17 January 2020

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Mr Charles Popple
Ms Michelle Shepherd
Ms Allison Warburton
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Australian Energy Market Commission
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Dear Commissioners,

AEMC 2020, Transmission Loss Factors, Draft Determination

We welcome the opportunity to comment on the AEMC's draft determination on changes to Transmission Loss Factors.

EnergyAustralia is one of Australia's largest energy companies with around 2.6 million electricity and gas accounts in NSW, Victoria, Queensland, South Australia, and the Australian Capital Territory. We also own, operate and contract an energy generation portfolio across Australia, including coal, gas, battery storage, demand response, solar and wind assets with control of over 4,500MW of generation capacity in the National Electricity Market (NEM).

We support the Commission's draft decision to maintain the existing marginal loss factor methodology and allocation of intra-regional settlement residues for the reasons the Commission has outlined in the Draft Determination, principally the provision of important locational signals, and the marginal pricing design of the NEM.

We support the removal of the clause that require AEMO to use regression analysis, provided participants have clarity and confidence in any changes.

We recognise that providing AEMO flexibility within the rules to modify the loss factor methodology could lead to improvements in the accuracy of calculation; noting that AEMO has not provided any substantive information about how other methodologies may be superior to regression analysis.

It is important that stakeholders have adequate opportunity to engage with AEMO and assess any future proposed changes. There should be a clear requirement for this as changes in MLF methodology, while beneficial overall, could have unforeseen financial impacts on participants that need to be clearly understood to minimise the impact of the change. It is also important that methodologies are not changed too frequently as this could create uncertainty within the market. AEMO should be required to quantifiably demonstrate the improved accuracy of any change in methodology during a consultation process.

Further, AEMO should be required to provide as much information as possible regarding loss factors, to participants to support their investment decision making. For example, we would encourage standard deviations and intra-day information such as scatter plots

and / or time series views of varying loss factors to be published. This would give participants insight into the degree of variation, and therefore underlying drivers in changes in losses.

We question the merits of the proposal to move from half-hourly intervals to four-hourly intervals.

The merits of this change are not substantiated and appear to contradict the Commission's preference to eventually transition to dynamic loss factor calculations, which, implicitly, would be calculated on a 5-minute basis.[1] [2]

Furthermore, and in our view most importantly, AEMO has not provided any numerical evidence that a change in the length of interval would still satisfy the requirement of clause 3.6.2(e)(2) to

> *"closely as is reasonably practice, describe the average of the marginal electrical energy losses for electricity transmission network connection point and regional reference node in the same region for each trading interval of the financial year in which the intra-regional loss factor applies."*

The power system is becoming increasingly variable at both a 30-minute and a 5-minute level. This is due to a combination of increasing volumes of intermittent supply, both grid-scale and behind the meter, as well as smart devices and appliances that can rapidly change demand profiles to become non-traditional patterns. The transition to Five-Minute Settlements is expected to enhance these effects as both supply and demand side respond to sharper price signals.

Averaging over multiple trading intervals will serve to dull accuracy, reducing the valuable locational signal that loss factors provide. With the current approach, sharp changes in a generator's loss factor are captured by the calculation methodology. However, extending the interval could conceal these effects, blunting the provision of information about marginal efficiencies. A simple example of a where accuracy could be compromised by moving to a longer duration interval beyond 30-minutes is a peaking generator, or fast ramping asset such as a battery, only being dispatched for one trading interval. See example in attached Appendix.

AEMO thinks that 30-minute based MLFs are more difficult for market participants to produce, understand and replicate, compared with calculations using longer intervals. It is not apparent that this change has been requested, or supported by participants in pursuit of clarity and understanding MLFs better. We do not agree that longer interval MLFs will be easier to understand or reproduce. In fact, it may make understanding MLFs more complex due to the reduced granularity in the calculation and additional steps required to convert existing data to a different granularity.

Should this change proceed, there would need to be adequate analysis, debate and discussion as to how a 24-hour period was grouped into 6 intervals as this could have an impact on MLF outcomes for generation assets that only operate at particular times.

[1] Following the commencement of 5 Minute Settlements in July 2021 trading intervals will be defined as a 5-minute period, rather than 30-minute period.

