AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Guide to Data Requirements for AWEFS and ASEFS

September 2022

Supplementary material to the Solar and Wind Energy Conversion Models

Important notice

PURPOSE

AEMO has prepared this document to provide information about the *Energy Conversion Model* data requirements for the Australian Wind Energy Forecasting System (AWEFS) and the Australian Solar Energy Forecasting System (ASEFS), as at the date of publication.

DISCLAIMER

This document or the information in it may be subsequently updated or amended. This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law, the National Electricity Rules, or any other applicable laws, procedures or policies. AEMO has made every effort to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it.

VERSION CONTROL

Version	Release date	Changes
1.0	31/10/2018	Initial release
2.0	21/12/2018	Updated measurement point for Wind Direction SCADA signal following publishment of the updated ECM Guidelines
3.0	15/04/2021	Removed the requirement for participants to submit intermittent generation availability information in the Pre-Production Markets Portal. Added further clarifications throughout document and FAQ section.
4.0	08/12/2021	Updated 'Elements Unavailable' to 'Elements Available' for submitting new plant availability and included API as a new method for submitting plant availability. Added further clarifications throughout document and FAQ section.
5.0	19/09/2022	Updated the document to reflect the National Electricity Amendment (Integrating Energy Storage Systems into the NEM) Rule 2021.

Executive summary

This document details the intermittent generation (including wind and solar) data that AEMO requires to prepare the Australian Wind Energy Forecasting System (AWEFS) and the Australian Solar Energy Forecasting System (ASEFS) for new or existing wind and solar farms, respectively.

It supplements AEMO's *Energy Conversion Model* (ECM) Guidelines, which can be found on the AEMO website[1].

Under National Electricity Rules (NER) rule 3.7B(a)[2], AEMO is required to prepare forecasts of the available capacity of semi-scheduled generators to schedule sufficient generation in the Dispatch process. AEMO is also required to prepare an *Unconstrained Intermittent Generation Forecast* (UIGF)[3] to be used in PASA processes for reserve assessment purposes.

To meet these requirements:

- AWEFS produces wind generation forecasts for all semi-scheduled and non-scheduled wind farms for several market system processes (Dispatch, 5min Pre-dispatch (5MPD), Pre-dispatch (PD), and Short term (ST) PASA).
- ASEFS produces solar generation forecasts for all semi-scheduled and significant non-scheduled solar farms for several market system processes (Dispatch, 5MPD, PD, and STPASA).

[1] Found at https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/operational-forecasting/solar-and-wind-energy-forecasting.

[2] Refer to Appendix A1, Rules relating to AWEFS/ ASEFS modelling requirements.

[3] *Unconstrained Intermittent Generation Forecast* (UIGF) is the forecast generation output of individual semi-scheduled generating units (wind/ solar farms) without considering network limitations modelled in AEMO constraints, economical decisions or the dispatch optimisation process.

Contents

Tables

1. Data supply requirements

1.1 Intermittent generator and cluster standing data

All semi-scheduled generating units (see National Electricity Rules (NER) clause 2.2.7(c)(2) and 2.2.7(c1)(3)(ii)) and some intermittent non-scheduled generating units (NER clause 2.2.3(c)), connecting to the National Electricity Market (NEM) are required to submit[4] to AEMO an ECM consisting of the intermittent generator details and attributes. The static data and dynamic measurements provided as part of the ECM assist AEMO in developing forecasting models for intermittent generators.

ECM validation is a mandatory step for all intermittent semi-scheduled generating units (and some non-scheduled generating units) before Registration in the NEM is approved by AEMO.

The following guidelines may assist in ensuring a satisfactory and timely validation of the ECM:

1. All data items identified as 'mandatory' need to be completed/provided. Incomplete data will result in delays with validation and approval.
2. The 'Cluster Definition Guideline'[5] needs to be considered while grouping clusters.
3. The ECM should contain a separate 'ECM Cluster' tab for each cluster.

ECM validation is a time-consuming process, taking four to six weeks from the time of submission to AEMO. To avoid delays, AEMO recommends that the first draft of the ECM be submitted to AEMO at least three months before applying for Registration.

1.2 Wind farm SCADA to AEMO

Table 1 and Table 2 below list the remote monitoring (SCADA) parameters required for modelling wind farms in AWEFS. Table 1 outlines the farm level data requirements, while Table 2 outlines the cluster level requirements. Note that if the wind farm being modelled in AWEFS consists of only one cluster, then the information requested in Table 2 is redundant.

