2023	1,018	985	-33	33	-3.2	3.2	-3.3
29-Nov-2023	1,117	1,083	-34	34	-3.1	3.1	-3.2
30-Nov-2023	1,154	1,148	-6	6	-0.5	0.5	-0.5
Minimum	861	839	-60	0	-5.3	0.0	-5.6
Average	1,034	1,032	-2	18	-0.2	1.8	-0.2
Maximum	1,154	1,151	54	60	5.6	5.6	5.3

[44] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-22: Analysis of Utility Forecast Error for December 2023[45]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
1-Dec-2023	1,142	1,141	-2	2	-0.1	0.1	-0.1
2-Dec-2023	1,017	1,059	42	42	4.1	4.1	3.9
3-Dec-2023	1,095	1,146	52	52	4.7	4.7	4.5
4-Dec-2023	1,183	1,165	-19	19	-1.6	1.6	-1.6
5-Dec-2023	1,167	1,187	19	19	1.7	1.7	1.6
6-Dec-2023	1,243	1,304	61	61	4.9	4.9	4.6
7-Dec-2023	1,273	1,261	-12	12	-0.9	0.9	-1.0
8-Dec-2023	1,252	1,241	-12	12	-0.9	0.9	-0.9
9-Dec-2023	1,231	1,252	21	21	1.7	1.7	1.7
10-Dec-2023	1,151	1,128	-23	23	-2.0	2.0	-2.0
11-Dec-2023	1,125	1,132	7	7	0.6	0.6	0.6
12-Dec-2023	967	1,011	44	44	4.6	4.6	4.4
13-Dec-2023	1,120	1,146	26	26	2.3	2.3	2.3
14-Dec-2023	1,285	1,296	11	11	0.9	0.9	0.9
15-Dec-2023	1,265	1,266	1	1	0.1	0.1	0.1
16-Dec-2023	1,235	1,189	-46	46	-3.7	3.7	-3.9
17-Dec-2023	1,230	1,203	-26	26	-2.2	2.2	-2.2
18-Dec-2023	1,080	1,091	12	12	1.1	1.1	1.1
19-Dec-2023	**917**	**997**	**80**	**80**	**8.7**	**8.7**	**8.0**
20-Dec-2023	**897**	**961**	**64**	**64**	**7.1**	**7.1**	**6.7**
21-Dec-2023	992	1,010	18	18	1.8	1.8	1.8
22-Dec-2023	1,148	1,140	-8	8	-0.7	0.7	-0.7
23-Dec-2023	1,243	1,229	-15	15	-1.2	1.2	-1.2
24-Dec-2023	1,175	1,182	6	6	0.5	0.5	0.5
25-Dec-2023	1,214	1,196	-18	18	-1.5	1.5	-1.5
26-Dec-2023	**1,108**	**1,180**	**72**	**72**	**6.5**	**6.5**	**6.1**
27-Dec-2023	1,237	1,263	26	26	2.1	2.1	2.0
28-Dec-2023	1,230	1,224	-6	6	-0.5	0.5	-0.5
29-Dec-2023	1,308	1,293	-15	15	-1.2	1.2	-1.2
30-Dec-2023	1,166	1,161	-4	4	-0.4	0.4	-0.4
31-Dec-2023	1,168	1,231	63	63	5.4	5.4	5.1
Minimum	897	961	-46	1	-3.7	0.1	-3.9
Average	1,157	1,170	14	27	1.4	2.4	1.3
Maximum	1,308	1,304	80	80	8.7	8.7	8.0

[45] Lines that have been bolded indicate further examination of the hourly forecast provided in this report.

