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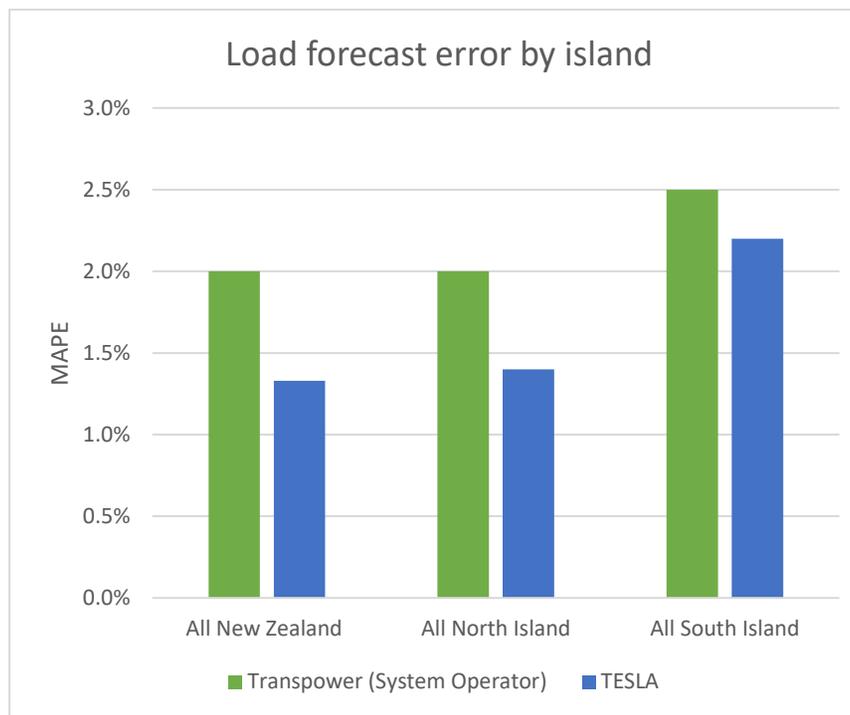www.teslaforecast.com
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TESLA load forecasts continue to outperform the System Operator's over tricky shoulder month

This report compares both the load forecasts provided by TESLA via EMS' em[6] and the System Operator's load forecast (at 2.5 hours ahead of real-time) against actual load observations. As does the report released by Transpower, this report seeks to separate out the conforming loads for further analysis.[1] EMS provides a detailed load forecasting accuracy analysis to all Load Forecast users on a monthly basis.[2]

Load forecast error by island

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[1] The System Operator's load forecast accuracy report can be found here: https://www.transpower.co.nz/sites/default/files/bulk-upload/documents/201704%20Load%20Forecast%20Accuracy.pdf

[2] For more information on the em[6] Load Forecast: http://ems.co.nz/portfolio/energy-information/loadforecast

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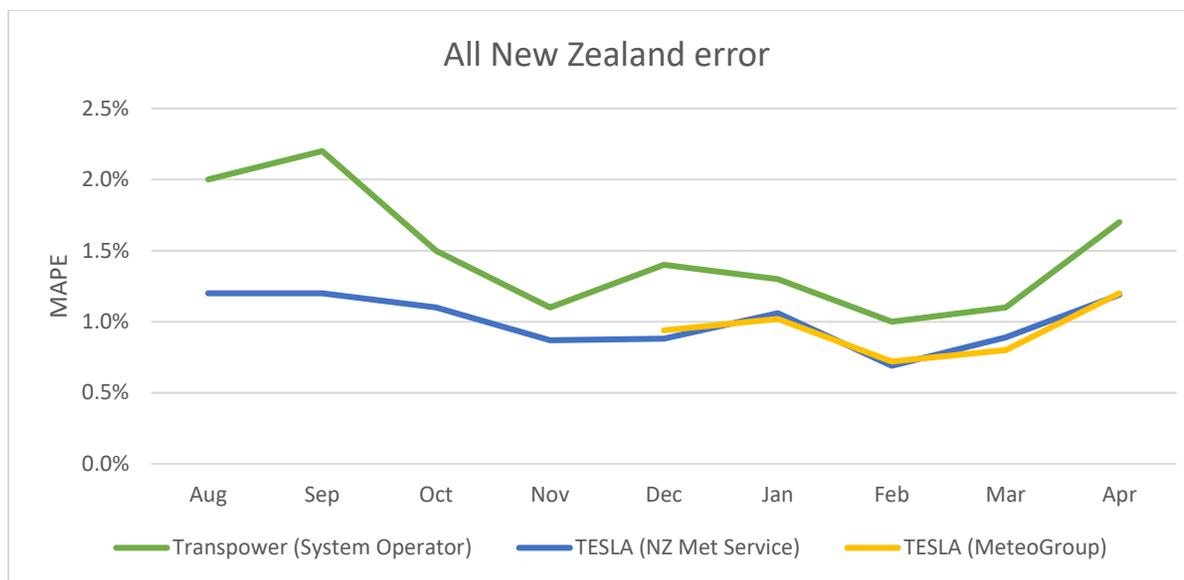www.teslaforecast.com
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April is a challenging month for forecasting in New Zealand for the following reasons:

