

Delta Electricity's Response to AEMO's Draft 2022 Integrated Service Plan

Delta Electricity (Delta) welcomes the opportunity to provide feedback on the Australian Energy Market Operator's (AEMO) draft 2022 ISP. Delta acknowledges the extensive work undertaken by AEMO in drafting the ISP, but considers there are several shortcomings in the modelling approach that need to be addressed to ensure the final ISP provides the best possible representation of future market scenarios to help ensure that future investment decisions based on the 2022 ISP are consistent with the National Electricity Objective.

A significant feature of the draft 2022 ISP is the adoption of the Step Change scenario (versus the Progressive Change scenario) as the most likely future scenario. The Step Change scenario includes a far more rapid pace of closure of coal fired power stations than what has been advised by generators. The signalling of potential early closures of coal fired power stations has significant consequences for market participants, consumers and government should the forecast prove to be wrong.

The aspects of the draft ISP's development approach that warrant review include:

1. the veracity of the Revenue Adequacy Model, that AEMO uses for undertaking analysis of potential early closures of coal fired generators, requires examination as AEMO itself acknowledges deficiencies with this Model. In particular, there is no recognition of the role the hedge contract market plays in securing revenue, regardless of spot market prices, and, therefore, whether this could help ensure that coal fired generators would be able to operate through to their currently scheduled closure dates;
2. as noted by the AER, AEMO has not paid sufficient regard to the prospect of coal fired generators being able to operate more flexibly and, therefore, whether this could help ensure that these generators are able to operate through to their currently scheduled closure dates;
3. the steps adopted through its Delphi process appear to have given insufficient attention to the key issue of the system security implications of the earlier closure of coal fired generators under the Progressive Change and Step Change scenarios and, therefore, whether these scenarios should have been given the strong levels of support they received through the Delphi process – with this then warranting a review of the Delphi process; and
4. there is no acknowledgment that power system security and reliability requirements could materially impact the projected optimal development path and that some large



synchronous generating plant may need to remain operational past modelled closure dates to ensure the power system remains secure.

These issues are critical to all stakeholders as the “pronouncements” and “forecasts” generated through the ISP process drive decisions and responses by NEM participants, a range of investors generally, TNSPs, Governments (Federal and State) and consumers. That is, AEMO’s ISP is a primary driver for key investment decisions, and it is therefore critical that its findings are derived from rigorous analysis and modelling that fully represents the behaviour of coal fired generators.

Delta’s concern is that if the modelled ISP outcomes and conclusions are not based on the best available input assumptions, there is a very high risk that these outcomes and conclusions could drive imprudent investment decisions by stakeholders (especially TNSPs or new generation capacity underwritten by government). This will unnecessarily drive-up costs of the power system and increase consumer electricity bills. In particular, regulated transmission investment is very long lived and over-investment will unnecessarily burden consumers for many decades.

An example of the influence the ISP may have on potential investment in new generation capacity can be found in the Energy Security Board’s Capacity Mechanism Project initiation paper which references the draft ISP as “forecasting” coal generation exits.¹ Accepting such a forecast of early closure of coal plant as likely will directly influence the ESB’s thinking on the nature and timing of a capacity mechanism which could see consumers directly contributing to the cost of additional capacity that may not be needed until a much later date. Such an outcome would be inconsistent with the National Electricity Objective, which is “to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity...”.

Delta therefore strongly recommends that:

1. the AER undertake a review of AEMO’s Revenue Adequacy Model to determine if it meets the requirements of its Forecasting Best Practice Guidelines, with particular reference to whether the outcomes presented in the draft 2022 ISP concerning early exit of coal fired generators is in line with the requirement in the guidelines that “forecasts should be as accurate as possible, based on comprehensive information”;
2. the full details of AEMO’s Revenue Adequacy Model and detail on all of the inputs run through this model for each of the 2022 ISP scenarios be made available to stakeholders for their own review and analysis to allow additional input into the 2022 ISP;
3. AEMO ensure that all of its statements concerning early coal closures highlight, in a consistent manner, any deficiencies or limitations in the modelling that produced the relevant coal closure conclusions or forecasts;
4. given the inaugural use of the Delphi process in the draft 2022 ISP processes and the significance of that process in determining the weightings and “most likely” status of the ISP’s scenarios, an independent review should be undertaken of the Delphi

¹ ESB, Capacity Mechanism initiation paper, p. 4



process, including the selection of panel members, the level of detail provided on each scenarios and the questionnaire provided to panel members, as well as whether the process could be made more transparent; and

5. given the significant risks on system security and reliability highlighted by AEMO itself as to the impact of the Step Change and Progressive Change scenarios (with their more rapid closures of coal fired (synchronous) generators), AEMO include, consistent with the AER's Cost Benefit Analysis Guidelines, a detailed analysis in the final 2022 ISP based on the adoption of a "Risk Averse" position, in addition to its current approach of only using a "Risk Neutral" approach.