Table A-23: Monthly Peak Utility Load Error Summary – Average Error

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
Feb 2023	1,557	1,550	-7	30	-0.5	1.9	-0.5
Mar 2023	1,212	1,211	0	18	-0.1	1.5	-0.1
Apr 2023	1,031	1,031	0	25	0.0	2.4	-0.1
May 2023	849	850	0	15	0.2	1.9	0.1
Jun 2023	724	720	-4	20	-0.3	2.8	-0.5
Jul 2023	601	595	-5	13	-0.8	2.2	-0.9
Aug 2023	577	577	0	8	0.0	1.4	0.0
Sep 2023	608	602	-6	17	-1.0	2.8	-1.1
Oct 2023	728	721	-7	17	-1.0	2.4	-1.1
Nov 2023	1,034	1,032	-2	18	-0.2	1.8	-0.2
Dec 2023	1,157	1,170	14	27	1.4	2.4	1.3
Total Average	916	915	-2	19	-0.2	2.1	-0.3

Table A-24: Monthly Peak Utility Load Error Summary – Maximum Statistics[46]

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
Feb 2023	1,622	1,658	36	38	2.2	2.6	2.2
Mar 2023	1,559	1,559	116	116	9.3	9.3	8.5
Apr 2023	1,179	1,212	82	82	9.6	9.6	8.7
May 2023	1,030	1,038	42	63	6.5	6.5	6.1
Jun 2023	858	847	48	88	8.1	11.1	7.5
Jul 2023	639	635	40	40	7.0	7.0	6.5
Aug 2023	622	601	21	21	3.7	3.7	3.6
Sep 2023	737	723	40	40	6.9	6.9	6.5
Oct 2023	937	946	32	79	4.3	10.3	4.1
Nov 2023	1,154	1,151	54	60	5.6	5.6	5.3
Dec 2023	1,308	1,304	80	80	8.7	8.7	8.0
Annual	1,059	1,061	54	64	6.5	7.4	6.1

[46] The maximum forecast, the maximum peak, and the maximum error do not necessarily occur on the same day.

Table A-25: Error in Ten Highest Utility Loads

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Absolute Error (%)	Actual/ Forecast (%)
27-Feb-2023	1,622	1,658	36	36	2.2	2.2	2.2
24-Feb-2023	1,615	1,603	-12	12	-0.7	0.7	-0.7
28-Feb-2023	1,582	1,615	33	33	2.1	2.1	2.1
1-Mar-2023	1,559	1,559	0	0	0.0	0.0	0.0
26-Feb-2023	1,547	1,523	-24	24	-1.5	1.5	-1.6
25-Feb-2023	1,540	1,502	-38	38	-2.5	2.5	-2.5
2-Mar-2023	1,511	1,497	-13	13	-0.9	0.9	-0.9
23-Feb-2023	1,437	1,401	-37	37	-2.6	2.6	-2.6
3-Mar-2023	1,368	1,404	36	36	2.6	2.6	2.6
29-Dec-2023	1,308	1,293	-15	15	-1.2	1.2	-1.2
Average	1,509	1,506	-3	24	-0.2	1.6	-0.3

Table A-26: Summary of Forecast Issues

Date	Actual Utility Peak (MW)	Forecast Utility Peak (MW)	Error (MW)	Absolute Error (MW)	Error (%)	Explanation
4-Mar-2023	1,242	1357	116	116	9.3	Actual weather differed from forecast values/within acceptable limits at peak
19-Mar-2023	1,096	1039	-57	57	-5.2	Actual weather differed from forecast values
7-Apr-2023	1,042	972	-69	69	-6.6	Non-uniform customer behaviour
16-Apr-2023	857	939	82	82	9.6	Actual weather differed from forecast values
22-Apr-2023	1,024	961	-63	63	-6.1	Ongoing work on the EMS system
5-May-2023	1,023	960	-63	63	-6.2	Actual weather differed from forecast values
21-May-2023	641	682	42	42	6.5	Actual weather differed from forecast values
22-May-2023	741	780	38	38	5.2	Non-uniform customer behaviour
3-Jun-2023	858	785	-73	73	-8.5	Error in weather data
10-Jun-2023	788	701	-88	88	-11.1	Actual weather differed from forecast values
22-Jun-2023	589	636	48	48	8.1	Actual weather differed from forecast values /within acceptable limits at peak
4-Jul-2023	627	595	-32	32	-5.0	Actual weather differed from forecast values
13-Jul-2023	598	560	-39	39	-6.5	Actual weather differed from forecast values /underestimate by load forecasting software
3-Sep-2023	520	556	36	36	6.9	Actual weather differed from forecast values
19-Sep-2023	633	597	-36	36	-5.7	Actual weather differed from forecast values
28-Sep-2023	646	686	40	40	6.2	Overestimate by load forecasting software/within acceptable limits at peak
16-Oct-2023	767	688	-79	79	-10.3	Actual weather differed from forecast values
21-Oct-2023	721	668	-53	53	-7.3	Non-uniform customer behaviour
22-Oct-2023	691	646	-45	45	-6.5	Non-uniform customer behaviour
6-Nov-2023	982	1036	54	54	5.6	Overestimate by load forecasting software/within acceptable limits at peak
26-Nov-2023	1,131	1,072	-60	60	-5.3	Actual weather differed from forecast values
19-Dec-2023	917	997	80	80	8.7	Actual weather differed from forecast values
20-Dec-2023	897	961	64	64	7.1	Actual weather differed from forecast values
26-Dec-2023	1,108	1180	72	72	6.5	Non-uniform customer behaviour

