# AWEFS System Access User Manual for Public Researchers

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## A. What is AWEFS?

AEMO's Australian Wind Energy Forecasting System (**AWEFS**) has been incorporated into AEMO's suite of systems to enable AEMO to meet its obligations under the National Electricity Rules (**Rules**) in relation to forecasting electricity generation.

AEMO's obligations under the Rules include a requirement to establish and maintain processes, mechanisms and systems to balance supply and demand of electricity. AEMO must also provide information to Generators and Market Participants to enable them to make decisions about supply and demand (e.g. clause 3.4 (in relation to the spot market), clause 3.7 (in relation to the PASA), clause 3.8.1 (in relation to the operation of central dispatch), and 3.13 (in relation to the provision of market information)).

To this end, AEMO currently prepares forecasts for wind generation and publishes this information. AWEFS (having commenced operation in November 2008) will improve AEMO's forecasting capability, thereby improving the market's ability to operate more efficiently and AEMO's obligation to meet the national electricity objective, which is defined in section 7 of the National Electricity Law as follows:

> The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

As a part of AEMO's suite of systems, AWEFS will operate under AEMO's established, documented governance arrangements for AEMO's market management systems (**MMS**) in relation to ongoing operational and funding arrangements, and system enhancements.

## B. Who can access AWEFS?

### Data access

#### Objectives

The objective of AWEFS is to make as much information as possible available to public researchers[1] in relation to Australia's wind generation forecasting.

As with all MMS information, commercial and regulatory considerations warrant some data being inaccessible to the public, while in other situations as required by the Rules, data is made public after a time lag (e.g. the next day for bidding data). A list of all data fields in AWEFS, and their availability/confidentiality/Rules obligations, is published on AEMO's website[2]. A summary is provided below in Table 1 and Accessing confidential information

Table **2**.

Parallel objectives of AWEFS are to ensure that sufficient quality information is accessible by AEMO to enable effective forecasting and that access to quality data and system algorithms by public researchers will facilitate further improvement of wind generation forecasting.

#### Accessing non confidential information

Current information available on AEMO's website (and time lags) is detailed in Table 1.

TABLE 1: Information currently published by AEMO containing wind generation values

| Information | Publication | Location |
|---|---|---|
| Daily aggregated dispatch | Published daily, shortly after 0400hrs | http://www.aemo.com.au/data/csv.html |
| Non-scheduled wind generation power data (MW) | Data is confidential on the trading day, and made public on the next trading day | http://www.aemo.com.au/data/csv.html |

[1] A public researcher is a researcher working for a publicly-funded research activity, and may be working in either a government or non-profit organisation, e.g. CSIRO, Bureau of Meteorology, or a University.

[2] http://www.aemo.com.au/registration/researchers.html

Additional wind farm SCADA data (where available) that can be made available is detailed in **Accessing confidential** information

Table **2**. A complete list of wind farm data available to AEMO is noted in section F of this Manual.

## Accessing confidential information

Table 2: Information available from AEMO related to wind generation and forecasting

| Information | Availability |
|---|---|
| Wind speed data | Data is confidential and can be released to public researchers on wind farm approval. |
| Wind turbines availability data | Data is confidential and can be released to public researchers on wind farm approval. |
| Wind direction data | Data is confidential and can be released to public researchers on wind farm approval. |
| Temperature data | Data is confidential and can be released to public researchers on wind farm approval. |
| Control scheme set points | Data is confidential and can be released to public researchers on wind farm approval. |
| Pressure or humidity data | Data is confidential and can be released to public researchers on wind farm approval. |

NOTE: Some Numerical Weather Prediction (NWP) data is not subject to the Sub-licence[3], and is considered public data as it is freely available from the provider's website. This kind of NWP data will not be made available on the AEMO website due to the volume of the data involved. A licence for the European Centre for Medium Range Weather Forecasts (ECMWF) NWP data procured for AWEFS is accessible via the Sublicence, if required by a researcher.

AWEFS-specific arrangements have been established for access to this confidential information

The AWEFS system currently used by AEMO to forecast wind energy input to the NEM is used under licence from ANEMOS.