In relation to dot point 5, Delta notes the work by AEMO on its Engineering Framework to determine the operational, technical and engineering requirements for a secure power system as technologies and generation sources change. Delta has long advocated for a much clearer picture of the limits of intermittent non-synchronous generation in an evolving, and stand-alone, power system. An optimal development path cannot be considered without the overlay of the technical requirements of power system operations versus the current approach of effectively assuming that system security issues will be largely addressed through the deployment of synchronous condensers (although it is also noted that this assumption by AEMO is essentially a cost accounting assumption). Accordingly, it would be prudent to delay the publication of a final ISP until the engineering framework has confirmed it is technically and economically feasible for the power system to operate at the very high levels of instantaneous non-synchronous generation over the medium term under the Step Change scenario.

The Attachments outline Delta's consideration of the Draft 2022 ISP in further detail:

- Attachment 1 - Revenue Adequacy Model.
- Attachment 2 - Operational Flexibility of Coal Fired Generators.
- Attachment 3 - System Security and Other Risk Factors.
- Attachment 4 - Delta's Response to Questions for Stakeholders.

Yours sincerely

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ATTACHMENT 1

Revenue Adequacy Model

The Revenue Adequacy Model is a critical determinant of ISP outcomes concerning the closure of coal fired generators, with these “outcomes” then being a major driver of other key ISP conclusions. The very significant bringing forward of the closure dates of coal fired generators under this latest ISP analysis versus the 2020 ISP warrants far greater scrutiny of the model.

Given the limitations of the Revenue Adequacy Model, as acknowledged by AEMO, it would appear that there is an over-reliance on this model in the draft 2022 ISP and the outcomes in the Progressive Change and Step Change scenarios on the critical issue of early closures of coal fired generators.

In AEMO’s 2021 ISP Methodology,² it writes (emphasis added):

The determination of generator retirements (outlined in Section 2.4.1) is based on projected wholesale net revenue from the bidding model. This provides the best estimate of the financial viability of each generator within the limits of the information available to AEMO.

*AEMO acknowledges that the approach simplifies the complex array of considerations which are taken into account for any individual station’s retirement, including areas such as **contracting positions**, fuel supply arrangements, and portfolio value. **As these considerations are difficult to quantify and are often opaque, AEMO is not in a position to incorporate this level of detail, but does consider the potential for strategies such as seasonal decommitment.***

It is also noted that the issue concerning how the Revenue Adequacy Model did not consider forward contracting (and hedging) was raised by AGL during the consultation on the ISP Methodology in 2021, with AEMO providing the following response (emphasis added) in its ISP Methodology – Consultation Summary Report:³

“AEMO acknowledges that complex dynamics and interactions such as forward contracting and hedging affect market operation and development. However, it is not possible or feasible to include many of these impacts in ISP modelling, due to their complexity, the availability of assumptions, or the ability to apply a systematic approach for their inclusion. AEMO uses forecast wholesale market outcomes as a means for approximating the overall financial outcomes for generators.
“

However, Delta notes that AEMO’s July 2020 Market Modelling Methodologies report presented a number of generator models which included consideration of contract position, for example:⁴

² See section 3.3.3 of AEMO’s ISP Methodology [here](#).

³ See page 21 of AEMO’s ISP Methodology – Consultation Summary Report [here](#).

⁴ See pages 27-28 of AEMO’s 2020 July Market Modelling Methodologies report [here](#).



- Bidding behaviour model – this model uses historical analysis of actual bidding data and back-cast approaches for the purposes of calibrating generator bids, rather than costs, that determine the generator dispatch outcomes. The historical bidding analysis **captures current market dynamics such as contract and retail positions** of portfolios by ensuring that modelled generator bids broadly replicate dispatch preferences of generators and portfolios submitted in each generator’s actual historical bids. Portfolio outage management (by adjusting bids at times of generator outages to maintain portfolio positions) is considered for some large generation portfolios. In the short term these dynamics are assumed to stay relatively unchanged, however the evolution in the energy mix in the medium to long term may reduce the accuracy of this approach beyond the next decade; and
- Nash-Cournot model – used to study the modelled generators’ production by dynamically changing generators bids such that their profit is maximised, given **assumptions regarding costs and contract positions**. The modelled generator may sacrifice cleared generation volumes in exchange for price increases and higher revenue if in so doing it increases the resulting price received and therefore maximises profit.