Appendix B

Supporting Charts

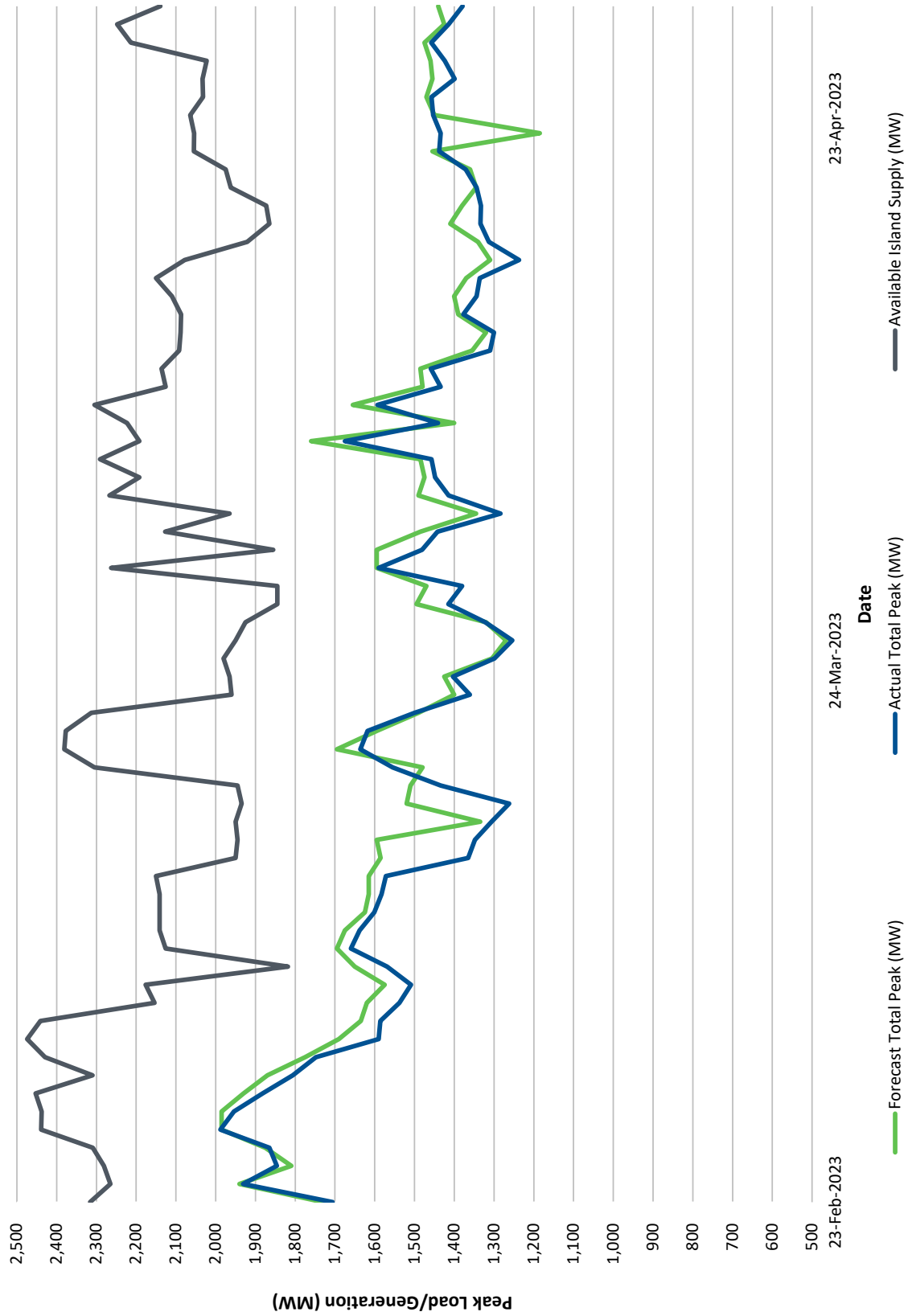

Chart B-1: Peak Forecast, Total Load, and Available Supply from February 23, 2023 through April 2023

