5 August 2024

RE: Consultation on Forward-looking Transmission Loss Factor Methodology

About Shell Energy in Australia

Shell Energy is Shell's renewables and energy solutions business in Australia, helping its customers to decarbonise and reduce their environmental footprint. Shell Energy delivers business energy solutions and innovation across a portfolio of electricity, gas, environmental products and energy productivity for commercial and industrial customers, while our residential energy retailing business Powershop, acquired in 2022, serves households and small business customers in Australia.

As the second largest electricity provider to commercial and industrial businesses in Australia[1], Shell Energy offers integrated solutions and market-leading[2] customer satisfaction, built on industry expertise and personalised relationships. The company's generation assets include 662 megawatts of gas-fired peaking power stations in Western Australia and Queensland, supporting the transition to renewables, and the 120 megawatt Gangarri solar energy development in Queensland. Shell Energy also operates the 60MW Riverina Storage System 1 in NSW. Shell Energy Australia Pty Ltd and its subsidiaries trade as Shell Energy, while Powershop Australia Pty Ltd trades as Powershop. Further information about Shell Energy and our operations can be found on our website here.

Key Points

The key points raised in this submission include:

- Shell Energy agrees with AEMO that the increase in variable renewable energy (VRE) generation raises questions as to whether the existing configuration and use of a single generator output reference year and minimal extrapolation logic still leads to reasonable approximations of future market dynamics.
- The use of a single generator output reference year is no longer fit for purpose in MLF modelling.
- Shell Energy recommends AEMO convene an industry working group to discuss and design a replacement for the single reference year approach used in determining MLFs.
- "Anticipated" status for new generation projects should not be sufficient for automatic consideration in the next year's MLF modelling
- The goal of MLF calculation simplicity should not over-ride robustness and accuracy
- AEMO should leverage its ISP and reliability modelling approaches to enhance storage and generator dispatch in the forward looking loss factor modelling for 2026/27

[1] By load, based on Shell Energy analysis of publicly available data.
[2] Utility Market Intelligence (UMI) survey of large commercial and industrial electricity customers of major electricity retailers, including ERM Power (now known as Shell Energy) by independent research company NTF Group in 2011-2021.

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General Comments

Shell Energy supports the proposal to transition the marginal loss factor (MLF) modelling process from the older TPrice software program to the new AEMO developed NEMLF software program and AEMO's Power System Simulator for Engineering (PSS®E) application. We see some benefit in undertaking load flow simulation and generation balancing separately using these two applications. We understand that the NEMLF software program will be supplied upon request to participants and that PSS®E is commercially available industry standard software. We agree that this change should support improved transparency in the calculation of forward looking loss factors (FLLF).

We note that this change alone will not necessarily improve the accuracy of the calculation of FLLF compared to real time actual losses over the 12 month study period. Shell Energy considers further work and consultation is required to achieve improved accuracy as the NEM transitions to higher levels of weather dependent renewable energy generation which results in significant variations in actual generator output compared to that used in the modelling. Shell Energy agrees with AEMO that the increase in variable renewable energy (VRE) generation raises questions as to whether the existing configuration and use of a single generator output reference year and minimal extrapolation logic still leads to reasonable approximations of future market dynamics.

We recommend AEMO promptly constitute an industry working group to consider replacing the current use of a single generator output reference year and minimal extrapolation logic. Shell Energy looks forward to working with AEMO to achieve improvements in the area of inputs to the FLLF calculation so that participants will be confident that outcomes from the FLLF modelling achieve a reasonable level of practical accuracy.

AEMO has proposed in section 2.3.2 of the issues paper that in addition to the primary objectives of this FLLF consultation, the consultation should also achieve the following secondary objectives:

- Transparency of the MLF calculation process.
- Simplicity of the MLF calculation process.

We agree with, and fully support, the first of these two secondary objectives. However, we are concerned that in seeking to implement the second of the two objectives the accuracy of the calculation process may be compromised. We therefore suggest the following replacement wording to section 2.3.2:

> *The MLF calculation process must be easily understandable from a market participant and other interested stakeholder perspective.*

Issues, options and proposals for consultation

Treatment of controllable DC interconnectors

Shell Energy agrees that improving the treatment of controllable DC network components in the modelling has the potential to improve the accuracy of the FLLF model. However, we don't support the implementation of AEMO's proposed option 1 to all controllable DC interconnectors. We support option 2(b) where a DC network component or interconnector would be modelled the same as any other AC network component or interconnector in the modelling. We also note that this may take time to implement and that this may require any change of the regulated status of Basslink for FY 25/26 to be initially implement using proposed Option 2(a). This however must be seen as only a temporary step to implementing Option 2(b) for the 2026/27 FLLF modelling.

