



Energy adequacy assessment projection (EAAP) guidelines

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Version: 1.8

Effective date: 24 April 2023

Status: FINAL

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Date: 24 April 2023

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Current version release details

Version	Effective date	Summary of changes
1.8	24 April 2023	Updates reflecting the Reliability Forecasting Guideline and methodology Consultation, including changes which are effective from 3 June 2024 under the National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13

Note: There is a full version history at the end of this document.

1. Introduction

1.1. Purpose and scope

These are the *EAAP Guidelines* made under clause 3.7C(k) of the National Electricity Rules (NER) (**Procedures**).

These Procedures have effect only for the purposes set out in the NER. The NER and the National Electricity Law prevail over these Procedures to the extent of any inconsistency.

Terms defined in the National Electricity Law, the NER and the National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13 (IESS Rule)¹ have the same meanings in these Procedures unless otherwise specified in this clause. Defined terms/Terms defined in the NER and the IESS Rule are intended to be identified in these Procedures by italicising them, but failure to italicise a defined term does not affect its meaning.

These Procedures are subject to the principles of interpretation set out in Schedule 2 of the National Electricity Law.

2. Preparation of the EAAP

AEMO is required by Rule 3.7C(d) to *publish* an *EAAP*:

1. at least once in every 12 month period in accordance with the *timetable*; and
2. as soon as practicable after becoming aware of any new information that may materially alter the most recently published *EAAP*.

The *EAAP* will be prepared and *published* in accordance with Rule 3.7C using methodologies and inputs consistent with AEMO's Electricity Statement of Opportunities (**ESOO**) and other inputs derived through the Generator Energy Limitations Framework (**GELF**). Consistent with the ESOO, the *EAAP* will use probabilistic modelling to determine the *regional Unserved Energy (USE)* at an hourly resolution during the *Study Period*. This involves the use of time-sequential, security constrained optimal dispatch simulations, incorporating Monte-Carlo Simulations.

AEMO will use the modelling assumptions listed in section 3.2 of this document in preparing the *EAAP*. At least once in every 12 month period, or when notified by AEMO that an additional *EAAP* is required, the *GELF parameters* will be submitted by *Scheduled production units*, consistent with the selected form of *GELF* as explained in section 3 of this document.

3. EAAP Guidelines

These EAAP guidelines cover the following areas, as required by Rule 3.7C(k):

- scenarios that AEMO must study in preparing the EAAP;
- modelling assumptions for the EAAP;

¹ See <https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem>

- components of a GELF that a Scheduled production unit must include in a GELF submitted under Rule 3.7C(g);
- the forms of the GELF sufficient for a Scheduled production unit to meet the requirements of Rule 3.7C(g);
- variable GELF parameters that are likely to have a material impact on the GELF;
- circumstances where a GELF submitted under Rule 3.7C(g) can apply to a collection of scheduled production units that face common energy constraints due to their geographic location, access to fuel source or another similar reason;
- the form of information to be submitted by each production unit in accordance with Rule 3.7C(e);
- arrangements for managing the confidentiality of information submitted to AEMO under Rule 3.7C.;
- when a Scheduled *production unit* is required to update a GELF under paragraph (h)(2).

3.1. Scenarios that must be studied in preparing the EAAP

The following scenarios will be included in the EAAP:

- (i) Central scenario – based on the most likely fuel availability used for generation purposes e.g. gas, coal, diesel, hydrogen and water resources. Water inflows should be based on the average rainfall recorded over the past 10 years.
- (ii) *Low Rainfall* scenario – based on the most likely fuel availability for thermal production units (as per the *Central* scenario) and considering water availability reflecting rainfall recorded in a specific historical period.
- (iii) *Low Thermal Fuel* scenario – based on 90% probability of exceedance (POE) energy availability (an estimate that is expected to be exceeded 9 out of 10 years) for thermal generators that should consider applicable limitations for each site, including the potential impacts of wet coal, longwall moves, train and truck deliveries, loader outages and likely market limitations. The scenario is not designed to reflect a disaster situation, but instead to reflect coincident energy shortfall situations that apply to each site from time to time.

Where the conditions associated with 90% POE energy availability, as applicable for each site, could reasonably occur for multiple months, participants are requested to submit energy limits for the entire 24 month horizon consistent with these conditions.

Where the conditions associated with 90% POE energy availability, as applicable for each site, would only reasonably occur for a duration of a month or less, participants are requested to submit energy limits consistent with these conditions for January and June each year only. All other months should be submitted consistent with the central scenario.