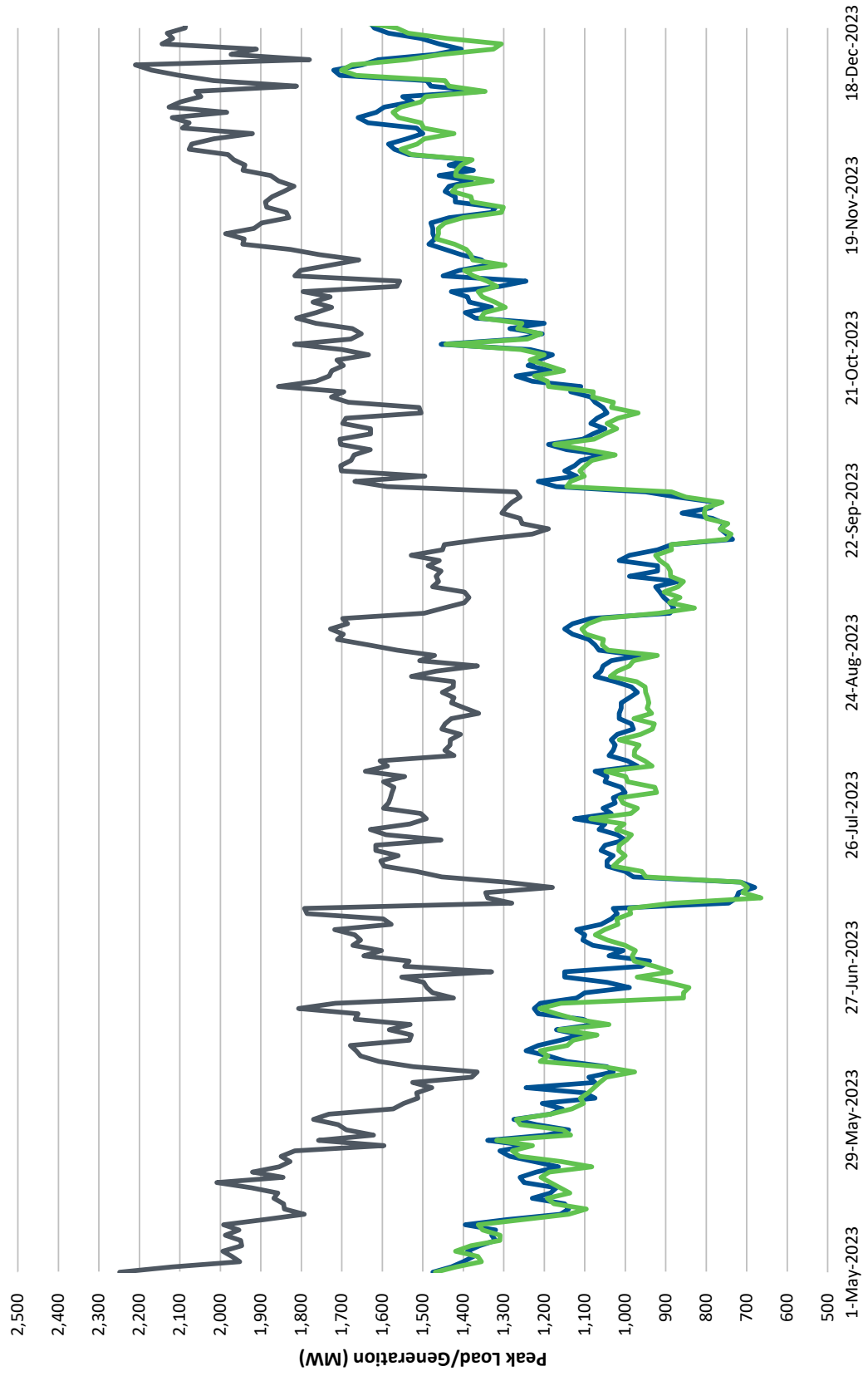

Chart B-2: Peak Forecast, Total Load, and Available Supply from May 2023 through December 2023