Hedge contracting is an important consideration in terms of the behaviour of coal fired generators and their revenue position and, therefore, is particularly relevant to a Revenue Adequacy Model. That is, the deficiency acknowledged by AEMO in the model used to determine early coal closures is significant given the importance of contract positions in the behaviour of generators and would appear one that AEMO could correct by more detailed engagement with coal fired generators.

Standard market modelling determines generation dispatch and spot price projections using assumptions on short run marginal costs (SRMC). For thermal plant this will primarily be coal or gas prices estimates. This approach is reasonable and largely reflects the bidding behaviour of thermal plant that seeks to optimise gross margin in real time by minimising generation when the spot price is below their SRMC. However, generators are incentivised to offer prices in the contract market at values at or above their average costs to avoid locking in future losses. This can lead to an outcome where contracts may hold up at prices above the modelled spot prices and therefore sustain the generation for longer than suggested by the Resource Adequacy Model. Whilst projecting contract prices beyond the ASX electricity trading horizon (currently Calendar year 2025) is challenging, some inferences can be made in relation to medium term contract price premiums over spot by comparing contract prices to independent spot price models.

Delta considers that AEMO’s approach is not consistent with the AER’s Forecasting Best Practice Guidelines and believes the AER should undertake a review of, and publicly report on, the adequacy of the Revenue Adequacy Model ahead of AEMO completing the 2022 ISP.⁵

Delta also notes the AER’s Forecasting Best Practice Guidelines require AEMO to have regard to several principles, including: “stakeholders should have as much opportunity to engage as is practicable, through effective consultation and access to documents and information” Given the significance of AEMO’s Revenue Adequacy Model in “forecasting” early coal closures which, in turn, drive key outcomes in the Step Change and Progressive Change scenarios,

⁵ The AER’s forecasting guidelines require AEMO to have regard to a number of principles, including: “forecasts should be as accurate as possible, based on comprehensive information”.



Delta submits that the full model should be released to stakeholders, and that AEMO should detail all of the inputs run through this model for the 2022 ISP.

ATTACHMENT 2

Operational Flexibility of Coal Fired Generators

In the AER's Review Report on the draft 2022 ISP⁶, it referenced AEMO's Revenue Adequacy Model and raised a number of questions as to the approach AEMO had taken towards the ability of coal fired generators to operate more flexibly and how a greater ability to operate flexibly could affect the timing of coal fired generator retirements. In particular, the AER's assessment noted a number of inadequacies in AEMO explanations, and expects AEMO to provide further explanations to the following requests:

- *How it has derived the assumptions and inputs regarding the profitability of coal plant and how this has contributed to modelled coal plant retirements across each scenario.*
- *How it has derived the inputs and assumptions used to support the conclusion that 'seasonal mothballing' of coal plant will not extend the life of this plant in the Progressive Change scenario.*
- *The reasons why intra-day coal plant flexibility has not been modelled. AEMO must also undertake further consultation on these issues.*

The AER also states AEMO must undertake further consultation on these issues.

Delta endorses the AER's position and looks forward to further engagement and more detailed explanations to be provided by AEMO.

Delta also notes the following statement in the ISP Methodology in the context of earlier comments on, and concerns with, AEMO's approach to modelling:⁷

"Even with granular time-sequential modelling, the forecasting of coal flexibility is a challenging exercise with significant uncertainty. It is not tractable to forecast any optimisation of this behaviour within the capacity outlook modelling and therefore some assumptions need to be made".

⁶ Available on the AER's website [here](#).

⁷ See page 31 of AEMO's ISP Methodology [here](#).

ATTACHMENT 3

System Security and Other Risk Factors

Consideration needs to be given to the power system reliability and security challenges that would likely arise if AEMO's risk-neutral scenario and the "forecast" of early coal fired generator closures was adopted by various stakeholders and, thus, drove both Government policy outcomes and investment decisions.

Delta highlights the following commentary in the ISP and its appendices (emphasis added):

- AEMO draft 2022 ISP states "This transformation poses **significant operability challenges** to retain the levels of reliability and security that consumers rightly expect from their power system".⁸;
- Appendix 4 states "**This analysis does not consider the operational challenges of maintaining the security of the grid...**Within operational timeframes, **further consideration must be given on the capacity of the power system to respond to fluctuations in the grid's stability, and the capacity for resources to provide fast frequency response.**"⁹; and
- Appendix 7 states that in terms of system strength mitigation capabilities: "**Procurement of system strength mitigation such as large synchronous condensers** is expected to take at least two years; there is a **risk of being caught out by early generation retirements** or failures, as these are aspects not easily forecast. In some locations, network upgrades may also be required to facilitate integration of synchronous condensers due to (local) increases in fault level. Other technical solutions, such as advanced inverters with grid-forming capabilities at strategic sites in the NEM, have the **potential** to reduce the system's reliance on synchronous plant, enabling further decarbonisation and delivering benefits to consumers. However, **at present this potential is not demonstrated at the necessary scale, and focused engineering development is urgently needed to address the remaining issues and realise the promise of this technology.**"¹⁰

