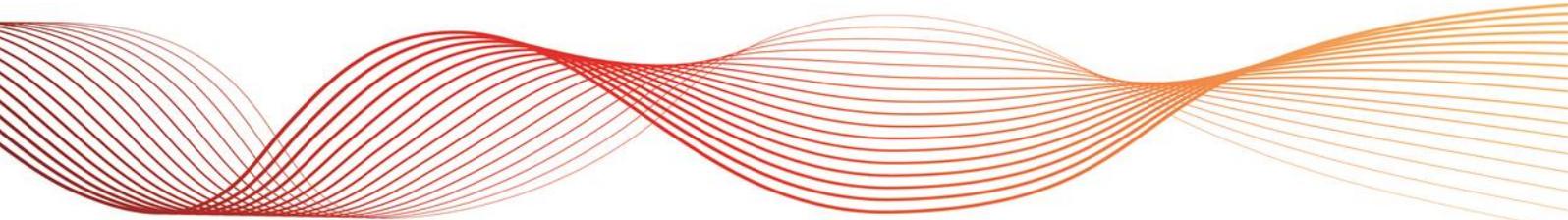




MARKET PARTICIPANT 5-MINUTE SELF FORECAST

BACKGROUND

Published: **February 2018**





IMPORTANT NOTICE

Purpose

AEMO has prepared this document to provide information about the Market Participant 5-Minute Self Forecast, as at the date of publication.

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INTRODUCTION

The Australian Wind Energy Forecasting System (AWEFS) and Australian Solar Energy Forecasting System (ASEFS) provide forecasts for solar and wind energy generation, respectively. The dispatch of semi-scheduled wind and solar farms depend on the output of AWEFS and ASEFS.

The generation forecasts produced by AWEFS and ASEFS use a combination of statistical methods and Numerical Weather Prediction-based models, covering forecasting timeframes from 5 minutes (Dispatch) to 2 years (MT PASA). These models use the following inputs:

- Real time Supervisory Control and Data Acquisition (SCADA) measurements from the power station.
- Numerical Weather Prediction data from multiple weather data providers.
- Standing data from the solar power station as defined in the Energy Conversion Model.
- Additional information provided by the power station, including inverters/ turbines under maintenance and upper MW limit on the facility.

In the dispatch timeframe (5 minute ahead), AWEFS and ASEFS produce Unconstrained Intermittent Generation Forecasts (UIGF), which are used to produce the dispatch targets for semi-scheduled generators. For all semi-scheduled generators, the UIGF forecasts are used in place of the generating unit availability. The National Electricity Market Dispatch Engine (NEMDE) will then dispatch the semi-scheduled generator in a similar manner to a normal scheduled generating unit, based on the bid information provided and the UIGF provided from AWEFS/ASEFS, with the only difference being that a semi-scheduled cap flag will also be provided. This flag may be set on the basis of constraint limitations or bidding reasons. If this cap is set to false then the intermittent generator is not required to follow dispatch targets. If the flag is set to true then the intermittent generator is required to follow the dispatch target only in that its output must not exceed the dispatch target value and will be monitored by the non-compliance monitor.

AWEFS WORKING GROUP AND ESTIMATED POWER

In late 2015, an issue with the accuracy of the AWEFS dispatch forecasts resulted in the identification of a **scheduling error between 2012 and 2016 affecting some operating wind projects**¹. AEMO discussed this issue with a number of affected wind projects. During these discussions further improvements to the process for developing a 'dispatch forecast'² were proposed, including the use of a 'Possible Power' (POSP) SCADA feed provided by Semi-Scheduled Generators in real time.

An **Energy Conversion Model (ECM) guidelines consultation**³ was held between February and December 2016 to address these proposed amendments and improvements. During this consultation, stakeholders expressed a desire for an Estimated Power (ESTP) signal to be implemented in the market to replace AWEFS/ASEFS. A simple definition of ESTP was included as an *optional* signal in the ECM, however, development of detailed requirements and an implementation plan were not within the scope of the consultation. Estimated Power was intended to act as a 5-minute ahead estimate of

¹ AWEFS and ASEFS UIGF scheduling errors (2012 – 2016) report available [here](#).