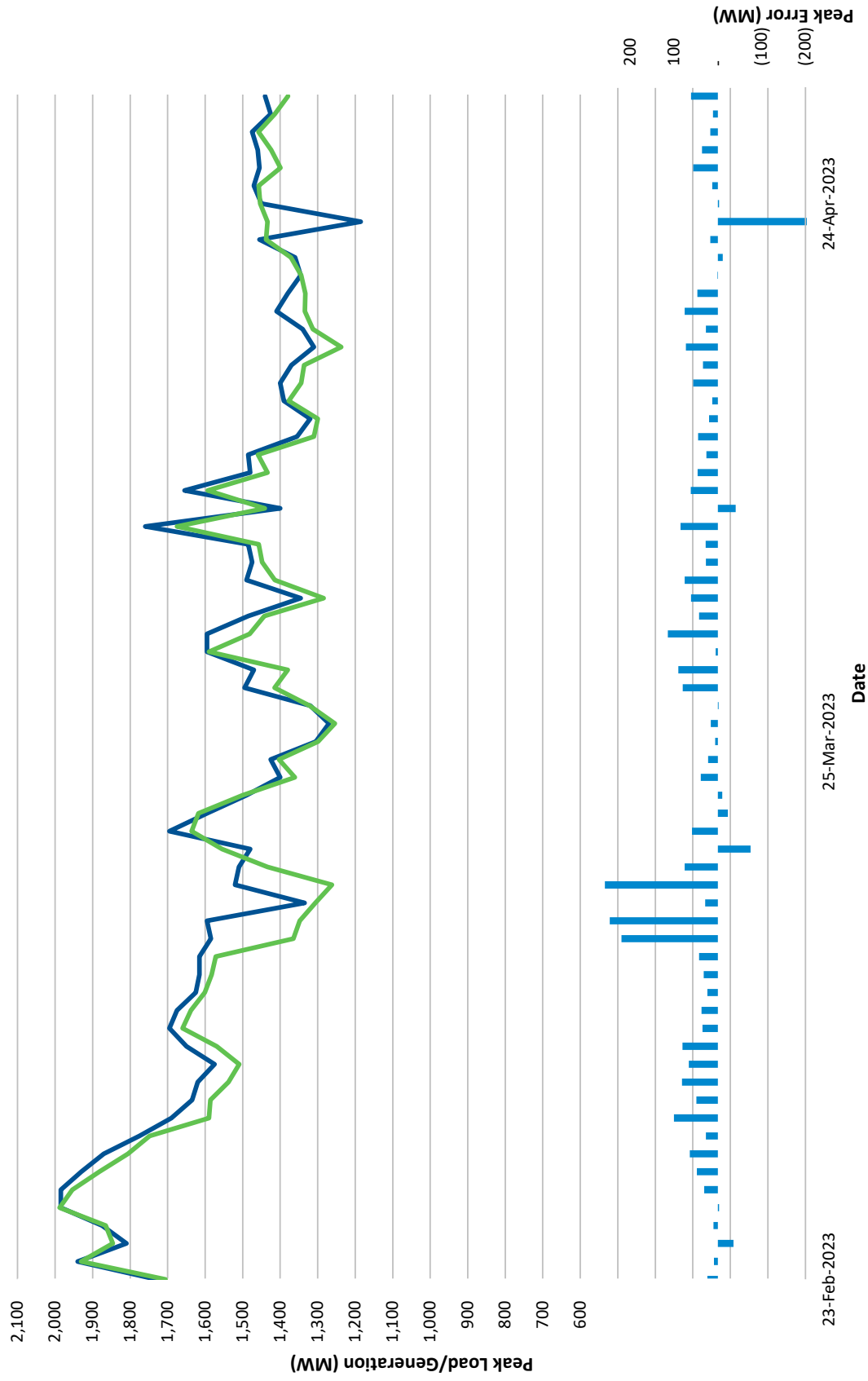

Chart B-3: Peak Forecast, Total Load, and Error from February 23, 2023 through April 2023