All SCADA data described in the following tables are expected to be instantaneous measures, unless otherwise agreed by AEMO. Instantaneous means the values are updated every 4 to 10 seconds, with 4 seconds or faster preferred. If only averages are available, a maximum 15 second update is required.

[4] Energy Conversion Models can be submitted for validation via op.forecasting@aemo.com.au.

[5] 'Cluster Definition Guidelines' are provided in the solar ECM (introduction tab) and wind ECM (cluster definition guideline tab).

Table 1 SCADA parameters for modelling wind farms in AWEFS: Farm level

Signal	Unit	Measured from	Mandatory	Preferred deadband*	Decimal places
Wind Farm Active Power	MW	Dispatch Point**	Yes	0.01 MW	>=2
Control System Set-Point	MW	Dispatch Point**	Yes	0.01 MW	>=2
Local Limit	MW	Dispatch Point**	Yes	0.01 MW	>=2
Possible Power	MW	Dispatch Point**	Optional	0.01 MW	>=2
Number of Wind Turbines Available for Generation	No.	Wind farm control system	Yes	1	0
Number of Wind Turbines Operating/ Actively Generating	No.	Wind farm control system	Yes	1	0
Wind Turbines Extreme Wind Cut-Out	No.	Wind farm control system	No	1	0
Wind Speed	m/s	Average of anemometers of all Turbine Nacelles	Yes	0.1 m/s	>=1
Wind Direction	° (degrees)	Average of anemometers of all Turbine Nacelles – average requires proper directional averaging (x-y decomposition)	Yes	1°	>=0
Ambient Temperature	°C	Weather sensor or met-mast.	Yes	0.1°C	>=1
Barometric Pressure	hPa	Weather sensor or met-mast.	No	1 hPa	>=0

* Minimum required deadband settings can be found in Table 3 of http://aemo.com.au/-/media/Files/Electricity/NEM/Network_Connections/Transmission-and-Distribution/AEMO-Standard-for-Power-System-Data-Communications.pdf.

** These signals must be referenced to the agreed dispatch point. All signals with '**' must be referenced to the same location.

Table 2 SCADA parameters for modelling wind farms in AWEFS: cluster level*

Signal	Unit	Measured from	Mandatory	Preferred deadband	Decimal places
Cluster Active Power	MW	Wind farm control system	Yes	0.01 MW	>=2
Cluster Number of Wind Turbines Available for Generation	No.	Wind farm control system	Yes	1	0
Cluster Number of Wind Turbines Operating/ Actively Generating	No.	Wind farm control system	Yes	1	0

Signal	Unit	Measured from	Mandatory	Preferred deadband	Decimal places
Cluster Wind Turbines Extreme Wind Cut-Out	No.	Wind farm control system	No	1	0
Cluster Wind Speed	m/s	Average of anemometers of all Turbine Nacelles in this cluster	Yes	0.1 m/s	>=1
Cluster Wind Direction	° (degrees)	Average of anemometers of all Turbine Nacelles – average requires proper directional averaging (x-y decomposition)**	Yes	1°	>=0

*Note that if the wind farm being modelled in AWEFS consists of only one cluster, then cluster-level signals are not required.
** Example: https://en.wikipedia.org/wiki/Mean_of_circular_quantities.

1.3 Solar farm SCADA to AEMO

Table 3 and Table 4 below list the SCADA parameters required for modelling solar farms in ASEFS. Table 3 outlines the farm level data requirements, while Table 4 outlines the cluster level requirements. The cluster level requirements, in Table 4, should be provided for each cluster that comprises the solar farm.

All SCADA data described in the following tables are expected to be instantaneous measures, unless otherwise agreed by AEMO. Instantaneous means the values are updated every 4 to 10 seconds, with 4 seconds or faster preferred. If only averages are available, a maximum 15 second update is required.

A minimum of one weather station is required to be installed per solar farm. In addition, a minimum of one pyranometer is required to be installed per cluster. For solar farms that have on average more than one pyranometer per cluster, the cluster irradiance SCADA signals should be calculated as an average of the pyranometer readings, ensuring that bad quality readings are excluded from the average calculation.

