

The Impact of Assumptions on the ERCs

In other [SOS101s](#) we have discussed the treatment of each assumption used in the modelling of the Electricity Risk Curves (ERCs). In this 101 we'll discuss the impact these assumptions can have on the shape of the ERCs. The ERCs are updated usually once a month (more frequently if required), and can be very different when compared to the previous update depending on which assumptions are changed.

It is important to remember when assessing the impacts of changes that the risk for each month is calculated by modelling out for one year from that month. Therefore an input that is scheduled to change in the future will impact ERC values ahead of this change.

The key assumptions that can influence the shape of the ERCs are listed below, including links to their associated SOS101s:

Thermal fuels

Including a thermal de-rating due to restricted thermal fuel supply will increase the ERCs. More hydro generation is required to meet demand when thermal generation is restricted. The increased water consumption that is required to avoid an energy shortage causes the electricity risk curves to increase.

Demand forecast

We usually update the demand forecast values used in the ERCs in February/March each year. If the forecast predicts higher demand, the ERCs will increase, and vice versa for a lower demand forecast. A higher demand forecast will mean a greater demand on generation, and more dependency on hydro storage and generation for managing security of supply events.

Generation assumptions

Adding a new generator will decrease the ERCs as more generation becomes available to meet demand. In a similar way, increasing generator capacities will decrease the ERCs.

Generator outages

This is the assumption that is updated most regularly, and is the primary reason for *business-as-usual* changes in the shape of the ERCs. The ERCs will increase compared to the previous month's update if there are more outages to be included, and decrease if there are less outages to be included. Large longer outages will have more impact than small shorter outages. Outages for each month are published in the [assumptions spreadsheet](#).

Transmission assumptions

Generally Alternating Current (AC) network constraints do not have a large impact on the ERC. This is because while limits on the AC network may constrain generation on or off during peak periods or in certain situations, over time the impact of the AC network generally allows a free flow of electricity.

This is not the case for the High Voltage Direct Current (HVDC) link between the North and South islands. As the majority of hydro generation is in the South Island, and the majority of thermal generation in the North Island, the capacity, and any outages that effect this capacity, of the HVDC link will impact the ERCs. HVDC capacity, like generation capacity, if increased will lower the ERCs, and vice versa. Similarly, outages on the HVDC link will increase the ERCs.

Each month when the ERCs are updated, there can be any combination of changes to the input assumptions. This can make it difficult to determine the impact of a single change in isolation as we only see the overall increase or decrease to the

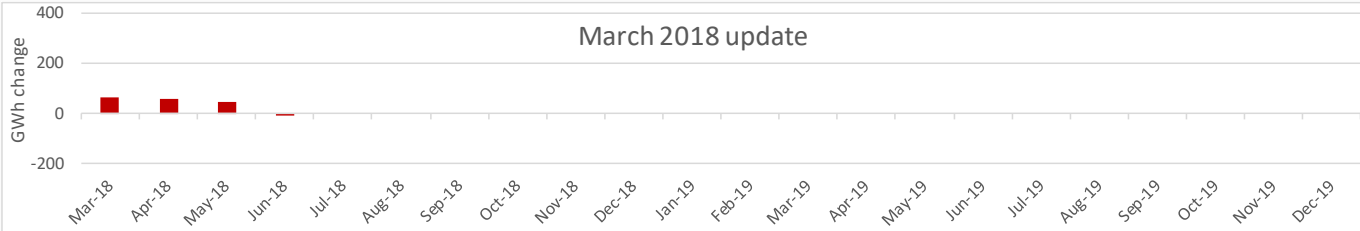
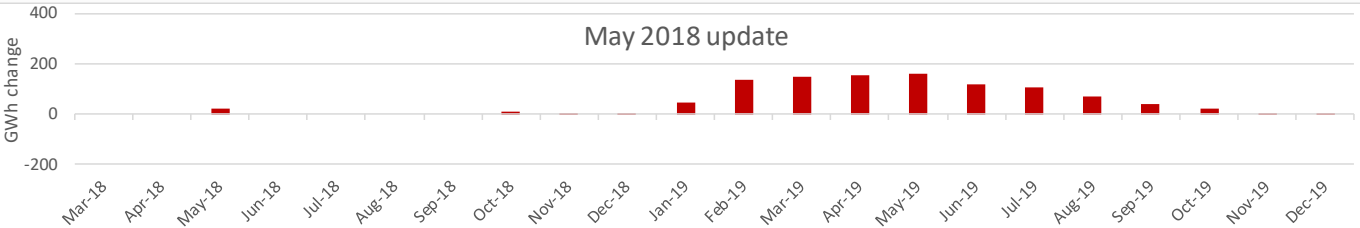
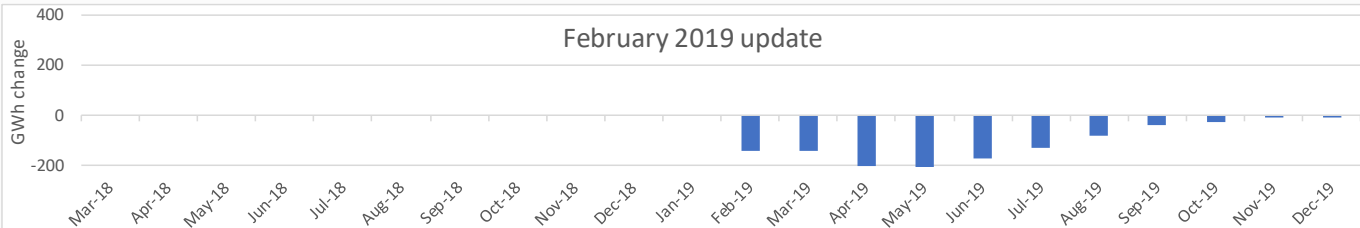
curves. Summaries of some previous ERC updates are shown in Table 1, and the overall GWh changes to the 10% ERC per month has been included in charts in the table for comparison.