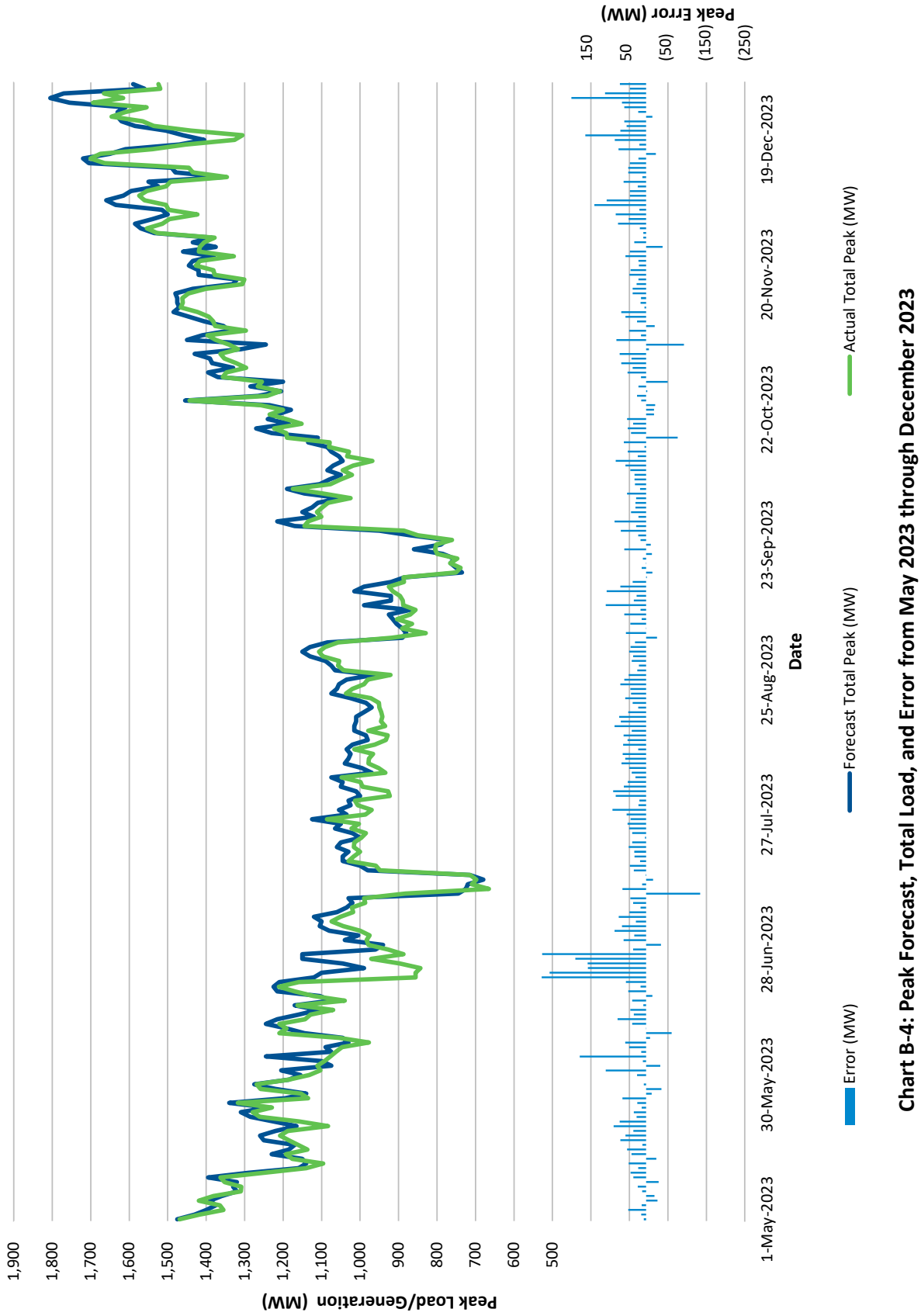

Chart B-4: Peak Forecast, Total Load, and Error from May 2023 through December 2023

