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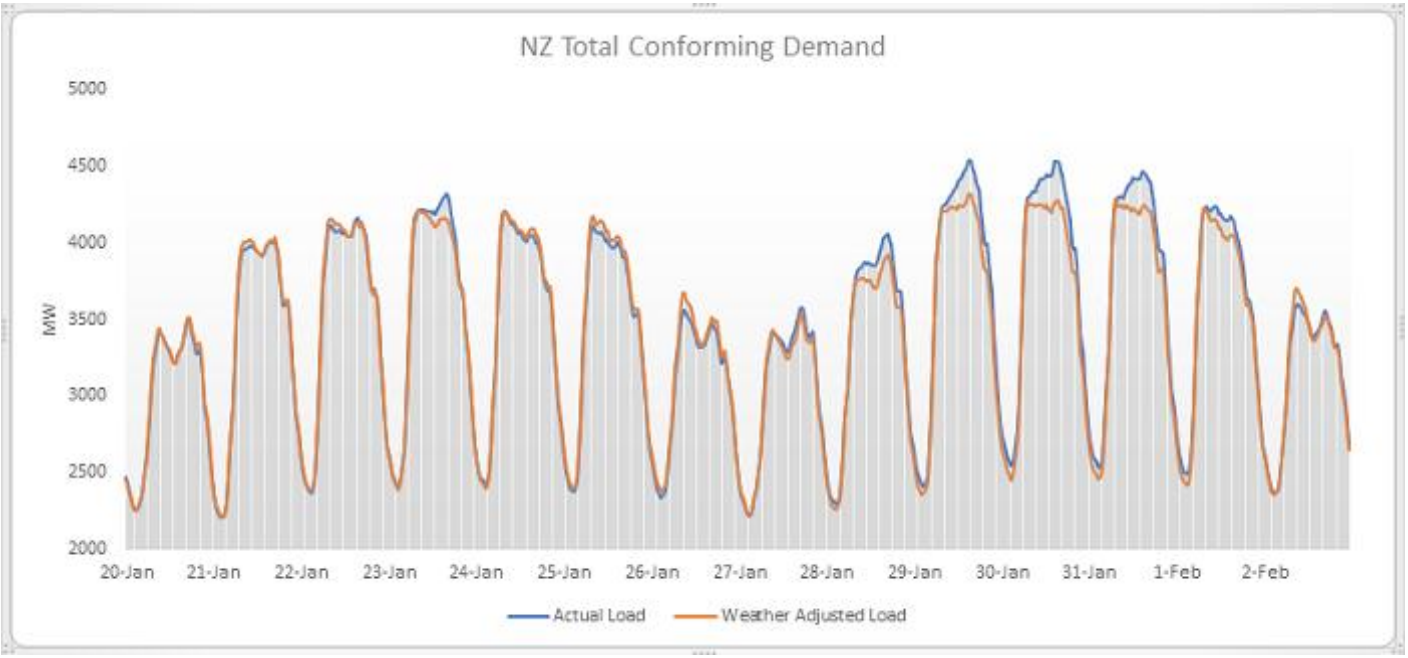
NZ hits summer demand high