Table 3 SCADA parameters for modelling solar farms in ASEFS: Farm level

Signal	Unit	Measured from	Mandatory	Preferred deadband	Decimal places
Solar Farm Active Power	MW	Dispatch point*	Yes	0.01 MW	>=2
Control System Set-Point	MW	Dispatch point*	Yes	0.01 MW	>=2
Local Limit	MW	Dispatch point*	Yes	0.01 MW	>=2
Possible Power	MW	Dispatch point*	No	0.01 MW	>=2
Wind Speed	m/s	Weather station or met-mast. To be representative of whole farm.	Yes	0.1 m/s	>=1
Wind Direction	° (degrees)	Weather station or met-mast. To be representative of whole farm.	Yes	1°	>=0
Ambient Temperature	°C	Weather sensor or met-mast. To be	Yes	0.1°C	>=1

Signal	Unit	Measured from	Mandatory	Preferred deadband	Decimal places
		representative of whole farm.			
Relative humidity	%	Weather sensor or met-mast. To be representative of whole farm.	Yes	0.1%	>=1

These signals must be referenced to the agreed dispatch point. All signals with '' must be referenced to the same location.

Table 4 SCADA parameters for modelling solar farms in ASEFS: cluster level

Signal	Unit	Measured from	Mandatory	Preferred deadband	Decimal places
Global horizontal irradiance	W/m^2	ISO first class pyranometer. Should be average of all pyranometer readings in cluster.	Yes	1	>=0
Global inclined irradiance	W/m^2	ISO first class pyranometer. Should be average of all pyranometer readings in cluster.	Yes	1	>=0
Direct normal irradiance	W/m^2	ISO first class pyranometer. Should be average of all pyranometer readings in cluster.	Yes (CPV & CST only)	1	>=0
Module surface temperature	°C	Module temperature sensor. Should be an average of all modules in cluster.	Yes (PV & CPV only)	0.1°C	>=1
Module receiver surface temperature	°C	Module temperature sensor. Should be an average of all receivers in cluster	Yes (CST only)	0.1°C	>=1
Number of inverters available	No.	Solar farm control system	Yes	1	0
Reduction through soiling	%	Solar farm control system	Yes (CST only)	1	>=0
Actual tracking slope angle	° (degrees)	Solar farm control/tracking system	Yes (Solar farms with slope tracking technology)	0.1°	>=1
Actual tracking azimuth angle	° (degrees)	Solar farm control/tracking system	Yes (Solar farms with azimuth tracking technology)	0.1°	>=1
Tracking share of modules/ concentrators not on track	%	Solar farm control/tracking system	Yes (Solar farms with tracking technology)	0.1%	>=1
Trackers online	No.	Solar farm control/tracking system	No (Solar farms with tracking technology)	1	0

2. Cluster definition

A cluster is a group of intermittent generating units; there may be more than one cluster in an intermittent generator. When defining the number of clusters in an intermittent generating unit, the following guidelines should be noted.

Table 5 Cluster definition guidelines

Technology	Definition
Wind	To define a "cluster" the ensemble of the following constraints should be satisfied: • No more than 7 km x 7 km (with some degree of flexibility). • Only identical turbines are included in a cluster (turbines supplied by same manufacturer, having the same model, hub height and characteristic power curve). The factors that are expected to affect the definition of such clusters are: • Important changes in the terrain complexity throughout the area covered by the wind farm. • Changes in the meteorology due to the size of the area covered (presence of local patterns). • Physical separation of parts of the wind farm (considerable distance between groups of wind turbines). • Different timing in the development/commissioning of parts of the wind farm. • Different types of wind turbines in the wind farm (model, hub height). • More than one connection point to the grid.
Solar PV technology	A cluster is defined as a subset of the Facility with: • The same inverter type (manufacturer, model and rating). • The same module material (PolySi or CdTd or ...). • The same total module DC power connected to each inverter. Tolerance: +/- 2.5% from average. • The same fixed slope and azimuth angles of modules, if fixed. • The same tracking algorithm and ranges, if tracking. • Geographically close location of all modules (within an area up to 5km x 5km)
Solar CPV technology	A cluster is defined as a subset of the Facility with: • The same module type (manufacturer, model and material). • The same inverter type (manufacturer, model and rating). • The same number of modules connected to each inverter. • The same tracking algorithm and ranges. • The same concentrator attributes. • Geographically close location of all modules.
Solar CST technology	A cluster is defined as a subset of the facility with: • The same actual turbine(s). • The same tracking algorithm and ranges. • The same concentrator attributes. • Geographically close location of all modules.