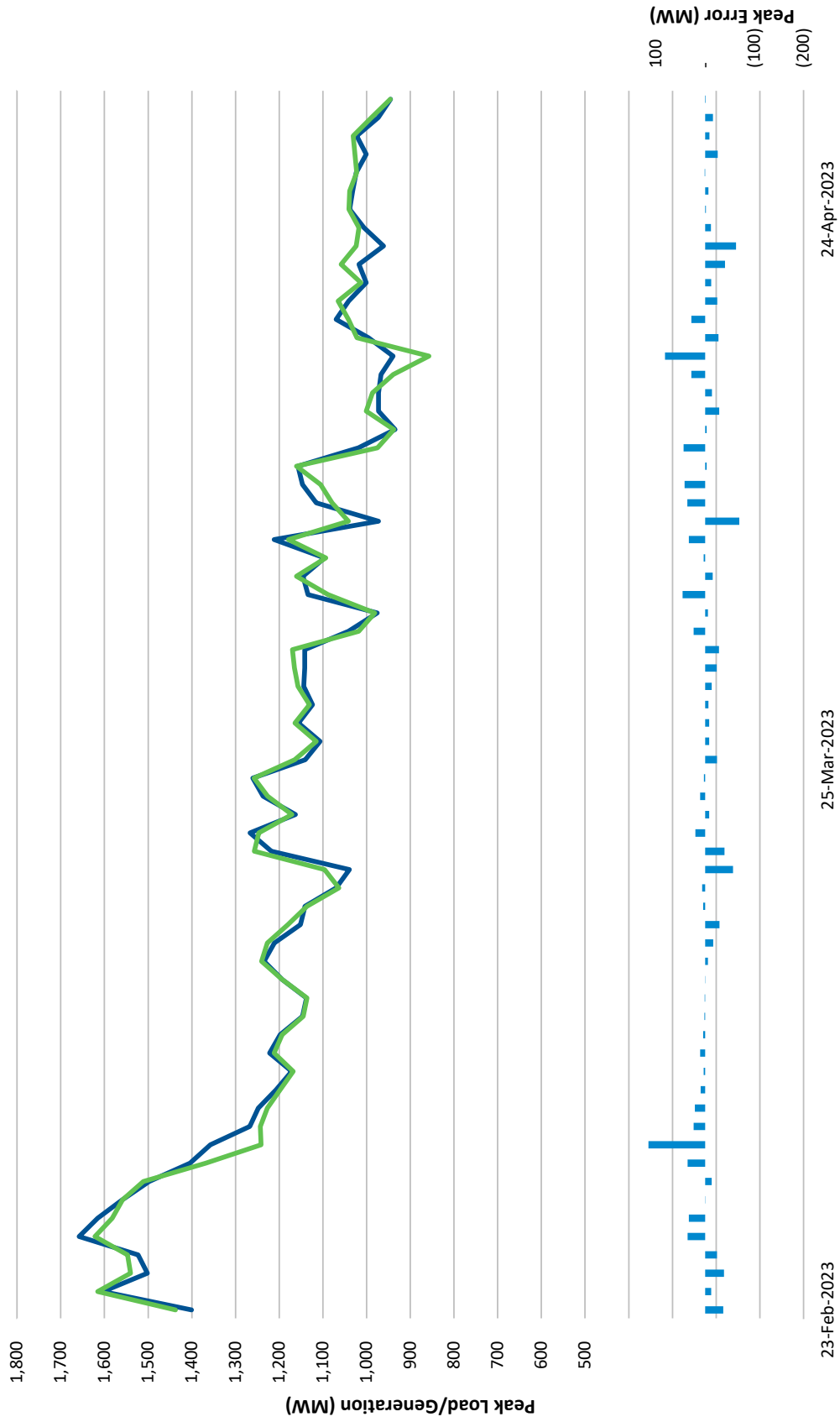

Chart B-5: Peak Forecast, Utility Load, and Error from February 23, 2023 through April 2023

