Short-Term Forecasting Trial: AEMO Intermittent Generator Forum

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Agenda

- Background
- Project update
- Knowledge Sharing update
  - GHD - Knowledge Sharing Agent
- Next steps
- Questions

Short-term Forecasting trial

In 2019, ARENA awarded $9.41 million to 11 project recipients to trial short-term forecasting at large-scale wind and solar farms across Australia.

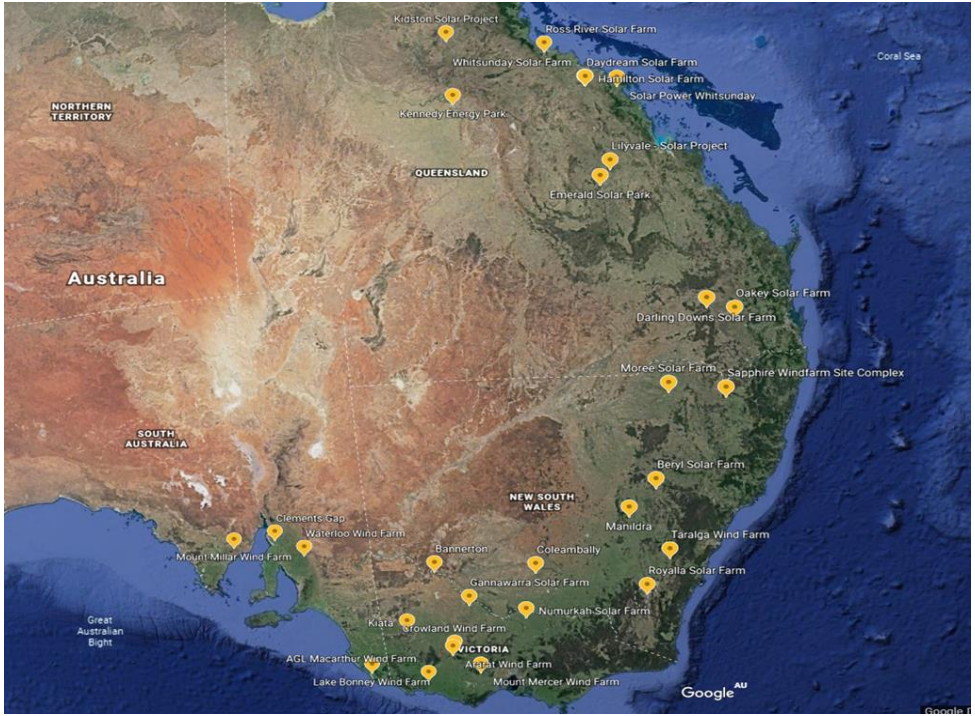
The portfolio of projects involves a range of weather forecasting technologies including:

- onsite cloud cameras that can predict the timing and impact of a passing clouds on a solar farm
- wind speed radars
- weather satellites
- infrared
- crunching of Bureau of Meteorology data and machine learning algorithms.

Image: Vestas

Where are the projects located?

The trial comprises **35%** of the NEM's registered large-scale wind and solar capacity, and collectively includes a total of around **3 GW** of renewable electricity generation.



Project share by state and funding recipient

Proponent	NSW	QLD	SA	VIC	Grand Total
Advisian		1	1		2
Aeolius				1	1
DNV GL				1	1
Fulcrum 3D (Wind)	1		1	1	3
Fulcrum 3D & Proa Analytics		1			1
IMC	1	3			4
IMC & Solcast				1	1
Meridian				1	1
Proa Analytics		1		1	2
Solcast	3	3		1	7
Vestas			2		2
Windlab		1		1	2
Grand Total	**5**	**10**	**4**	**8**	**27**

Project Objectives

Demonstrate the ability for:

- NEM based Semi-scheduled Generators to submit five-minute ahead self-forecasts via AEMO's web based API
- self-forecasting to be more accurate than the equivalent forecast produced by the Australian Wind Energy Forecasting System (AWEFS) or Australian Solar Energy Forecasting System (ASEFS)
- the potential commercial benefits of Market Semi-scheduled Generators investing in forecasting approaches

Image: Fulcrum 3D

Knowledge Sharing Objectives

Contribute to industry knowledge sharing by:

- Examining factors that affect the accuracy of the forecasting approach trialed. e.g. in different weather, operational conditions, geographies and technologies

- Share details about the commercial and technical readiness of forecasting providers and technologies with industry

Demonstrate the ability to submit five-minute ahead self-forecasts via AEMO's web based API

Successes

- 21 sites now accredited and providing forecasts to AEMO
  - All showing improvements on AWEFS and ASEFS in certain periods

Challenges

- 6 sites are not submitting forecasts
  - Non-trial forecasters
- Still some issues with API connectivity