3. Submitting plant availability via the Electricity Market Management System (EMMS) Portal and API

The EMMS Portal ('Markets Portal') and API is used by intermittent generators to submit changes to their future plant availability (Upper MW Limit and Elements Available) for PD/STPASA and MTPASA purposes, according to rule 3.7B(b).

Availability profiles can be updated as frequently as the change occurs, but not retrospectively for historical 30min intervals. Participants are required to update their generator's availability profiles only in the Production Markets Portal or via API.

For information on accessing, using and submitting plant availability information via the Markets Portal, please see the Guide to Intermittent Generation document available on the AEMO website[6] or via the help menu in the EMMS portal[7]. Information on submitting plant availability via API can be found in the Intermittent Generation Availability API documentation[8]. Additional information and examples of when participants are required to submit plant availability information can be found in the NEM Operational Forecasting and Dispatch Handbook for wind and solar generators[9].

To facilitate intermittent generation forecast accuracy, the availability interface allows participants' operational staff to input the following information for intermittent generating units on a half-hourly resolution (for PD and STPASA timeframes) and a daily resolution (for MTPASA). Submissions of Upper MW Limit and Elements Available does not affect forecasts in the Dispatch and 5MPD timeframes. Instead, the SCADA Local Limit, SCADA Control System Set-Point, and SCADA Turbines/Inverters Available should be used in these timeframes.

Upper MW Limit

The Upper MW Limit submission relates to the whole facility.

This input indicates when a facility is down regulated, as a MW limit is applied in the intermittent generator's control system, to limit its MW output to below maximum capacity. This MW limit is a result of planned and unplanned maintenance and should not include any transmission network or distribution network limitations that are managed by AEMO through the central dispatch process (for example, via constraints) per NER 3.7B(c)(6). Participants must liaise with the NSP to determine whether these limits have been communicated

[6] Available at https://www.aemo.com.au/-/media/files/market-it-systems/guide-to-intermittent-generation.pdf .

[7] Available at https://portal.prod.nemnet.net.au (production) and https://portal.preprod.nemnet.net.au (pre-production).

[8] Available at https://dev.aemo.com.au/

[9] Available at https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/nem-operational-forecasting-and-dispatch-handbook-for-wind-and-solar-generators.pdf

to and managed by AEMO through the central dispatch process to ensure appropriate action is taken thereafter.

The default value of -1 indicates that there is no availability limit in place i.e. at the maximum capacity of the generating unit.

Elements Available

The Elements Available value is required on a per cluster basis.

This input indicates the number of elements (turbines or inverters) within each cluster which are connected and available for generation. Examples of elements being unavailable could be due, but not limited, to maintenance, turbines not being built, or the inability to generate because transmission or distribution networks are unavailable.

4. FAQs

Q1 What value should I provide for an ECM SCADA signal to AEMO?

You should provide a range of possible values that fall within the valid range of the parameter, satisfying the deadband requirements specified in tables 1-4. If the value falls outside the valid range, or if the value is stuck for an extended period of time, it has the potential to impact dispatch forecast accuracy and result in large differences between the generator's dispatch target and output potentially resulting in greater financial impacts to participants and may be deemed non-compliant.

Q2 My intermittent facility contains two dispatchable units. How many ECMs do I have to submit?

You should submit one ECM for each dispatchable unit in the facility being registered. For example, if a generating facility contains one wind farm and one solar farm, you must submit two ECMs in total. If a solar farm is being built in two stages but will be dispatched as one unit using the same power plant controller (PPC), then only one ECM is required to be submitted.

Q3 How many clusters should my farm have?

Refer to the 'Cluster Definition Guideline' tab in the ECM.

Q4 Is the ECM the same as the SCADA signals list sent to AEMO?

The ECM and SCADA signals list are separate items that must be submitted as part of the registration process for semi-scheduled intermittent generators. The ECM defines the SCADA signals required for intermittent generators to be used in AEMO's forecasting systems thus, the SCADA signals list cannot be reviewed and approved until the ECM has been approved by AEMO. The SCADA signals defined in the ECM should be included in an applicant's SCADA signals list following AEMO approving the ECM.

Q5 How long does it take for AEMO to develop the AWEFS/ASEFS forecasting model?

AEMO requires up to three weeks to implement an AWEFS or ASEFS forecasting model. This three-week process is scheduled in the monthly forecasting model updates batch following all critical ECM SCADA signals becoming 'good' quality, are working as expected, and the availability information in the Markets Portal is reflective of site conditions and plant availability. More information on these requirements can be found in the NEM Operational Forecasting and Dispatch Handbook for wind and solar generators[10]. The AWEFS/ASEFS forecasting model is periodically updated to improve dispatch, 5MPD and PD/STPASA forecast outcomes.

