Reliability Forecasting Guidelines and Methodologies consultation

Stakeholder workshop

Stage 2

13 February 2023

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We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past, present and emerging.

Agenda

- Review of AEMO's proposals and stakeholder feedback and revised approaches (30 mins)
- Q&A (90 mins)

Focus on five consultation topics:

1. Energy Adequacy
    a) EAAP scenarios
    b) Generator Energy Limitations Framework (GELF)
2. Treatment of new generators, transmission and aggregated DER projects
3. Random outage parameters for generators and inter-regional transmission elements
4. MT PASA generator status and recall times
5. RRO reliability gap calculations

Introduction

Reliability Forecasting Guidelines and Methodologies are currently under consultation

Five guidelines/methodologies are under consultation:

- Reliability Standard Implementation Guidelines (RSIG)
- Energy Adequacy Assessment Projection (EAAP) Guidelines
- Generation Information Guidelines
- ESOO and Reliability Forecast Methodology
- Medium Term Projected Assessment of System Adequacy (MT PASA) Process Description

These guidelines and methodologies specify:

- What information participants are required to provide AEMO to inform these forecasts, and the frequency of such requests
- The process and assumptions AEMO applies to develop the forecasts.
- How AEMO applies the reliability standard, interim reliability measure and retailer reliability obligation.

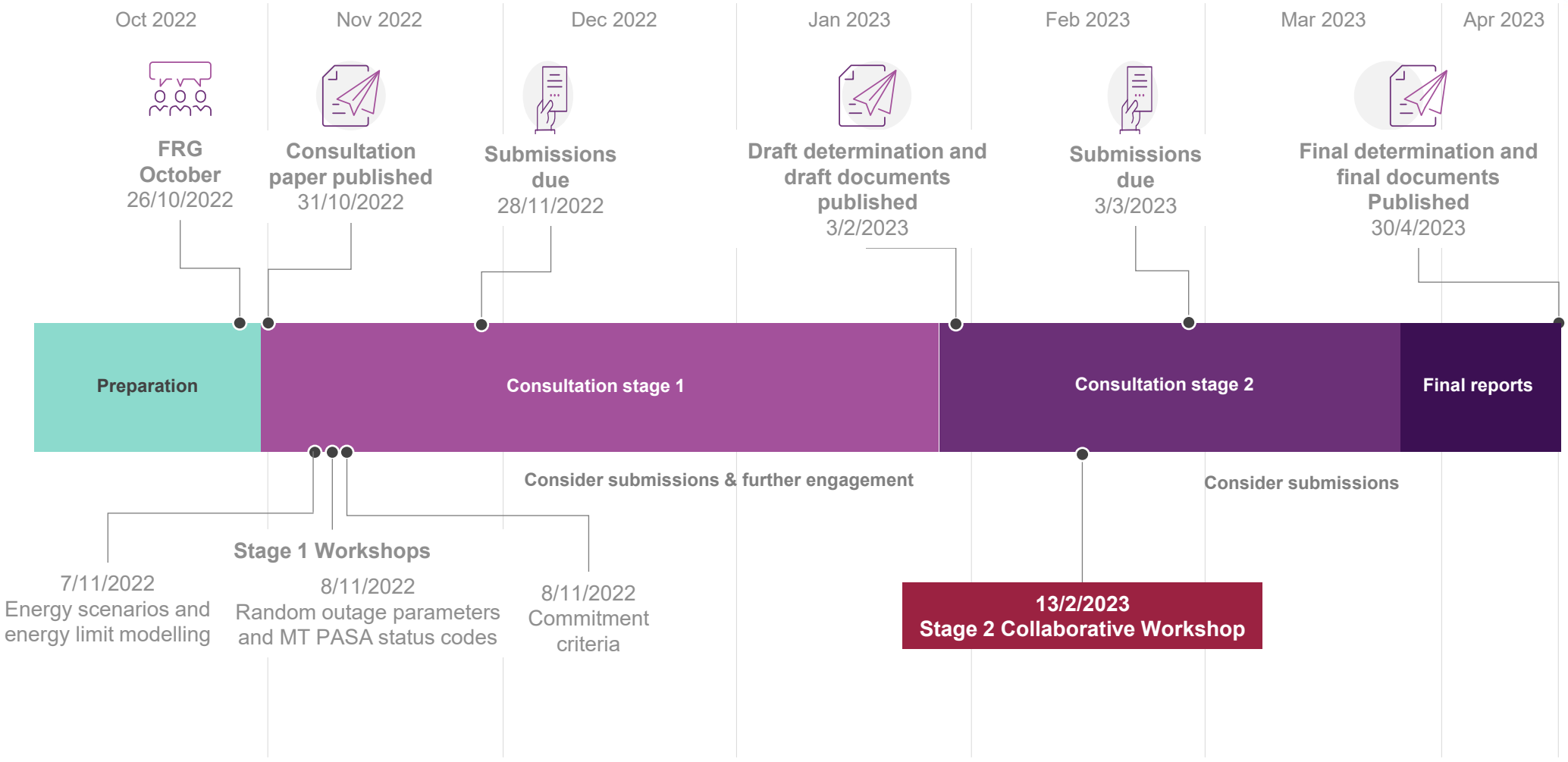
Several factors initiated this consultation