[2] As outlined in both the Transmission Loss Factor Draft Determination, and the 2019 Co-ordination of Transmission and Generation Investment Discussion Paper

Further, the time saving benefits in data cleansing and calculation processing seem overstated and would, in practice, be negligible. In fact, additional calculation steps will be required to convert trading interval data to 4-hourly data, and the same amount of data will need to be cleansed. There may be improvements in calculation times, but these would be negligible.

We support the decision remove requirements to treat MNSPs as invariant.

If you would like to discuss this submission, please contact me on 03 9976 8482, Georgina.Snelling@energyaustralia.com.au.

Regards

Georgina Snelling
Industry Regulation Lead

APPENDIX: Example of different MLF outcomes for a Peaking Generation plant that operates for one half-hour period, with 30-minute and 4-hour MLF calculations

Peaking Generation MLF estimation (Illustrative)

NB: 4 Hour data has been calculated as the average of 30-minute data

30-minute intervals

		Generating at end of a 4-hour period		Generation at start of a 4-hour period	
		MLF *(Sum C/Sum B)*	**0.960**	**MLF** *(Sum E/Sum D)*	**1.000**
Time interval	**Location LF** *(A)*	**Peaker Generation (MW)** *(B)*	**Marginal LF** *(A*B)* *(C)*	**Peaker Generation (MW)** *(D)*	**Marginal LF** *(A*D)* *(E)*
0:30	1.00	0	0	0	0
1:00	1.00	0	0	0	0
1:30	1.00	0	0	0	0
2:00	1.00	0	0	0	0
2:30	1.00	0	0	0	0
3:00	1.00	0	0	0	0
3:30	1.00	0	0	0	0
4:00	1.00	0	0	0	0
4:30	1.00	0	0	75	75
5:00	1.00	0	0	0	0
5:30	1.00	0	0	0	0
6:00	1.00	0	0	0	0
6:30	0.99	0	0	0	0
7:00	0.97	0	0	0	0
7:30	0.96	75	72	0	0
8:00	0.95	0	0	0	0
8:30	0.93	0	0	0	0
9:00	0.91	0	0	0	0
9:30	0.89	0	0	0	0
10:00	0.87	0	0	0	0
10:30	0.85	0	0	0	0
11:00	0.83	0	0	0	0
11:30	0.81	0	0	0	0
12:00	0.80	0	0	0	0
12:30	0.79	0	0	0	0
13:00	0.78	0	0	0	0
13:30	0.78	0	0	0	0
14:00	0.79	0	0	0	0
14:30	0.80	0	0	0	0
15:00	0.81	0	0	0	0
15:30	0.83	0	0	0	0
16:00	0.85	0	0	0	0
16:30	0.87	0	0	0	0
17:00	0.89	0	0	0	0
17:30	0.91	0	0	0	0
18:00	0.93	0	0	0	0
18:30	0.95	0	0	0	0
19:00	0.97	0	0	0	0
19:30	0.99	0	0	0	0
20:00	1.00	0	0	0	0
20:30	1.00	0	0	0	0
21:00	1.00	0	0	0	0
21:30	1.00	0	0	0	0
22:00	1.00	0	0	0	0
22:30	1.00	0	0	0	0
23:00	1.00	0	0	0	0
23:30	1.00	0	0	0	0
0:00	1.00	0	0	0	0

4-hour intervals

		Generating at end of a 4-hour period		Generation at start of a 4-hour period	
		MLF *(Sum H/Sum G)*	**0.984**	**MLF** (Sum J/Sum I)	**0.984**
Time interval	**Location LF** *(F)*	**Peaker Generation (MW)** *(G)*	**Marginal LF** *(F*G)* *(H)*	**Peaker Generation (MW)** *(I)*	**Marginal LF** *(F*I)* *(J)*
4	1.00	0	0	0	0
8	0.98	9.38	9.22	9.38	9.22
12	0.86	0	0	0	0
16	0.80	0	0	0	0
20	0.94	0	0	0	0
24	1.00	0	0	0	0

Difference in MLF between using 30-minute and 4-Hour

Generating at End of 4-hour period:	**-0.024**
Generating at Start of 4-hour period:	**0.016**

With 30-minute intervals, the peaker's MLF captures the detail of coincident local MLF value. With 4-hour intervals, there is no difference in MLF as temporal local MLF detail is lost. The MLF signal is blunted and doesn't reflect the impact of the time of generation on marginal losses.