AEMO is not permitted to allow third parties access to the system unless it is under a Sublicence between AEMO and a public researcher.

[3] For example, Global Forecast System (GFS) from the USA: GFS data is publicly available from the US National Weather Service website as per the disclaimer on http://www.weather.gov/disclaimer.php

In addition, the wind farm data that is relevant to a public researcher falls under the same category as the ANEMOS system, insofar as AEMO does not have authority to disseminate the data to a third party.

Thus, access to wind farm data can be gained through the Sub-licence, which incorporates a Wind Farm Data Confidentiality Deed Poll.

AWEFS System Access and Licence Agreement (**Sub-licence**) and Wind Farm Data Confidentiality Deed Poll are available from the AEMO website[4].

[4] http://www.aemo.com.au/registration/researchers.html

## C. Process for gaining access

### Access via AWEFS Sub-licence

AEMO will grant a sub-licence to public research bodies to access the PC Model[5] (including its source code) and access the AWEFS platform[6] (excluding source code) for the purposes of public Australian research needs. The PC model incorporates the standard calls to the underlying data stores in AWEFS, and is used to initiate the development of new algorithms.

NOTE: The PC Model would be provided to users after signing the Sublicence.

A 'train the trainer' mechanism was used to provide initial training to public researchers in the use of the PC Model. This training was held in April 2009 in AEMO's Sydney offices. As part of access to the AWEFS system, public researchers will receive documentation that includes software manuals and the presentations given by ANEMOS trainers.

### AWEFS data availability and confidentiality

A list of all data in AWEFS and their availability and a sample Sub-licence and Wind Farm Data Confidentiality Deed Poll are available from the AEMO website[7]. Please note that the terms of the Sub-licence are non-negotiable.

### Access to specific information/reports

Access to confidential data is available to public researchers via the AWEFS access control system.

Permission to access confidential data must be granted by the wind farm whose data is being sought.

If the wind farm agrees to make the requested data available the Wind Farm Data Confidentiality Deed Poll (which is a schedule to the Sub-licence) will apply, and the wind farm will authorise access to the agreed data by granting access through the AWEFS access control system.

A flowchart of this process is documented in Section E of this Manual.

### Access to expertise

AEMO maintains operational and development expertise in forecasting. Depending on the purpose of any request, AEMO may make available a limited amount of this expertise to researchers without charge.

- Anemos Subject Matter Experts for PC Model relevant queries, for a fee, subject to a Researcher support agreement being agreed with Anemos

[5] PC Model: a standard forecasting template for a wind power prediction module compatible to the AWEFS platform (aka ANEMOS platform)
[6] Public researchers require access to AWEFS platform to retrieve confidential wind farm data
[7] http://www.aemo.com.au/registration/researchers.html

Industry expertise is available through a number of industry groups including:

- Dispatch and Pricing Reference Group (DPRG), chaired by AEMO[8]
- Network Generators Forum (NGF)[9]
- Energy Supply Association of Australia (ESAA)[10]
- AEMO also hosts a Microsoft SharePoint web facility with an AWEFS website, that includes a discussion forum for communication between ANEMOS members and researchers (http://share.aemo.com.au/awefs/default.aspx)[11]

It is expected that relationships will grow between public researchers (both local and international), and between public researchers and organisations such as AEMO. AEMO will not directly fund research unless it is directly related to solving an operational issue, however, it is expected that research in the forecasting arena will grow.

## Special requests and services

Public researchers may request access to reports or data not provided under the existing AWEFS system. Subject to confidentiality requirements and availability of resources, AEMO will make the requested reports or data available on a cost-recovery basis.

**Reference documents:**

- National Electricity Rules (e.g. information sharing; security requirements)[12]
- AWEFS System Access and Licence Agreement
- AEMO's Market Systems – Getting started – gaining and maintaining access guide[13]
- Policy 020113 Market Management systems access policy and procedure
- AWEFS data list – availability and confidentiality[14]

[8] http://www.aemo.com.au/corporate/dprg.html
[9] http://www.ngf.com.au/html/
[10] http://www.esaa.com.au
[11] Contact Helpdesk for account creation to the SharePoint website
[12] http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html
[13] http://www.aemo.com.au/registration/nemnet.html
[14] http://www.aemo.com.au/registration/researchers.html

## D. AEMO's IT Change Management Procedure

AEMO's IT change management procedures (encompassing MMS of which AWEFS is part), are maintained and published on AEMO's website[15]. The procedures describe how proposed changes to systems should be progressed, the information required by the Change Management Working Group in considering proposed changes, and the role of AEMO to work with public researchers in developing and prioritising changes to AWEFS.

