

16 February 2024

Australian Energy Market Operator

Submitted to: ISP@AEMO.com.au

Submission to AEMO's draft 2024 Integrated System Plan

Delta Electricity welcomes the opportunity to provide commentary on the AEMO draft 2024 Integrated System Plan (ISP). Delta has prepared a short submission to highlight some of the concerns it has raised in previous iterations of ISP engagement and the need for IPS to also represent a more realistic development plan that provides greater transparency on the more likely development path and what investment is needed.

The ISP needs to send the right investment signal

Delta understands the ISP, in essence, is a backward engineered roadmap to transition the power system and deliver the infrastructure needed to meet the future needs of the power system. This plan is designed with the following hard-wired outcomes, to:

- achieve the Commonwealth Governments Net Zero target by 2050;
- achieve the carbon emission target for 2030; and
- also apply adjustments based on individual jurisdictions' carbon targets.

This is then presented as a plan and the intent by AEMO, through the ISP processes, is to drive decisions and responses by NEM participants, a range of investors, TNSPs, governments, and consumers. That is, AEMO is seeking to use the ISP as a primary driver for key investment decisions designed to achieve government targets.

Delta considers this is potentially dangerous as it sets expectations that will never be met in the timelines set. This is highlighted by AEMO itself that large scale renewables and transmission projects will simply not be delivered on time, particularly over the next decade, because of supply chain constraints and social licence issues. These outcomes would then provide a strong signal that coal-fired generation will need to be maintained for longer than assumed or modelled by AEMO for system security and reliability of the NEM – but the draft 2024 ISP does not even consider this option.

An example of an expectation that will not be met is AEMO's assumed zero coal generation date. In the:

- 2022 ISP it was set at 2042-43; and
- 2024 draft ISP it is set at 2037-38.

It is clear that the bringing forward of the assumed zero coal generation date is because the power system has not reduced emissions over the past few years as fast as is needed to meet the emission targets hard wired into the ISP. This highlights there are risks with AEMO's plan that are not sufficiently drawn out in the ISP. There is a high prospect that the 2024 ISP could drive imprudent investment decisions, for example:

- too much investment in new generation that is constrained until new transmission is built; and
- too little investment in thermal assets that are needed longer than the ISP intends, to keep the power system secure and reliable.



This would then unnecessarily drive-up costs and increase electricity bills for customers.

Delta considers it prudent and necessary for AEMO to highlight where the ISP sits in terms of a more realistic development path. Without clearer signals of the investment still needed in thermal assets, the market will continue to see intervention by governments. This is most notable through the recent release of the NSW Government's consultation paper on the Orderly Exit Management Framework (OEMF). The OEMF is proposed to essentially force retiring thermal units, that bring their notice of closure forward, to remain operating for a period of time where a system need is identified and the need cannot be filled otherwise. Delta argues that this framework, while seeking to maintain reliability and system security of the power system, will inevitably result in less efficient outcomes and higher costs passed onto customers. However, if the ISP highlights the continuing need for thermal assets under a more 'likely' development path, this would provide more accurate investment signals that thermal assets are needed until the transmission and renewable generation infrastructure is delivered. This would reduce the likelihood of less efficient outcomes through interventions and importantly, carbon emissions would likely be no higher to what will eventuate under the current approach.

The risks with AEMO's "Robust Plan"

Attachment 1¹ reproduces a key table from the draft 2024 ISP on Installed Capacity under the scenarios considered in the document, as well as a slide from an AEMO webinar that shows the differences in Capacity between the 2022 ISP and the current draft 2024 ISP.

The capacity build for both onshore wind and utility-scale solar through to 2030 appears to be unrealistically high; AEMO states that triple the current capacity of grid-scale renewable energy would need to be built by 2030 and that about 6 GW of capacity would need to be added each year compared to the current rate of about 4 GW. In contrast, AEMO Services has adopted a NEM wide annual build limit for new generation and storage through to 2029-30 of 4 GW in its 2023 Infrastructure Investments Objectives Report to the NSW Consumer Trustee under the NSW Government Infrastructure Plan. This same limit is adopted in AEMO's supply chain constraints sensitivity; see below.

The following significant changes between the 2022 ISP and the current draft ISP contain a number of inherent risks:

- The significant level of capacity in 2050 assumed to be delivered by Distributed PV at 31% of capacity under the draft 2024 ISP versus 24% of capacity under the 2022 ISP and the associated massive - 32% - increase in Distributed Solar PV capacity in 2050 under the draft 2024 ISP versus the 2022 ISP. Increased household solar makes the operation of the NEM far more volatile and, therefore, increases inherent risks - and the risks would be greatest coming into the evening peak period. The comment below on CER storage is significant in this context as it is quite clear that AEMO is assuming that this co-ordinated CER (consumer-owned) storage will contribute significantly to meet this peak demand (plus additional gas fired generation capacity) - and, at the moment coal-fired generation is the key capacity relied on to cover demand coming into and during peak periods.

¹ AEMO draft 2024 ISP; Appendix 2, Page 14.