Demonstrate self-forecasting to be more accurate than the AWEFS or ASEFS

Successes

- 9 of 11 projects have demonstrated or modeled improvements

Challenges

- Sky cams
- Real time site data/SCADA connectivity
- Modeling is hard

Lessons learnt

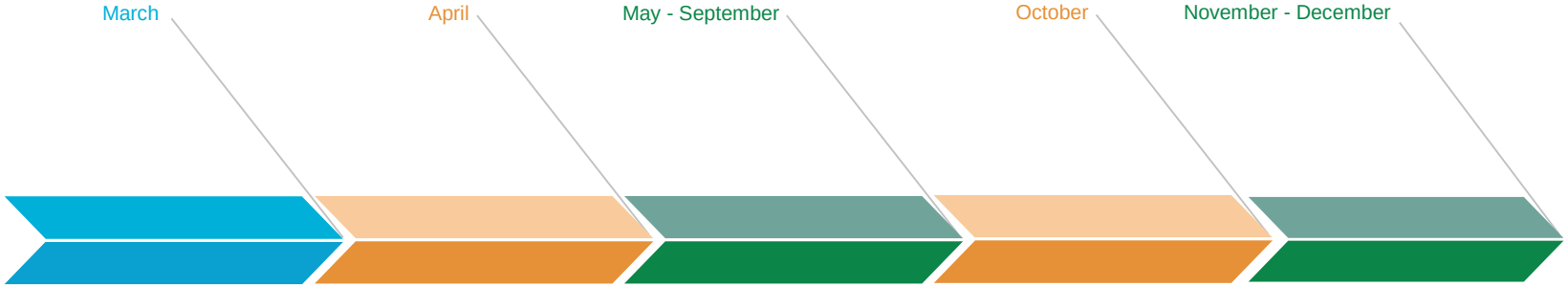
- Solcast - highly variable cloud cover is difficult to forecast, and is a problem more associated with tropical weather patterns in Queensland
- Meridian - LIDAR users should be aware that poor visibility is often associated with high power generation fluctuations
- Proa - self cleaning systems can overcome *some* soiling issues

Demonstrate potential commercial benefits of Market Semi-scheduled Generators investing in STF

Success

- A number of participants have shown that Causer Pays charges can be reduced to zero in certain time periods
  - Savings of 66% of the total amount of causer pays costs reported
- The more sites that accurately self-forecast, the more FCAS charges will decrease

Timeline for 2020



AEMO Forum & ARENA Workshop

Progress & Lessons Learnt Reports

Progress Report (confidential)

Lessons Learnt Report (Public)

3 / 28 sites completed in the trial

Progress & Lessons Learnt Reports

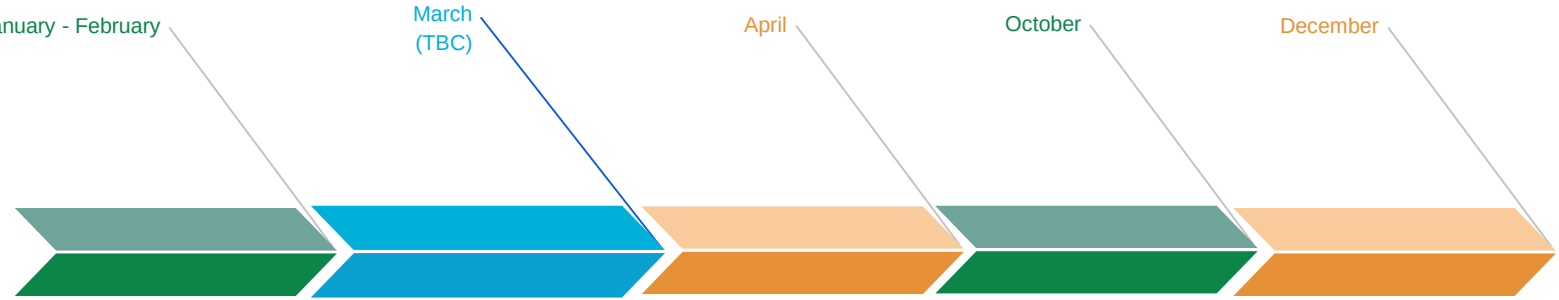
Progress Report (confidential)

Lessons Learnt Report (Public)

12 / 28 sites completed trial AEMO Forum

Timing subject to project variations

Timeline for 2021



24 / 26 sites complete

AEMO Forum & ARENA Workshop

Opportunity to meet and collaborate on the future design of self forecasting in the NEM

Progress & Lessons Learnt Reports due

Progress Report (confidential)

Lessons Learnt Report (Public)

Progress & Lessons Learnt Reports due

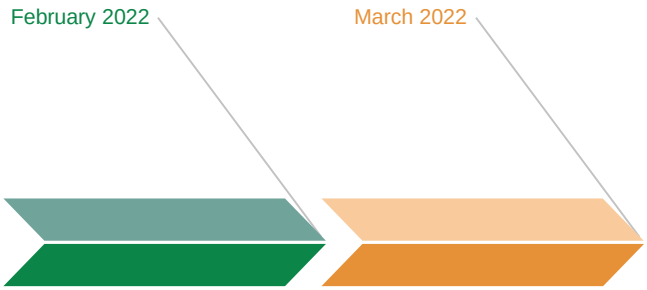
Progress Report (confidential)

Lessons Learnt Report (Public)