Treatment of proposed new generators, loads or network components

It is unclear to Shell Energy why FLLF studies should include "anticipated" developments. Generators, loads or network components that are classified as "anticipated" in AEMO's information portals at the time the modelling is undertaken are unlikely to be sufficiently advanced to be included in the next year's FLLF study. We recommend that AEMO continue including only generators, loads and network components that have achieved AEMO's "committed" or "committed*" classification. Notwithstanding, we do support AEMO undertaking additional assessment as to the ability of any new project(s) which are to be included in the FLLF modelling to achieve its nominated full commercial use date via ongoing active survey with the project proponent prior to their inclusion in the FLLF modelling for the target year.

Design of minimal extrapolation levels

As noted previously, Shell Energy considers that in the transitioning NEM world the continued use of a single generator output reference year and minimal extrapolation logic is no longer fit for purpose. It should also be acknowledged that it is these components of the calculation methodology that results in large variation in FLLF allocation between years as well as variation between the FLLF and actual losses. However, we acknowledge that moving from an existing process will take time. We therefore support an interim step to increase the number of level definitions and adjustments to level ordering as proposed by AEMO. We agree that these levels should group technologies with similar market behaviour and also agree that the modelling should consider if minimum loads for thermal baseload units should be an input to the model and that level ordering could be different for periods of supply surplus or deficit. However, the use of minimum loads for thermal baseload units adds the question as to whether the unit is anticipated to be in-service or not. This will require improvements in information sharing between participants and AEMO which may be confidential in nature. Notwithstanding, we don't consider that the interim change is sustainable over the long term and AEMO should promptly initiate steps to constitute a working group to move away from the use of a single generator output reference year and minimal extrapolation logic from the 2026/27 FLLF calculation year.

Cluster resolution

Shell Energy remains unconvinced that the proposed clustering of generating units will provide tangible benefits. This is because the proposed clusters should not be applied across different generator resource groupings and because of the reduction in modelling accuracy if clustering is applied where multiple generators are located behind the same or multiple interactive network constraints. This issue is further highlighted by the discussion of the negative impacts of clustering in section 3.3.3. We are not opposed to clustering if the modelling process includes transparent consultation and detailed information as to how the selected clusters were determined. It would also be necessary to provide further analysis detailing the impacts of clustering on the accuracy of output from the model to ensure stakeholder confidence in the approach.

Representation of clusters in constraints

This section highlights a significant disadvantage from the use of clusters in the FLLF modelling. The proposed transfer of generating units from the left hand (controlled) side to the right hand (uncontrolled) side of the constraint equation in the FLLF calculation should match the less than 0.07 constraint co-efficient value used in the NEMDE so as to more closely reflect actual dispatch outcomes.

Option 2 requires assumptions regarding unit commitment and minimum generator load. Consideration should be given to an approach that would see multiple thermal units treated as one where they are located on one site. Rather than modelling each unit individually, these multiple units should be modelled as one single unit or DUID with a suitable and transparent minimum load to reflect potential unit commitment and decommitment

outcomes. This would be appropriate as, where multiple baseload thermal units exist at one location, the individual units would generally be in the same constraint equations and technology group.

Handling of storage – Batteries and Pumped Hydro

Whilst Shell Energy is supportive of the proposal to implement Option 1 as an interim and temporary measure, by the time of modelling of the 2026/27 FLLF improved generator dispatch modelling will be required, not only dealing with the storage issue but also the variability of weather dependent renewable generation and the impact of this on other scheduled generators. Fortunately, it isn't necessary to "reinvent the wheel" in this area as the ISP and reliability assessment models are both already undertaking these somewhat complex dispatch solutions under different prevailing weather conditions. Given this, we consider achieving improvements in this area for the 2026/27 FLLF modelling can be met. As previously recommended, AEMO should promptly constitute a new working group to facilitate these changes. An alternative to the use of historical outputs for Option 1 would be for the outputs of the ISP and reliability assessment modelling to be used to fix the inputs into the FLLF model and adjust other generating resources around this.

Minor and administrative changes

No comments.

Appendix C – Changes to the calculation philosophy

As set out previously in this submission, in our view the current calculation methodology (philosophy) of a single generator output reference year and minimal extrapolation logic is no longer fit for purpose in the NEM as it transitions to higher levels of weather dependent renewable generation and hydro generators output coupled with the question of storage systems variable consumption and generation. Improvements in the FLLF calculation methodology are warranted to smooth out these naturally occurring variations to improve the accuracy and reduce the year-on-year variation of MLF's allocated to both generators and loads.

To discuss any issues raised in this submission, please contact Peter Wormald (peter.wormald@shellenergy.com.au)

Yours sincerely,

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