- Daylight Saving Time ended on the 2nd of April. The transition in and out of DST can be challenging for two reasons:
    1. The quality of the load data tends to be lower than usual on the timechange day. We suspect there is a greater likelihood of measurement error during the transition.
    2. To accommodate for the clocks turning backward 1 hour, the TESLA model shifts from the summer to winter model. In addition to accommodating for the timechange, the use of separate summer and winter models allows for better forecasting of extreme weather events: the days of highest interest. There can be increased forecasting uncertainty around this model transition.
- There is lower confidence in forecasting on and around holidays as there simply aren't many observed holidays in the sample. Generally you want at least 30 observations for each variable – which of course is impossible for holidays unless you have 30 years of demand data.
    1. The four day Easter weekend spanned from 14 – 17 April 2017.
    2. Anzac day occurred on Tuesday, 25 April 2017. There are strong surrounding day effects as well. For example, many decide to take off the Monday as well. The last time Anzac day landed on a Tuesday was in 2006. Many loads are structurally different today than they were in 2006.

To further complicate things, recall that on 30 April 2007 the government announced that it had extended the daylight savings period from 24 to 27 weeks. This not only 'adds' 3 additional weeks to the summer model, but also now forces Easter into the winter model. This means that we cannot use pre-2008 Easter coefficients to enhance our forecast.

There is potential for further improvement if demand response data become available to the public domain. Although the TESLA model currently uses data mining to learn when demand response events may occur, there is room for improvement if demand response data become an input to the model.

The graph below shows the comparison of the TESLA and System Operator load forecasts since August 2016. The blue curve shows the MAPE of the TESLA forecast 2.5 hours ahead using weather forecasts provided by the NZ Met Service while the yellow curve shows that of weather forecasts provided by MeteoGroup. As the weather forecast is the primary input to the load forecast, it's good practice to observe how the resulting load forecasts vary under different weather vendors. Confidence will be high when the resulting load forecasts line up while further attention will be required when they diverge.

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This report confirms that the TESLA load forecasts via em[6] significantly outperform the load forecasts published by the System Operator. The System Operator's forecasting error increased by over 50% from March to April 2017 whereas TESLA's increased by a third. This increased error was expected due to April's complexities as described above. The key takeaway here is that the System Operator's average monthly error jumped significantly more than TESLA's did. This average error has been inflated greatly due to forecasting around the complexities of April. The System Operator's high forecasting errors around the timechange, Easter and Anzac day can be seen in the 'Load forecast accuracy by date' chart located here.[3] Complex days like these are when accurate load forecasting matters most.

A free trial is available for industry participants to assess the added value of the TESLA load forecasts over the System Operator's. Please contact TESLA Asia Pacific for more information: asiapacific@teslaforecast.com +64 (0) 9 551 5039

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[3] https://www.transpower.co.nz/sites/default/files/bulk-upload/documents/201704%20Load%20Forecast%20Accuracy.pdf