It is also Delta's understanding that the steps adopted through the ISP Delphi process gave insufficient attention to the key issue of the System Security implications of the far earlier closure of coal fired generators under the Progressive Change and Step Change scenarios and, thus, whether these scenarios were realistic in terms of ensuring that Australia continue to have a safe, secure and reliable electricity system.

Additionally, Delta is concerned that AEMO has not paid sufficient regard to the prospect of HumeLink being delayed, even under a staged approach (eg, because of electricity infrastructure market capacity constraints identified by Infrastructure Australia in recent materials and social licence (landowner) issues) and, thus, not meeting AEMO's target delivery date of 2026-27.

Delta notes that, in line with the AER's Cost Benefit Analysis Guidelines,¹¹ AEMO has adopted a risk-neutral approach for the ISP, but points out that the AER's guidelines also allow AEMO

⁸ AEMO's Draft 2022 ISP, p. 44.

⁹ Appendix 4: System operability, p. 11.

¹⁰ Appendix 7: Power system security, p. 13.

¹¹ The AER's Cost benefit analysis guidelines can be accessed [here](#).



to choose a risk-adverse approach, which can be appropriate when the risks are concentrated on a particular group or are large even when shared/spread across a large population.¹²

Given the significant risks to system security and reliability highlighted by AEMO itself as to the impact of the Step Change and Progressive Change scenarios (with their more rapid closures of coal fired (synchronous) generators) and the demonstrated adverse impact of unplanned early coal closures on electricity prices, Delta considers that the AER's Cost Benefit Analysis Guidelines would warrant AEMO also adopting a Risk Averse approach in its 2022 ISP analysis as:

1. any system security and reliability issue will have a material impact on electricity consumers and potentially the economy as a whole; and
2. early coal power generation closures, ahead of the completion of key transmission projects such as HumeLink, could drive higher than necessary electricity prices.

¹² Ibid, p. 29.



ATTACHMENT 4

Deltas Response to Questions for Stakeholders

The table below provides Delta Electricity's response to the stakeholder questions raised throughout the draft IPS document.

Stakeholder questions	Delta Electricity's response
Do you consider that the Draft ODP [Optimal Development Plan] appropriately reflects the consumer risk preferences? Is the reasoning for the Draft ODP clear? Are there any other risks that should be quantified?	As detailed above, Delta's concern is that the ODP includes risks that have not been sufficiently considered. These are outlined in the sections above.
Is the proposed staging for HumeLink and VNI West, with early works as the first stage and then proceeding to implementation subject to conditions, appropriate?	As detailed above, Delta's concern is that the modelled ISP outcomes and conclusions are based on deficient inputs. This would mean there is a risk that the staging outcomes for HumeLink and VNI West are not appropriate. Delta considers AEMO should address its concerns outlined above and reassess the proposed staging and outline the associated risks.



Stakeholder questions	Delta Electricity's response
Is the proposed treatment of Marinus Link as a single actionable ISP project appropriate?	Marinus Link is a multi-billion-dollar, long-lived regulated asset that must be rigorously subjected to economic assessment (RIT-T) in a way that minimises risk for consumers. Given the uncertainty that exists in the transition, some of which has been outlined above, there is a material risk that the net benefits of Marinus Link won't be fully realised if it is treated as a single actionable project. This risk is reduced if the project is considered as two separate investments, where the timing of the second stage can be more efficiently implemented. This will improve the likelihood of customers only pay for investments when they are actually needed/providing benefits.
Do you consider that REZ Design Reports are warranted for the indicated REZs?	Yes. Much of the REZ investments will be through new/augmented networks, with costs directly recovered from electricity consumers. Any poor or inefficient decisions made in this space will be borne by customers. Therefore, any further work (such as REZ Design Reports) that improve the outcomes and timing of these investments will improve the delivery of and maximise the benefits to the market and customers.
Do you have any feedback on the Addendum to the 2021 Inputs, Assumptions and Scenarios Report?	The Power System Security report clearly states that there are shortfalls and gaps in system strength, inertia and NSCAS under the ISP step jump scenario over the next 5 years. The report goes further and states that "Urgent action and alignment is required". It is unclear as to whether or not the shortfalls and gaps can be remedied in time. This is an important question that needs to be answered in the affirmative otherwise the OPD will need to change.