Q6 How can I submit my farm's plant availability?

Plant availability can be submitted via the Production Markets Portal or via API. Plant availability submitted via the Pre-Production Markets Portal has no effect on real-time Production systems nor the PD/STPASA forecasts generated in the Pre-Production Markets Portal, as plant availability submitted in the Production Markets Portal or via API is used to produce these forecasts.

[10] Available at https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/nem-operational-forecasting-and-dispatch-handbook-for-wind-and-solar-generators.pdf.

Q7 When should I begin to update my farm's plant availability in the EMMS Portal or via API?

You should update the PD/STPASA Availability and MTPASA Availability in the Intermittent Generation section in the EMMS Production environment or via API following IT access provision. Participants will be granted access to the EMMS Pre-Production environment some weeks or months prior to registration, to allow them to test their IT systems and interaction with AEMO's systems.

Participants applying to register a new generator under an existing Participant ID will already have access to the EMMS Production environment. Participants applying to register a new generator under a new Participant ID will be granted access to the EMMS Production environment on the registration effective date.

Q8 How often should I update or submit my farm's plant availability in the EMMS portal or via API?

The MW Upper Limit and Elements Available should reflect what is currently occurring at the farm, as seen in the farm's SCADA values, or what is planned to occur at the farm in the future (such as planned maintenance). The most recent submission for a trading date is brought forward each trading day until another submission is made. Therefore, submissions are not required to be repeated each day and are only required when there has been a change in the farm's plant availability. For this reason, it is important to submit changes both before and after any events affecting plant availability.

Q9 Why is the generator's dispatch forecast too low or high compared with its output?

This could be due to a range of factors such as:

- Bad/suspect quality SCADA values e.g. values falling outside valid range.
- Stuck 'good' quality SCADA values e.g. wind speed SCADA signal stuck at 7m/s for a few hours.
- Weather SCADA signals not reflecting actual site conditions e.g. inclined irradiance SCADA signal reflecting horizontal irradiance instead of the module inclined irradiance.
- Availability SCADA signals not reflecting actual availability e.g. Inverters Available SCADA signal showing more inverters available than the actual inverter availability, or the Local Limit SCADA signal not reflecting reductions in available capacity due to a transformer being out of service.

5. Further information

Further information on the ECM, AWEFS/ASEFS, and participant self-forecasting can be found on the AEMO website or via the following links:

1. Application forms and supporting documentation for new generators: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/participate-in-the-market/registration/register-as-a-generator-in-the-nem
2. NEM Operational Forecasting and dispatch handbook for wind and solar generators: https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/nem-operational-forecasting-and-dispatch-handbook-for-wind-and-solar-generators.pdf
3. Guide to Intermittent Generation: https://www.aemo.com.au/-/media/files/market-it-systems/guide-to-intermittent-generation.pdf
4. Solar and wind energy forecasting: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Solar-and-wind-energy-forecasting
5. Participant Self-forecasting: https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/operational-forecasting/solar-and-wind-energy-forecasting/participant-forecasting
6. 2016 Consultation for amendments to the Energy Conversion Model: https://aemo.com.au/en/consultations/current-and-closed-consultations/energy-conversion-model-guidelines-consultation-wind-and-solar-farms
7. 2018 Abridged consultation on amendments to the Energy Conversion Model Guidelines: https://aemo.com.au/en/consultations/current-and-closed-consultations/2018-abridged-consultation-on-amendments-to-the-energy-conversion-model-guidelines
8. AWEFS and ASEFS working group: https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/intermittent-generator-forum
9. How semi-scheduled generators operate in dispatch: https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3705-dispatch.pdf

A1. Rules relating to AWEFS/ASEFS modelling requirements

This table details various rule requirements relevant to wind and solar farm proponents, to enable AEMO to model an intermittent generator in AWEFS or ASEFS.