1. NER and Forecasting Best Practise Guidelines (FBPG) consultation requirements.
2. Implementation of the ESB NEM2025 ‘Enhancing information on generator availability in MT PASA’ rule change by April 2023.

3. Stakeholders suggested changes in response to the 2022 ESOO:
   - Stakeholders suggested that AEMO’s commitment criteria was unduly conservative, and excluded many very well advanced projects, thereby identifying excessive reliability risks.
   - Following the first ever T-1 RRO request made by AEMO to the AER in 2022, it was clear that the current consulted-on methodology for identifying reliability gaps for RRO purposes was not fit for purpose.

4. In response to model performance and market dynamics observed during the June 2022 market event and other events, changes were considered important:
   - Current reliability studies focus on capacity adequacy, rather than energy adequacy, hence did not perform well in providing market advice on the risks arising from energy shortfalls.
   - Certain generator outage categories (non-discretionary planned and maintenance outages) which are not currently considered in reliability forecasts were observed worsening supply adequacy.

The consultation on reliability forecasting guidelines and methodologies is in its second stage



Consultation topics

This section outlines AEMO's original proposals, stakeholder submissions and revised approaches for each consultation topic

1a - Energy Adequacy – EAAP scenarios
Initial proposal

AEMO originally proposed the following EAAP scenarios:

1. ***Central*** scenario (previously the *short-term average rainfall scenario*) – the most likely fuel availability from gas, coal, diesel, hydrogen and water resources (based on the average rainfall recorded over the past 10 years).
2. ***Low Rainfall*** scenario – based on the most likely fuel availability for thermal generators (as per the *Central* scenario) and considering water availability reflecting rainfall recorded in a specific historical period.
3. ***Low Thermal Fuel*** scenario – based on worst-case coal, gas, diesel and hydrogen availability for thermal generators and considering a high rainfall scenario reflecting the maximum rainfall recorded over the past 10 years, that may trigger water release challenges for hydro-electric generators.
4. Any other scenario that AEMO reasonably considers will have a material impact on the EAAP.

AEMO proposed to discontinue the *Long-term average rainfall* scenario

1a - Energy Adequacy – EAAP scenarios
Stakeholder feedback

- No concerns expressed for the Central and Low Rainfall proposed scenarios or with proposal to discontinue the *Long-term average rainfall* scenario.
- While most submissions expressed in-principle support for AEMO's proposal to include a scenario relating to low thermal fuel supplies, several stakeholders noted some concerns, such that it may be excessively conservative, that it may not address any needs, and that it is inherently uncertain.
- Stakeholders were generally not in support of AEMO's proposal to create any other scenarios without stakeholder consultation.

1a - Energy Adequacy – EAAP scenarios
Revised proposal

1. ***EAAP Central scenario*** (renamed existing scenario) the most likely energy adequacy outlook.
2. ***Low Rainfall scenario*** (existing scenario) energy adequacy outlook under drought conditions.
3. ***Low Thermal Fuel scenario*** (a new scenario) based on 90% POE energy availability for thermal generators and water availability as per the EAAP Central scenario. Participants are advised to consider the potential impacts of wet coal, longwall moves, train and truck deliveries, loader outages and likely market limitations when identifying their energy availability under this scenario. 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.
4. AEMO no longer proposes to include any other scenario that it reasonably considers will have an impact on the EAAP on the basis that: LRC will only be declared on the EAAP Central scenario, or the scenario that it considers most likely; AEMO is able to publish additional sensitivities; and the GELF parameters can be specified in the EAAP Guidelines.

1b - Generator Energy Limitation Framework (GELF)
Initial proposal

AEMO proposed to collect more information from thermal generators over the two year horizon in order to support the new scenarios and modelling.

For hydro power schemes:

- Reservoir storage and projected inflows (per scenario).
- Operational parameters including minimum and maximum levels, limits on continuous operation, seasonal parameters, and outflow requirements or restrictions.