AEMO's IT Change Management Procedures Manual outlines the management, evaluation and consultation on changes to AEMO's IT, whilst providing a transparent, accessible and simplified process for proponents of change.

There are four major steps within AEMO's Change Management Process[16]:

**Change initiation:** the change management process is triggered by the identification of a need to improve the current environment. Anyone may propose a change and submit it to AEMO's Help Desk.

**Change assessment:** AEMO will assess the business and technical issues associated with the proposed change.

**Change authorisation** AEMO will authorise (including allocation of authorised changes to a particular release) all changes considering costs, benefits and risks to the operation of the market in their evaluation of the process.

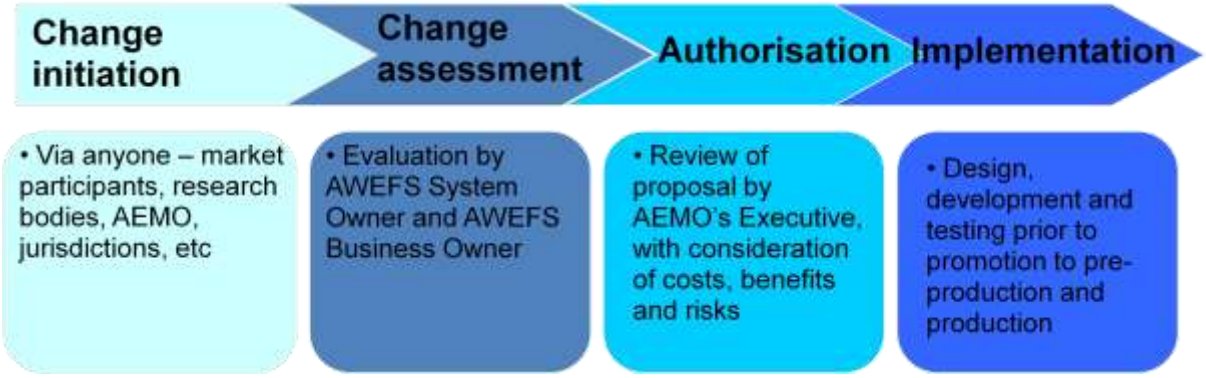
**Change implementation:** enhancements to AWEFS will progress through a design, development and testing phase prior to promotion of the change to the pre-production and production environment. A release schedule will be developed to ensure the change meets all of the change management criteria and that there are no scheduling conflicts. All interested parties are notified of the release schedule and provided with an opportunity to requests delays, amendments, etc prior to implementation.

As part of the addition of models it will be important to have two data sets to use. One data set will be used to train the model and the second to show its performance. The data sets will need to be sufficient to truly represent the time frame of the model, for example, it is likely that 12 months of data will be required for typical 8 day forecasting.