Table 6 Rules related to modelling intermittent generators in AWEFS/ASEFS

Rule clause	Requirement
2.2.7 (c)	AEMO must approve a request for classification as a semi-scheduled generating unit if it is satisfied that the output of the generating unit is intermittent and that the person: (1) Has submitted data in accordance with schedule 3.1; (2) has submitted an energy conversion model which contains the information described in the guidelines referred to in paragraph (d); (3) has adequate communications and telemetry to support the issuing of dispatch instructions and the audit of responses.
2.2.7 (c1)	AEMO may, on an application being made for the purposes of paragraph (b), approve on such terms and conditions as AEMO considers appropriate, classification of a bidirectional unit that is a coupled production unit as a semi-scheduled generating unit if AEMO is satisfied that: (1) the output of some or all generating plant comprised in the bidirectional unit is intermittent; (2) except for auxiliary load, the bidirectional unit will not consume electricity delivered from the national grid at the connection point for the bidirectional unit; and (3) the person: (i) has submitted data in accordance with schedule 3.1 and paragraph (c3); (ii) has submitted an energy conversion model; and (iii) has adequate communications and telemetry to support the issuing of dispatch instructions and the audit of responses.
2.2.7 (c2)	A person must comply with any terms and conditions imposed by AEMO as part of an approval under paragraph (c1).
2.2.7 (c3)	When a person submits data under schedule 3.1 for a coupled production unit that it wishes to classify as a semi-scheduled generating unit under paragraph (c1), the maximum generation must be limited to the maximum generation of that part of the coupled production unit that is intermittent.
2.2.3(c)	If, in relation to an application under paragraph (b), in AEMO's opinion it is necessary for any reason (including *power system security*) for the relevant *Generator or Integrated Resource Provider* to comply with some of the obligations of a *Scheduled Generator* or *Semi-Scheduled Generator* for that *generating unit or Scheduled Integrated Resource Provider for that bidirectional unit*, *AEMO* may approve the classification on such terms and conditions as *AEMO* considers reasonably necessary.

Rule clause	Requirement
3.7B (a)	AEMO must prepare a forecast of the available capacity of each semi-scheduled generating unit (to be known as an unconstrained intermittent generation forecast) in accordance with this rule 3.7B for the purposes of: (1) the projected assessment of system adequacy process; (2) dispatch; and (3) pre-dispatch.
3.7B (b)	A *Semi-Scheduled Generator* must: (1) submit to *AEMO*, in accordance with the *timetable*, the *plant availability* for each *semi-scheduled generating unit* for the purpose of paragraph (a) as soon as the *Semi-Scheduled Generator* becomes aware that the *plant availability* of the unit is at least 6MW below or above the *nameplate rating* of the unit; and (2) where the *Semi-Scheduled Generator* has submitted *plant availability* in accordance with subparagraph (1), notify *AEMO* in accordance with the *timetable* as soon as the *Semi-Scheduled Generator* becomes aware of any changes to the *plant availability* of that *semi-scheduled generating unit* until such time as the *plant availability* of that *semi-scheduled generating unit* is no longer at least 6MW below or above the *nameplate rating* of the unit.
S5.2.6.1(b)	The remote monitoring quantities referred to under paragraph (a) that AEMO may request include: ... (2) in respect of: *i.* a generating unit with a nameplate rating of 30 MW or more; *ii.* *a bidirectional unit with a nameplate rating of 5 MW or more,* current, voltage, active power and reactive power in respect of generating unit or bidirectional unit stators or power conversion systems (as applicable); ... (5) in respect of a semi-scheduled generating system, or a semi-scheduled generating unit in an integrated resource system, all data specified as mandatory in the relevant energy conversion model applicable to that type of semi-scheduled generating system;
S5.2.6.1(d)	The quantities referred to under paragraph (c) that AEMO may request include: (1) the active power level of the generating unit or generating system (as applicable); ... (3) if a semi-scheduled generating system or a semi-scheduled generating unit in an integrated resource system, all data specified as mandatory in the relevant energy conversion model applicable to that type of semi-scheduled generating system or semi-scheduled generating unit.

Glossary

This document uses many terms that have meanings defined in the National Electricity Rules (NER). The NER meanings are adopted unless otherwise specified.

Term	Definition
5MPD	5-minute Pre-dispatch
API	Application Programming Interface
ASEFS	Australian Solar Energy Forecasting System
AWEFS	Australian Wind Energy Forecasting System
DUID	Dispatchable Unit identifier
ECM	Energy Conversion Model
EMMS	Electricity Market Management System
IRP	Integrated Resource Provider
PD	Pre-dispatch
MTPASA	Medium Term Project Assessment of System Adequacy
SCADA	Supervisory Control and Data Acquisition
STPASA	Short Term Project Assessment of System Adequacy
UIGF	Unconstrained Intermittent Generation Forecast