- Co-ordinated CER storage is put at up to 65% of the NEM's energy surge capacity by 2050 - but there is no certainty this level of co-ordinated capacity would be properly integrated into the grid (even if was theoretically available).
- The far higher level of gas capacity (from 9.4 GW in the draft 2022 ISP and 16.7 GW under the latest draft) - but as acknowledged in the draft 2024 ISP, this will inevitably increase risks as to the availability of gas to meet this additional demand.

These risks are then exacerbated by the well-known risks created by the uncertainties with a system with ever increasing levels of renewables. These uncertainties are inherent with a weather-dependent system and where it is still unknown if the technology and skills will be available to manage the future grid.

In addition, there are a number of risks that AEMO itself has identified, particularly: supply chain constraints, cost pressures, social licence issues and shortages of skilled labour. AEMO does not fully quantify the impact of all the various risks it has identified and does not assess the compounding impacts of its identified risks as it only considers each risk individually. In expanding on its sensitivity analysis for some of the risks it has identified, AEMO stated that:

- Under its supply chain constraint sensitivity, the Federal Government's 82% 2030 renewable energy target would not be met, with an outcome of only around 62% being achieved.
- Under its reduced social licence sensitivity, project lead times for all transmission augmentation options would be pushed out by two years and project costs would increase by 15%.

The very significant impact of the Supply Chain Constraint through to 2030-31 is shown in the chart presented in Attachment 2.²;

The impact of supply chain constraints is also highlighted in AEMO's 2023 System Strength report:³

"...investment in major network assets is subject to global supply chain issues, economic or geopolitical uncertainty, and competition against the currently heightened international demand for electricity infrastructure. Industry is reporting that the lead time for large synchronous condensers could now be more than five years, making them unavailable to support growing security needs until at least 2028-29".

Conclusion

The draft 2024 ISP sets out a "robust plan" that is inherently risky – with only some of those risks being fully identified and quantified. AEMO's sensitivity analysis highlights the risk that the level of grid-scale renewables envisaged under its plan by 2030 will not be met. If system security and reliability is to be maintained in the face of this "shortfall" in replacement renewable generation and storage, coal-fired generation will necessarily need to stay in operation for longer than AEMO is projecting. But AEMO does not adequately acknowledge this, with the result that it is failing to send correct investment signals in terms of maintaining

² AEMO draft 2024 ISP; Appendix 2, page 59.

³ AEMO's 2023 System Strength report; page 5.



coal generation assets necessary for delivering a smooth, and more efficient, transition in the NEM. This, in turn, increases the prospect that greater government intervention will be required to keep coal fired generation in place to ensure system security and reliability is maintained, with increased costs to taxpayers and consumers.

To discuss further please contact me at joel.aulbury@de.com.au.

Yours sincerely,

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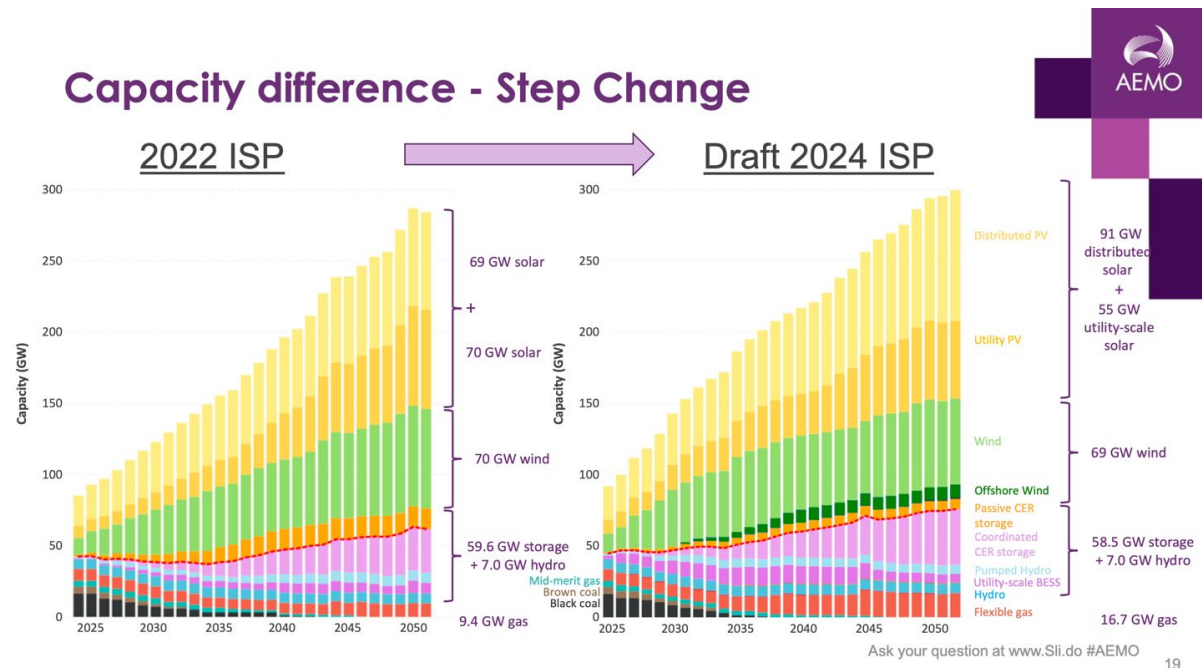
ATTACHMENT 1