25 / 26 sites complete

Timing subject to project variations

Timeline for 2022



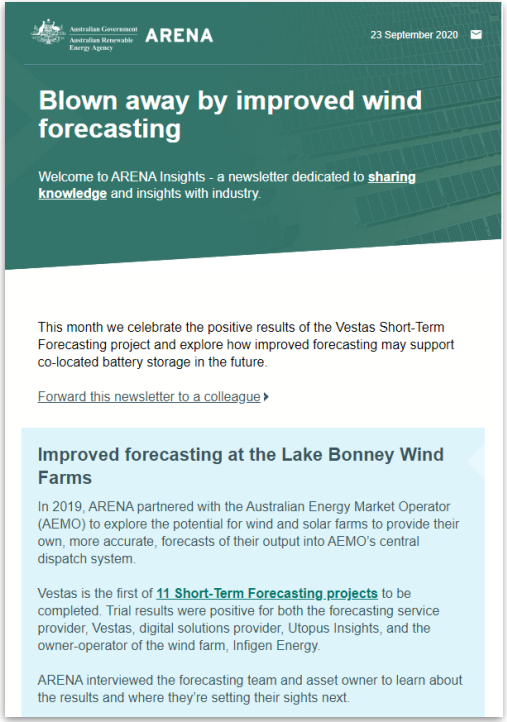
26 / 26 sites complete

Final ARENA report and wrap up of trial

Timing subject to project variations

Analytic data collected on 24/11/20

Knowledge Sharing Update - Newsletter Analytics



Australian Government Australian Renewable Energy Agency ARENA

23 September 2020

Blown away by improved wind forecasting

Welcome to ARENA Insights - a newsletter dedicated to **sharing knowledge** and insights with industry.

This month we celebrate the positive results of the Vestas Short-Term Forecasting project and explore how improved forecasting may support co-located battery storage in the future.

Forward this newsletter to a colleague ›

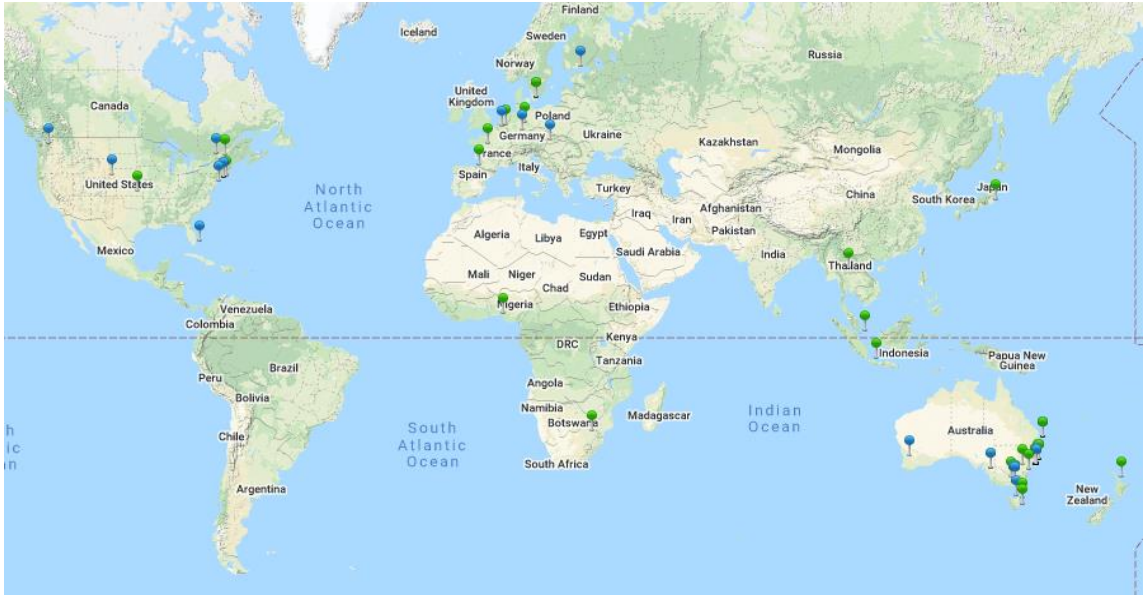
Improved forecasting at the Lake Bonney Wind Farms

In 2019, ARENA partnered with the Australian Energy Market Operator (AEMO) to explore the potential for wind and solar farms to provide their own, more accurate, forecasts of their output into AEMO's central dispatch system.

Vestas is the first of **11 Short-Term Forecasting projects** to be completed. Trial results were positive for both the forecasting service provider, Vestas, digital solutions provider, Utopus Insights, and the owner-operator of the wind farm, Infigen Energy.

ARENA interviewed the forecasting team and asset owner to learn about the results and where they're setting their sights next.

The trial's progress was featured in the ARENA Insights Newsletter (September 2020) with 683 unique opens



GHD Knowledge Sharing Agent

- Enlisted to provide technical and economic analysis
  - Cost benefit analysis of forecasting investment
  - Geographical differences
  - Differences between measurement hardware and modeling techniques
  - Wind vs. solar - time of day and seasonal

Questions?