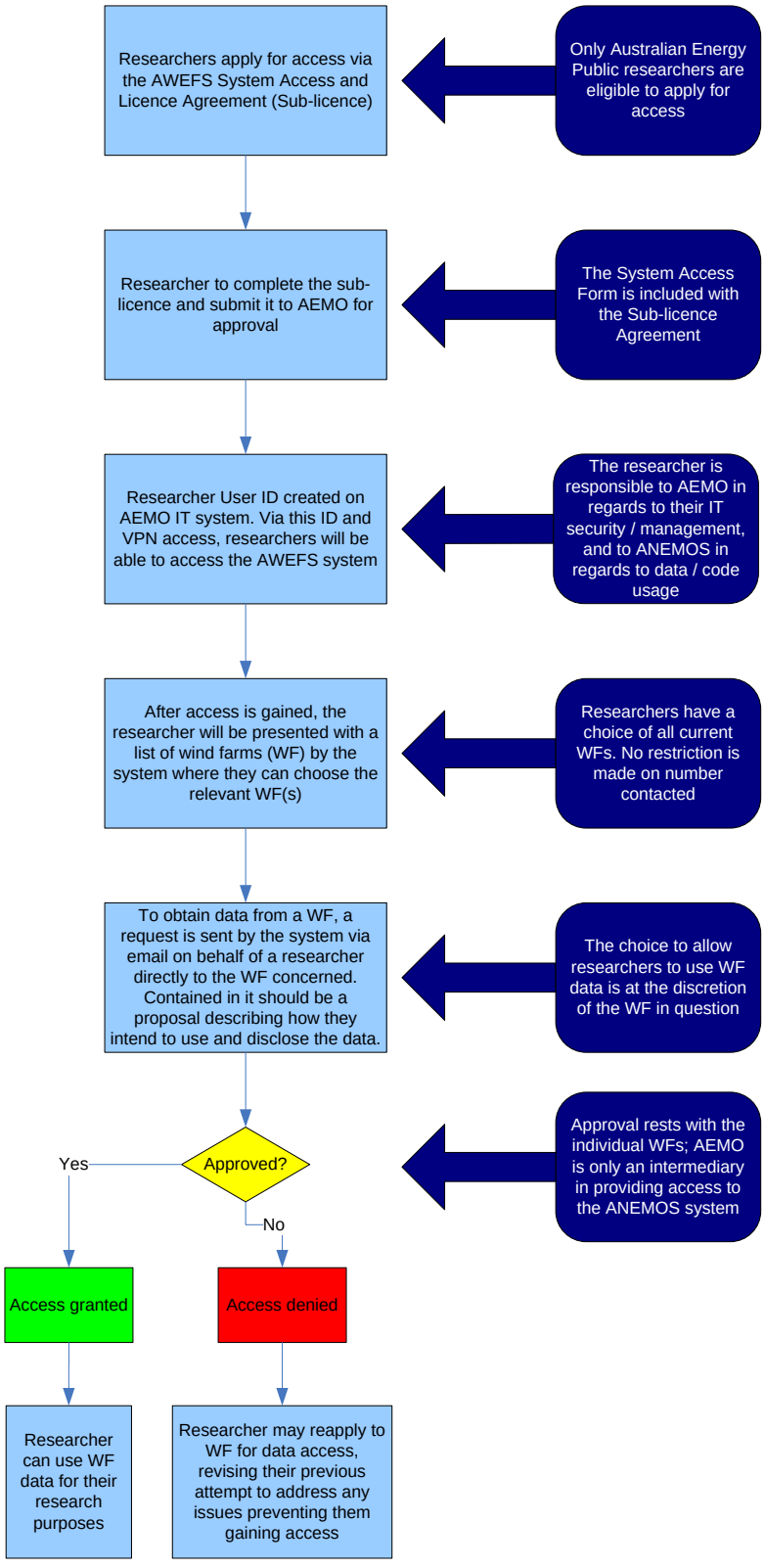
[15] Refer to http://aemo.com.au/registration/change.html

[16] The overview of AEMO's four step Change Management Process is an extract form the IT Change Management Procedures Manual, version 6.4, published on AEMO's website, http://aemo.com.au/registration/change.html

Figure 1: Overview of AEMO's change management process



## E. Instructions on how to access the system



## F. AWEFS data list

A comprehensive list of wind farm data is available from the AEMO website[17]. Please note that all data items are not available for all wind farms in the NEM.

[17] http://www.aemo.com.au/registration/researchers.html

## G. Ongoing support

### 1. Logging requests for assistance

1. **Access to the AEMO Helpdesk via phone**
   - For checking the status of NEMNet and IT systems at any time, call 1300 300 295 and choose option 1.
   - To speak with a Helpdesk representative, call 1300 300 295 and choose option 2.
   - For non-urgent issues, normal coverage is 8am to 6pm on weekdays, Sydney time. For urgent issues, this number operates 24/7.

2. **Access to the AEMO Helpdesk**
   Please note that AEMO recommends researchers call the AEMO Helpdesk for all issues on 1300 300 295.

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