The **March 2018** update shows a business-as-usual update where any new generation outages are included, but all other assumptions remain unchanged. The major outages included for the first time in this month's update were up to 200MW at Stratford Peakers from 23/04/2018 to 8/05/2018 and 250MW at Huntly Rankines from 3/05/2018 to 7/05/2019. This resulted in an increase of up to 64 GWh in the 10% ERC for March 2018.

The **May 2018** update included a new demand forecast in a response to the announcement that the Tiwai smelter was restarting their 4th potline in November 2018. This increase in demand caused an increase in the ERCs of up to 159 GWh in the 10% ERC for May 2019. The impact of updated generator outages can also be seen in the chart for the May 2018 update in Table 1, with a slight increase to the 10% ERC in May 2018.

Many changes were made in the **February 2019** ERC update, but the overall change to the curves was dominated by the new demand forecast. The new demand forecast was lower than the one previously used in the ERC modelling, and thus the curves decreased; up to 208 GWh in the 10% ERC for May 2019. A thermal de-rating was included for the first time in this monthly update as an outage to one CCGT for 8 days in March 2019 and 8 days in April 2019. This de-rating increased the ERCs in those months, but the overall change to the ERCs was a decrease due to the dominating impact of the demand forecast update.

Table 1: Historic updates to the ERCs

Month of update	Description of update	Change in 10% ERC when compared to the previous update																																														
March 2018	Updated generation outages for the next two months.	<div><div>March 2018 update</div><table><thead><tr><th>Month</th><th>GWh change</th></tr></thead><tbody><tr><td>Mar-18</td><td>50</td></tr><tr><td>Apr-18</td><td>50</td></tr><tr><td>May-18</td><td>50</td></tr><tr><td>Jun-18</td><td>-10</td></tr><tr><td>Jul-18</td><td>0</td></tr><tr><td>Aug-18</td><td>0</td></tr><tr><td>Sep-18</td><td>0</td></tr><tr><td>Oct-18</td><td>0</td></tr><tr><td>Nov-18</td><td>0</td></tr><tr><td>Dec-18</td><td>0</td></tr><tr><td>Jan-19</td><td>0</td></tr><tr><td>Feb-19</td><td>0</td></tr><tr><td>Mar-19</td><td>0</td></tr><tr><td>Apr-19</td><td>0</td></tr><tr><td>May-19</td><td>0</td></tr><tr><td>Jun-19</td><td>0</td></tr><tr><td>Jul-19</td><td>0</td></tr><tr><td>Aug-19</td><td>0</td></tr><tr><td>Sep-19</td><td>0</td></tr><tr><td>Oct-19</td><td>0</td></tr><tr><td>Nov-19</td><td>0</td></tr><tr><td>Dec-19</td><td>0</td></tr></tbody></table></div>	Month	GWh change	Mar-18	50	Apr-18	50	May-18	50	Jun-18	-10	Jul-18	0	Aug-18	0	Sep-18	0	Oct-18	0	Nov-18	0	Dec-18	0	Jan-19	0	Feb-19	0	Mar-19	0	Apr-19	0	May-19	0	Jun-19	0	Jul-19	0	Aug-19	0	Sep-19	0	Oct-19	0	Nov-19	0	Dec-19	0
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