Stakeholder Workshop Energy scenarios and energy limit modelling

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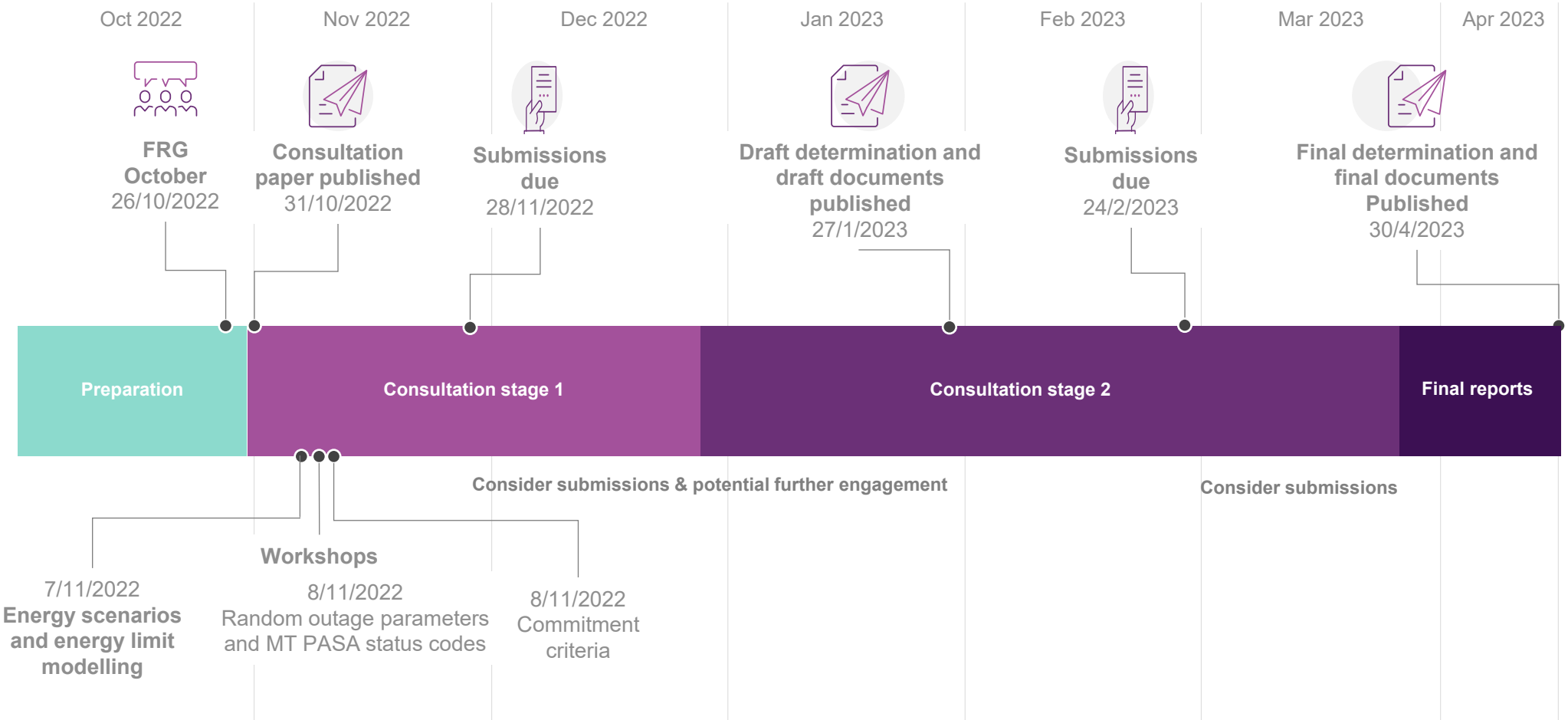
Purpose and consultation timeline

The purpose of this workshop is to *collaborate* with participants and interested parties to better inform stakeholder submissions and outcomes of AEMO's consultation on reliability forecasting guidelines and methodologies.