² A dispatch forecast is the Unconstrained Intermittent Generation Forecast (UIGF) computed by the AWEFS and ASEFS for the dispatch timeframe (5 minutes). These are forecasts of the available capacity of generation, assuming no network constraints apply. For further information see solar and wind energy forecasting on the AEMO website available [here](#).

³ This consultation was conducted under clause 2.2.7(d) of the National Electricity Rules in accordance with the consultation requirements detailed in clause 8.9 of the Rules. The ECM consultation web page is available [here](#).



the available power from each project, subject only to technical factors affecting operation of connection and generation assets. As discussed further below, provision of this variable was optional and did not seem to attract the interest of operating projects unless it was able to affect market outcomes via the central dispatch process. Notwithstanding this, there was a clear preference amongst the stakeholder group for AEMO to work with industry on the development and implementation of the capability for wind and solar projects to produce their own output forecasts.

The **AWEFS and ASEFS working group** was set up following completion of the ECM consultation⁴. Working group meetings were designed as information-sharing sessions with no set formal terms of reference. The 5-minute ahead ESTP signal, including possible implementation details, was discussed in these meetings, however no formal reporting on this has been compiled or made available to date. The AWEFS and ASEFS working group has not been re-convened since late 2016 and the optional Estimated Power variable has not been extensively used by any active NEM participants.

Reasons for the lack of more significant uptake of the Estimated Power variable by operating projects are considered to be:

- R&D development and software development would need to be undertaken by each individual operating project in order for Estimated Power signal to be used to its full potential.
- The signal was not integrated into AEMO systems for use by NEMDE; as such operating projects were not able to affect wholesale market outcomes.
- Implementation and data quality requirements had not been specified.

SELF-FORECASTING: A PROOF-OF-CONCEPT TRIAL

Following the process of trialling the optional estimated power variable in 2017 and in line with the recommendations of the Finkel review, AEMO has partnered with ARENA to reconsider options to improve forecasting systems to deliver better outcomes for consumers and NEM participants.

This **Market Participant Self-Forecasting trial** involves a **collaboration between AEMO, ARENA and industry (forecasting service providers, existing and new wind/ solar projects)** to demonstrate the benefits of wind and solar generator self-forecasting in 2018 and 2019 through a proof-of-concept (POC) demonstration.

This proof-of-concept project will involve:

- **Stage 1:** Engagement with industry to define the design and implementation of the systems to verify and accept participant self-forecasts into AEMO's NEM dispatch engine. An interface will be deployed to support this POC
- **Stage 2:** An ARENA A-lab, to support a set of POC projects implementing reliable self-forecasts into AEMO systems. Encouraging a collective effort to improve forecasts for intermittent generators. The POC will involve a mix of generator sizes and types (i.e. wind/ solar/ hybrid) and forecasting technologies.
- **Stage 3:** Sharing lessons learnt to promote wider industry uptake.

It is intended that this trial have recourse to the ECM consultation and the subsequent working group. The views and ideas from these meetings should be drawn on and expertise from the participants involved is valued and encouraged.

⁴ AWEFS and ASEFS working group web page available [here](#).



AWEFS AND ASEFS WORKING GROUP IN 2018

Following further project planning with ARENA, AEMO expects to re-convene the AWEFS and ASEFS working group before the end of March 2018 to introduce the proof-of-concept trial and seek initial feedback from NEM participants on data quality requirements for self-generated 5-minute ahead forecasts. Information exchanged with the AWEFS and ASEFS working group will be extremely valuable in setting up the criteria for use of self-forecasting outputs in setting actual NEM dispatch targets in the proof-of-concept demonstration.