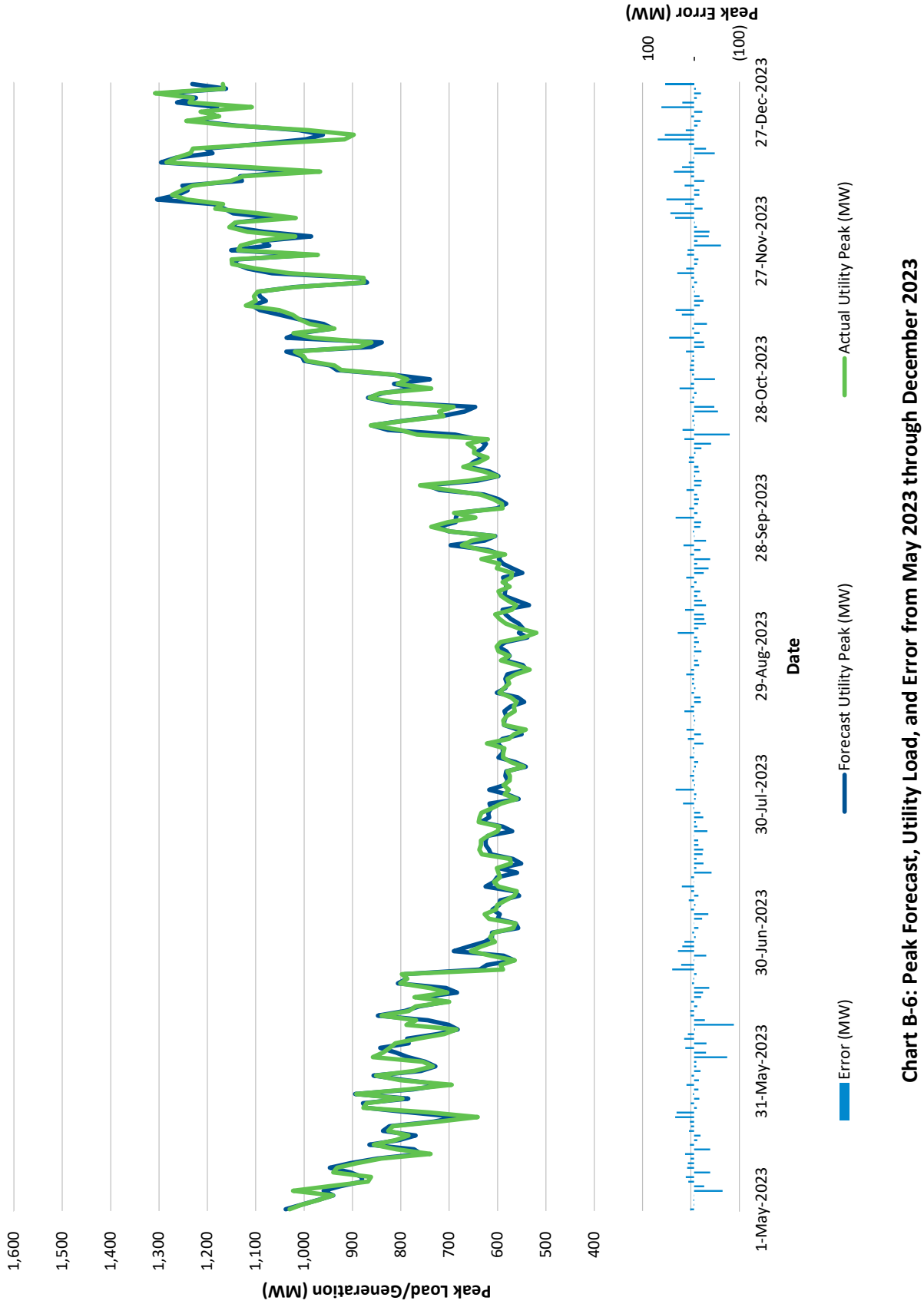

Chart B-6: Peak Forecast, Utility Load, and Error from May 2023 through December 2023