Hydro generators should submit water inflows consistent with the Central scenario.

(Collectively referred to as '**Scenarios**').

3.1.1. Sensitivities in the EAAP

When AEMO publishes sensitivities in the EAAP they will state the relevant assumptions and give a qualitative indication of the probability of each sensitivity.

3.2. Modelling assumptions for the EAAP

3.2.1. Modelling of demand in the EAAP

All EAAP scenarios will be assessed using demand forecasts from the ESOO scenario that is considered most likely, or Central.

3.2.2. Modelling for the EAAP

All existing and new operational production units that meet AEMO's commitment criteria are included in the EAAP, consistent with the methodology applied to the ESOO.

Scheduled capacities for each unit, as submitted to AEMO's Generation Information page⁵ will be used to model the capacity of each unit per season. AEMO applies scheduled outages to these units in EAAP only in circumstances where material outages submitted to *MT PASA* are specified as not being recallable.

Semi-scheduled production units, will be modelled consistent with the ESOO.

Retiring production units that are considered operational will be modelled as unavailable after the decommissioning date published on the AEMO Generation Information page, applying a methodology consistent with the ESOO.

The *EAAP* will use unplanned outage data collected on an annual basis for the purpose of producing publications such as *ESOO*, *MT PASA*, *EAAP* and the ISP.

Static and variable GELF parameters are then applied to each scheduled production unit, consistent with the EAAP scenario specification.

3.2.3. NEM Network model

Generator marginal loss factors, transmission inter-regional loss factors and power system and network constraints are applied consistent with the ESOO.

3.2.4. Energy limitations

AEMO will apply variable GELF parameters to the EAAP for each scheduled participant, or collection of scheduled participants for which a GELF submission has been requested. AEMO will apply static GELF parameters where relevant only to the degree they apply to the unit/s and scenario narrative of each EAAP scenario. In addition to GELF parameters submitted for each participant, or collection of scheduled participants, AEMO may apply grouped limitations for relevant scheduled production units that utilise a common fuel supply based on appropriate

⁵ The AEMO Generation Information webpage can be accessed at: <http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information>.

regional analysis. For example, AEMO may apply regional gas supply limits based on the outputs of GSOO modelling, or diesel supply limits based on appropriately rigorous supply chain analysis.

AEMO will apply hydro modelling assumptions consistent with the ESOO, which requires that all storages return to the starting storage value by the end of the forecast year, thereby ensuring that storages are not modelled to deplete within each forecast year. In cases where AEMO becomes aware that reliability outcomes are being affected by the static end of year storage levels, a sensitivity will be published demonstrating the impact of moderate inter-year sharing of storages.

3.3. Components of static *GELF* parameters that Scheduled production units must include in a *GELF* submitted under Rule 3.7C(g)

Components of a *GELF* to be submitted must be on the basis of *production units*. Components of a *GELF* can be submitted for groups of *scheduled generating units* provided the impact of the energy limitation applies across the *generating units* in the group.

The components of a *GELF* should include:

- power station or group name (this will be defined by AEMO in consultation with each participant);
- Units included in the power station (this will be defined by AEMO in consultation with each participant);
- type of primary fuel used (coal, natural gas, hydro etc);
- type of secondary fuel used (If applicable);
- maximum capacity for each fuel type;
- Monthly minimum and maximum storage levels for primary (and secondary if applicable) fuels or reservoirs;
- Monthly expected inflows for primary (and secondary if applicable) fuel or reservoirs in ML or MWh (as specified by AEMO);
- Expected storage for primary (and secondary if applicable) fuel, or water at the beginning of the month in ML or MWh (as specified by AEMO);
- Monthly inflows for which a firm contract for supply applies for primary (and secondary if applicable) fuel in MWh (if requested by AEMO);
- Monthly limits on continuous operation for both primary (and secondary if applicable) (If requested by AEMO);
- Monthly limits on unit starts (If requested by AEMO);
- Monthly expected number of unit starts (If requested by AEMO);

3.4. The forms of the GELF sufficient for a Scheduled production unit to meet the requirements of Rule 3.7C(g)

Scheduled production units should submit a *GELF* representing energy or operating limitations likely to be experienced by their *power stations*.

Energy limitations in a *GELF* could be due to (but not limited to):

- limitations on a primary energy source (i.e. coal, gas or availability/allocation of water for hydro power generation);
- limitations on power station services (i.e. cooling and demineralised water, high cooling water temperatures, boiler feed water, etc.);
- environmental issues, such as emission limits, operation allowed only at specific times of the day/week, etc.; and
- limits on units starts or continuous operation.