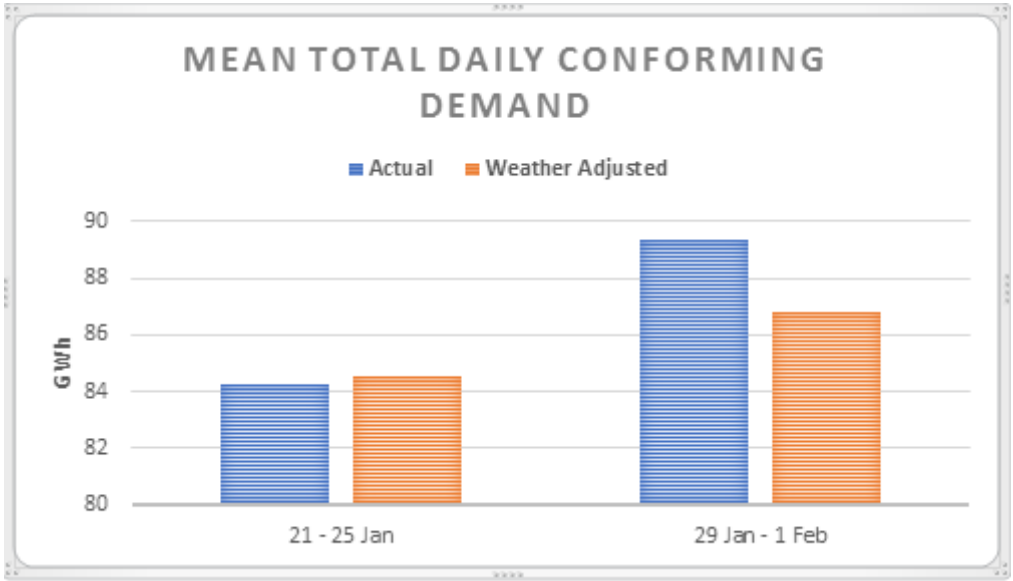
Mark Todoroff - Fri, 08 Feb 2019

New Zealand is a winter electricity peaking system, but it also sees some very high demand days in the middle of summer. The three extremely hot days last week (Tuesday 29 January to Thursday 31 January) set the highest total demand days during summer months since 1996, according to TESLA Asia Pacific's data. This report analyses weather's effect on demand last week and the previous week. We restricted the analysis to load from conforming grid-exit points since we are primarily concerned about weather-sensitive demand.



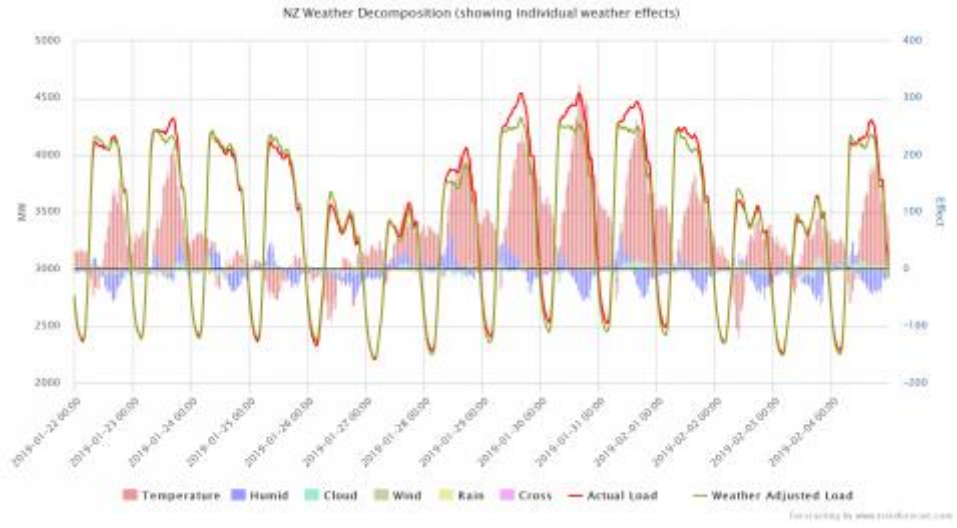
School year boost

The average NZ daily total conforming demand over January 29 to February 1 was 6.1 per cent higher than the previous week. However, the average NZ daily total weather-adjusted demand over those days was only 2.7 per cent higher than the previous week. This means only 3.4 per cent of last week's 6.1 per cent increase can be explained by weather. The remaining 2.7 per cent is caused by other factors. A significant portion of that remaining non-weather impact comes from the start of the school year. School terms have a considerable impact on the time and level of the morning and evening ramp-ups. Note that Auckland Anniversary Day (Monday, 28 Jan) was excluded from this comparison.



Weather's Effect on Demand

Temperature, humidity, cloud cover, wind speed/direction, and precipitation have a significant impact on power consumption. Temperature has the largest impact. Below you can see the overwhelming cooling demand illustrated by the red bars. Relative to seasonally normalised weather, air conditioning demand contributed more than 300 MW of additional power demand on January 30. Humidity is also a strong driver of demand as periods of both high heat and humidity not only create higher perceived temperatures, but also make air conditioning units less efficient. It can be seen by the blue bars below that humidity had a negative effect throughout the heatwave. This implies power demand would have been even higher if it been more humid. Cloud cover can have a cooling/insulation effect and can be used as a proxy for embedded solar PV generation (i.e. negative demand). High winds can create a cooling effect in the summer whereas in the winter they can strip heat away from buildings faster than if the winds were calmer, resulting in the opposite effect on load. Rainfall is especially important in irrigation-heavy regions where the variable is a proxy for soil moisture.



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