Energy adequacy methodology and scenarios

- Extremely low gas and coal availability events observed in June 2022 demonstrate the importance of such scenarios in future energy adequacy assessments.
- AEMO has identified opportunities to improve reliability forecasting models to model the impact of energy limits more effectively and efficiently should participants advise of material energy limits in future circumstances.
- AEMO requires additional inputs and model changes to appropriately understand the risks of energy limits, and to model the impact of energy limits effectively and efficiently, hence methodology changes and additional Generator Energy Limitations Framework (GELF) information are required from participants.

EAAP Scenarios

Three scenarios are specified in the current EAAP Guidelines that all relate to rainfall and drought and no scenarios relate specifically to thermal fuel limitations.

Current scenarios include:

- **Low rainfall** – based on rainfall experienced in a specific historical period.
- **Short-term average rainfall** – based on the average rainfall recorded over the past 10 years.
- **Long-term average rainfall** – based on the average rainfall recorded over the past 50 years, or the longest period for which rainfall data is available should this be less than 50 years.

EAAP Scenarios

AEMO proposes scenario flexibility to avoid the need for rules consultation in future:

- **Central scenario (previously the short-term average rainfall scenario)** – most likely fuel availability from gas, coal, diesel, hydrogen and water resources
- **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.
- **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.
- **Any other scenario** that AEMO reasonably considers will have a material impact on the EAAP.

AEMO proposes discontinuing the *Long-term average rainfall* scenario, on the basis that no risks arising from low rainfall have been identified in any recent EAAP.

Low reserve conditions

- While AEMO proposes to include numerous scenarios, it is proposed that AEMO continues to only declare Low Reserve Conditions (LRC) for scenarios that are reasonably probable.
- For example, expected unserved energy (USE) was forecast above the reliability standard in the 2018 EAAP for one of the scenarios, but AEMO did not declare LRC on the basis that this scenario was unlikely to occur.

GELF parameters

Currently AEMO can obtain GELF parameters, as specified in the EAAP Guidelines, only for the defined scenarios (the three scenarios relating to drought conditions).

GELF parameters currently include:

- Information about planned outages that are not flexible.
- Monthly generation output limits in gigawatt hours (GWh) for non-hydro power stations.
- Reservoir storage, inflow and operational parameters for hydro power schemes.

Operational parameters relating to thermal fuel limitation scenarios are not currently specified as GELF parameters.

GELF parameters

AEMO proposes to collect alternative GELF parameters that would be specified in the EAAP Guidelines for the proposed scenarios:

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

Energy modelling assumptions

- The modelling assumptions specified in the current EAAP Guidelines predominantly align with MT PASA modelling assumptions, with the EAAP model based on the most recent MTPASA run model.
- Planned outages submitted to MT PASA are moved away from periods of supply scarcity should the scheduled generator specify that this outage is flexible.

Energy modelling assumptions

AEMO proposes numerous changes to the energy modelling assumptions to increase the alignment between reliability, energy adequacy, and planning models:

- EAAP methodology and model to predominantly align with the ESOO, where GELF parameters will be added to the ESOO model, instead of the most recent MTPASA run model.
- EAAP to apply material outages submitted to MT PASA that are not recallable.
- EAAP to apply ISP operational assumptions – as documented in AEMO's Inputs, Assumptions and Scenarios Report (IASR) – that are relevant to each EAAP scenario. This may include minimum stable level, ramp rates, and/or minimum operational timeframes.
- Relevant GELF and ISP operational assumptions may be applied to all reliability forecasts.
- MT PASA submitted energy limits to be applied to the MT PASA Loss of Load Probability (LOLP) run.

AEMO proposes to target annual GELF collection in March-April, consistent with other ESOO data collection and will incorporate the EAAP analysis within the ESOO, published by the end of August each year.

Consultation Questions

1. Do you agree that current energy adequacy scenarios and methodologies are inadequate and require modification?
2. Do the proposed EAAP scenarios improve the breadth and strategic and operational insight on energy adequacy risks in the NEM?
3. Are the proposed expanded GELF parameters appropriate for the scenarios and energy adequacy insights proposed?
4. Are there alternative GELF parameters that AEMO should consider that would better achieve the NER and proposed EAAP scenario intent?
5. Is the proposed methodology for EAAP and other energy adequacy issues appropriate?
6. Are there any other issues AEMO should consider when assessing energy adequacy?

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