3.5. Variable parameters to be specified in a GELF

The variable parameters *Scheduled production units* must submit in a *GELF* should cover the full *study period* and have a monthly resolution, unless a different resolution has been previously agreed with AEMO.

A separate set of variable *GELF parameters* should be submitted for each of the *Scenarios* included in the *EAAP*.

Water-related energy limitations included in *forecast generation capability* submitted as a variable *GELF parameter* should be based on the known current share of water available for *generation*, as advised by jurisdictions and water authorities, without assuming that water allocations above this level would be made available in the future.

Variable GELF parameters to be submitted for scheduled production units

- Monthly energy output limits or water inflows under the EAAP Scenarios that consider all relevant operational characteristics of the site;
- Accompanying brief explanation of each of the EAAP scenario energy limitations and the cause of these restrictions.

3.6. Circumstances where a GELF can apply to a collection of Scheduled production units that face common energy constraints due to their geographic location, access to fuel source or another similar reason

The *GELF* can be submitted for any *production units* within a *power station* or a group of power stations that may have common *energy constraints* and are owned by the same participant.

In addition to *GELF parameters* submitted for each participant, or collection of scheduled participants, AEMO may apply grouped limitations for relevant scheduled production units that

utilise a common fuel supply based on appropriate regional analysis. For example, AEMO may apply regional gas supply limits based on the outputs of the most recent Gas Statement of Opportunities (GSOO) modelling, or diesel supply limits based on appropriately rigorous supply chain analysis.

3.7. The form of information to be submitted by each *Scheduled production unit* in accordance with Rule 3.7C(e)

The *GELF parameters* are to be submitted by each *Scheduled production unit*, in a format developed by AEMO for this purpose.

The *GELF parameters* must be submitted by each *Scheduled production unit* within three weeks from the time AEMO issues a request for *EAAP* reporting.

To assist with resource planning AEMO will target an *EAAP* publication date of end of August each year (as part of the annual ESOO publication), with the deadline for submitting a *GELF* being before the end of April (in line with unplanned outage rate data collection).

3.8. When a *Scheduled production unit* is required to update a *GELF* under paragraph (h)(2)

Participants should revise and re-submit their *GELF* in circumstances where there has been a material change which has an impact on the energy constraints associated with that *GELF*. When assessing the materiality of a change, participants should assess against the last published *EAAP* Central scenario only.

Where AEMO considers it necessary to produce another *EAAP*, consistent with *NER* 3.7C(d)(2), it will only consider requesting updated data from relevant participants where it believes *GELF parameters* have changed materiality.

3.9. Information to be included in the publication of the *EAAP*

The *EAAP* will be published as a section in the *ESOO* and will be available to all Market Participants and will include the following items for each of the Scenarios on regional basis:

- Monthly *USE* for the study period in *GWh*; and
- *USE* for the first 12 months and for the second 12 months in the study period in *GWh*. Monthly energy generation for the study period in *GWh* will be provided on a *NEM-wide* basis.

AEMO will make available an estimate of the total energy production of each participant's scheduled production unit per month for the period of the *EAAP*, on request following publication.

3.10. Arrangements for managing the confidentiality of information submitted to AEMO

Subject to the requirement to *publish* the *EAAP*, the *GELF* information submitted by the *Scheduled production units* for the purposes of the *EAAP* will be treated as *confidential information* in accordance with the *Rules*. AEMO may publish technology or regional

aggregates of submitted GELF information, where such aggregates protect the confidentiality of individual GELF submissions.

Version release history

Version	Effective date	Summary of changes
1.8	24 April 2023	Final report, implementing updates as per the Reliability Forecasting Guideline and Methodology Consultation
Draft 1.7		Draft for consultation update, including changes which are effective from 3 June 2024 under the National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13
Final 1.6	7/9/2020	AEMO Forecasting
Draft 1.5	25/5/2020	AEMO Forecasting – Philip Travill
Final 1.4	21/10/2016	AEMO Supply Planning – Rimjhim Kapoor
Draft 1.3	9/9/2016	AEMO Supply Planning – Rimjhim Kapoor
Draft 1.2	2/6/2016	AEMO Supply Planning – Rimjhim Kapoor
Final 1.1	14/1/2013	AEMO – Monica Burkett and Pablo Uribe Gomez
Final 1.0	30/6/2009	EAAP WG
Draft 0.2	12/5/2009	EAAP WG
Draft 0.1	27/2/2009	EAAP WG