Table 1 Installed capacity (GW) in 2023-24, 2029-30, 2039-40, and 2049-50 by scenario

Technology	Actual ^A	Step Change			Progressive Change			Green Energy Exports		
	2023-24	2029-30	2039-40	2049-50	2029-30	2039-40	2049-50	2029-30	2039-40	2049-50
Black coal	16.4	8.7	0	0	7.3	3.1	1.7	4.6	0	0
Brown coal	4.8	2.8	0	0	3.4	0.6	0	1.1	0	0
Mid-merit gas	4.3	3.1	1.5	0.2	2.6	1.5	0.2	3.1	1.5	0.2
Mid-merit gas with carbon capture and storage	0	0	0	0	0	0	0	0	0	0
Flexible gas	7.2	8.7	14.8	17.1	8.7	9.3	10.9	8.8	15.1	17
Hydro	6.8	7.2	7.1	7.1	7.2	7.1	7.1	7.2	7.1	7.1
Utility-scale storage	2.2	12.7	18.6	12.9	14.2	20.2	17.0	17.3	25.5	22.9
Coordinated CER storage	0.1	3.7	18.1	37.3	0.2	1.4	4.1	4.5	22.9	44.4
Passive CER storage	0.6	2.8	6.4	6.8	1.5	2.8	4.0	3.7	8.0	8.8
Offshore wind	0	0	9.0	9.0	0	9.0	9.0	0	9.0	9.1
Onshore wind	10.4	39.6	52.0	61.4	32.0	33.3	43.6	66.5	101.2	145.0
Utility-scale solar	8.4	17.4	29.4	55.5	16.4	18.8	33.5	31.2	68.7	212.6
Distributed PV	21.3	36.1	60.2	85.7	27.7	36.3	42.3	40.8	70.1	98.6
DSP	0.9	1.6	2.5	2.9	1.4	1.8	1.9	2.0	3.7	5.0

A. Based on October 2023 Generation Information update, at <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information>

Source: Draft 2024 ISP Appendix 2, Page 14

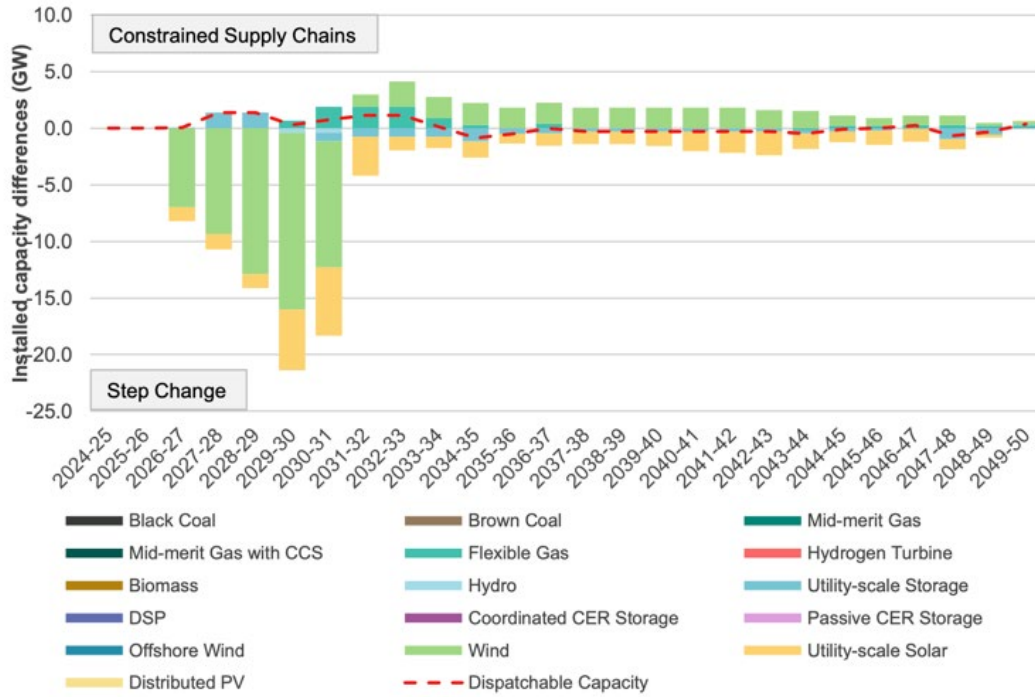


Source: Draft 2024 ISP AEMO Webinar, December 2023



ATTACHMENT 2

Figure 45 Forecast capacity developments to 2049-50 under the *Constrained Supply Chains* sensitivity compared to *Step Change* (GW)



Source: Draft 2024 ISP Appendix 2, page 59