VESTAS - SHORT TERM FORECASTING OF WIND FARMS

LESSONS LEART REPORT #1 (OCTOBER 2019)

Key Lessons
The initial project plan anticipated a shorter duration for establishing the infrastructure connectivity using the API and get to a stable state for the forecast submittal via this API. Future deployment should allow for additional time to test and stabilize the self-forecast pipeline. Additionally, allowing for longer operational runtime allowed the system to collect critical information regarding both the reliability of the forecast submittal as well as different operating conditions of the farms that may impact the forecast accuracy. A good understanding of the potential operational constraints for instance can help further refine the forecast model accuracy. The team will continue to leverage the results observed to improve subsequent releases of the forecast model. Similarly, while the team focused on making the infrastructure resilient to ensure high availability of the self-forecast, the need for additional monitoring of the infrastructure was identified and deployed to strengthen the 24/7 operational support. The assessment condition stating that any AEMO constraint on a park that is equal to the park's forecasted AWEFS availability will not be excluded from the MAE/RMSE calculation should be revised. This condition will favour the AWEFS when the actual availability and self-forecast availability is higher than the AWEFS availability, as the actual MW will directly follow the AWEFS availability due to the constraint limiting the park. The assessment would be more reflective of self-forecasting reliability over AWEFS reliability if all periods that an AEMO constraint is applied to the park are excluded from the assessment. In conjunction to the above, the assessment condition that 80% of periods must be available for the forecast should also be revised. As, over the last 20 days, AEMO constraints (where the constraint was both less than or equal to the AWEFS availability), were binding at Lake Bonney 3 for over 24% of the periods. Therefore, if Lake Bonney were to suppress the forecast where AEMO is constraining the park to its AWEFS maximum availability, then the trial might not pass the condition that forecast data must cover 80% of the trial period. An additional assessment condition that should be revised is that self-forecast values must be positive. While AWEFS also provides only positive values, and therefore should not affect the MAE/RMSE comparison between the two values, it is still believed that accurate, negative value forecasts can be produced for the parks.

Implications for Future Projects

Infigen now has an API platform for channelling information to and from AEMO's environment. This will be beneficial moving forward as AEMO move more of their communications into APIs.

Knowledge Gaps Identified

API integration was more challenging than anticipated. Lack of knowledge in how to interact with AEMO's environment meant that resource was spent trying to apply principles typically used in other software integrations.

Infigen were unaware of the password requirements and password acceptance/rejection criteria required to access AEMO's new E-hub Rest API via the older Web Services API which resulted in periods where no forecast data was being sent to AEMO. Troubleshooting via trial and error identified this problem and revealed that the old API does not accept passwords more than 20 characters long which resulted in further delay.

Moreover, as Infigen has multiple DUIDs registered under a single participant, the addition of the API platform allowed Infigen greater security that forecast providers could only submit self-forecasts for the specific DUIDs they were providing the service for and not the full participant. While this gives Infigen control and monitoring over the data being submitted on behalf of Infigen's participants, it does add additional complexity to the submission process.

Also, time was spent working through the intricacies of both the SCADA data available from the Lake Bonney wind farms and AEMO's dispatch systems. This was necessary to be able to forecast accurately through numerous non 'business-as-usual' scenarios.

It was also challenging anticipating curtailed time period for the two farms.