For non-hydro power stations:

- Current and most likely projected onsite storage of primary and secondary fuels (where applicable)
- Most likely projected inflows of primary and secondary fuels (where applicable).
- Currently contracted inflows of primary and secondary fuels (where applicable).
- Cooling water and demineralised water storage availability and limits.
- Energy output limits per scenario (in megawatt hours [MWh]).
- Operational parameters including minimum and maximum storage levels per fuel type, limits on continuous operation, seasonal parameters, and requirements or restrictions to operate.

1b - Generator Energy Limitation Framework (GELF)
Stakeholder feedback

- Only relevant and required parameters should be added, to reduce the burden on market participants.
- Proposed parameters may be difficult to provide with degree of certainty.
- Request further clarification of additional information required

1b - Generator Energy Limitation Framework (GELF)
Revised proposal

- AEMO released a draft template for comment. This includes:
  - Minimum and maximum storage levels for all fuels
  - Monthly expected inflows and storage levels for all fuels
  - Monthly contracted inflows for all fuels
  - Operational limits on continuous operation, and number of starts.
  - Expected number of starts
  - Monthly energy limits for the three EAAP scenarios

- AEMO will work with generators to discuss any parameters or scenarios that may be problematic for them and welcomes specific feedback on the draft GELF template as part of Stage 2 of this consultation.

2 Treatment of new projects - Generators

- AEMO received feedback that its approach to considering generation projects was unduly conservative because it was excluding many well advanced projects.
- Forecast accuracy analysis however indicated that project commissioning delays were resulting in the over-forecast of generation availability.

Publication	Forecast operational capacity (MW)	Actual operational capacity (MW)	Difference (MW)
2019 ESOO (2019-20 summer period)	53,204	52,156	-1,048
2020 ESOO (2020-21 summer period)	55,997	53,887	-2,090
2021 ESOO (2021-22 summer period)	56,872	55,592	-920

- AEMOs updated proposal is to:
  - apply 6 month delays to ‘committed’ and ‘committed*’ projects that have not yet met the commissioning requirements of their first hold point.
  - Include all anticipated projects in the ESOO Central scenario (new approach), but apply a 1 year delay to the dates provided.
- Stakeholder feedback generally supported this proposal, however AEMO seeks feedback on whether this balances the risk of under- and over-forecasting of available capacity.

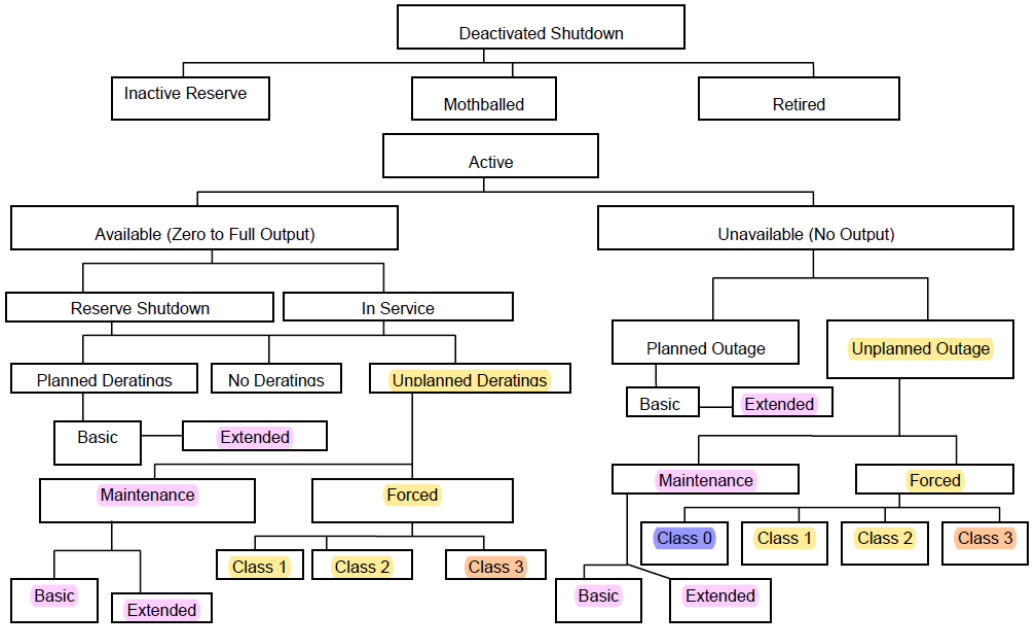
2 Treatment of new projects – transmission and DER

- The current ESOO methodology applies a different commitment criteria to transmission projects than the ISP and other AEMO applications, which has caused numerous implementation challenges.
- AEMO proposed to:
  - Apply a consistent commitment criteria for transmission projects to other publications
  - Apply a 1 year modelling delay to all anticipated transmission projects
- The current methodology applies all forecast DER over the entire ESOO horizon, despite some of that DER being optimised in the 'supply side' dispatch model when aggregated within a VPP. As such, the approach was inconsistent with generation and transmission.
- AEMO proposed to:
  - Apply only those aggregated DER (supply side like VPP and V2G) developments that could be identified as committed (enabling dynamic discharge in response to supply adequacy)
  - Include all forecast DER in the forecast, but model as uncoordinated (applying a static operational profile).
- Participant feedback was generally supportive of these approaches.

3 - Random outage parameters
Initial proposal

- AEMO proposed two new categories for inclusion:
  - Unplanned outages, which have occurred while the unit was available, but not committed. This may include maintenance outages as defined by IEEE 762-2006.
  - Planned outages that have extended beyond their original timeframes due to complications and unexpected issues.
- No changes proposed to the continued exclusion of planned outages on the basis that they are assumed to occur outside periods of supply scarcity

IEEE762-2006



3 - Random outage parameters
Revised proposal

- Participant feedback suggested that the IEEE762 categories that AEMO sought to include would include many discretionary outages
- Feedback suggested that the proposed definitions would over-estimate the rate of outage during periods of supply scarcity.
- AEMO accepted the participant suggestion to use the term ‘non-discretionary’ in its methodology and data request, rather than the IEEE 762-2006 definitions specifically, agreeing that this definition better meets the intent.
- To address concerns with multi unit and small sites, AEMO proposed materiality thresholds that aim to minimise the burden of providing outage data.

4 - MT PASA status code and recall times
Initial proposal

- AEMO proposed an implementation consistent with IEEE 762-2006, where recall times proposed to apply only to a subset of reason codes.

Status Category	Unit Status	Economic or physical	Recall time requirements
Deactivated shutdown	Inactive reserve	Economic	Mandatory
Deactivated shutdown	Mothballed	Economic	Mandatory
Deactivated shutdown	Retired	Economic	None
Available	No deratings	Not applicable	None
Available	Basic planned deratings	Physical	Mandatory if available
Available	Extended planned deratings	Physical	Mandatory if available
Available	Unplanned forced deratings	Physical	Mandatory if available
Available	Unplanned maintenance deratings	Physical	Mandatory if available
Unavailable	Basic planned outage	Physical	Mandatory if available
Unavailable	Extended planned outage	Physical	Mandatory if available
Unavailable	Unplanned forced outage	Physical	Mandatory if available
Unavailable	Unplanned maintenance outage	Physical	Mandatory if available

4 - MT PASA status code and recall times
Stakeholder feedback and revised proposal

- Generally supportive.
- Requested clarification of specific codes and their usage.
- Suggested use of alphabetic input codes for submissions.
- It was not clear what capacity the ‘recall time’ field would be recalling to.

- AEMO provided draft definitions of each code and additional examples of the use of recall times in the MT PASA process description.
- AEMO provided short-form codes to be used for submissions in the RSIG.
- the recall time should refer to the time taken to restore the unit to ‘normal’ operations (i.e., not a partial restoration).

5 - RRO reliability gap calculation
Initial proposal

- AEMO proposed an updated reliability gap calculation methodology to address numerous identified deficiencies with the current methodology in the 2022 ESOO.
- AEMO proposed to calculate the reliability gap as the capacity required to reduce expected USE to the relevant reliability standard, assuming the capacity is available in all periods of the year (rather than in a narrower reliability gap period).
- AEMO proposed to calculate the likely trading intervals and the reliability gap period such that the likely trading intervals of the reliability gap period contain a minimum of 90% of USE forecast over the financial year.
- AEMO proposed a flexible methodology to calculating the reliability gap period and trading intervals.

5 - RRO reliability gap calculation
Stakeholder feedback and response

- Stakeholder submissions generally agreed that the reliability gap calculation needs to change, including calculating the reliability gap across all periods of the year.
- Participants suggested a lower percentage for identifying the reliability gap period.
- Regarding reliability gap period and trading intervals methodology, participant feedback was mixed regarding the proposed methodology, with all submissions requesting additional analysis to quantify the change.
- In response AEMO has adjusted the minimum percentage to 80% and provided a proposed updated methodology and worked example.

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