# ISP 2022 Consumer Panel

## ISP Consumer Panel Report on AEMO's *Draft 2022 Integrated System Plan*

As required by Section 5.22.7 of the National Electricity Rules

10 February 2022

## Contents




The Consumer Panel can be contacted via ISPConsumerPanel@aemo.com.au.

## Cover Letter

**Daniel Westerman**
Chief Executive Officer, AEMO

Dear Daniel,

On behalf of the ISP Consumer Panel, please accept our Report on the Draft 2022 ISP.

We would like to acknowledge the enormous complexity of the ISP process and the dedication of those involved in its development.

We would particularly like to acknowledge Alex Wonhas for his enormous contribution to this and previous ISPs and thank Nicola Falcon for her leadership and willingness to listen. There are many others in the AEMO teams that deserve recognition but for fear of missing someone out we won't try to list them all. One person deserving special mention though – for his patience and endurance since we were established in November 2020 - is Oliver Derum from AEMO's Stakeholder Relations Team.

This Report concludes our formal obligations under the National Electricity Rules and we thank you and AEMO for the privilege of being the inaugural ISP Consumer Panel.

We have arrived at a view that the most useful role for the Panel is partnering with AEMO to help consumer stakeholders understand the risks being managed by the ISP and then to help them express their preferences in how they are managed.

We remain willing and able to support AEMO's engagements as you finalise the 2022 ISP and plan your stakeholder engagement approach for the 2024 ISP.

Sincerely,

Dr Andrew Nance (Chair), Stephanie Bashir, Gavin Dufty, Mark Grenning, Richard Owens

10 February 2022

# Executive Summary

## Background and scope

The ISP Consumer Panel (the Panel) was established under the National Electricity Rules in November 2020 as part of the oversight framework that accompanied the introduction of the Integrated System Plan (ISP). We are five energy professionals with long histories in consumer issues and the National Electricity Market (NEM).[1] This report is in response to requirements under the National Electricity Rules for us to report on AEMO's Draft 2022 ISP,[2] and has been informed by our ongoing engagement with AEMO and stakeholders.

## Our Approach

At the outset, the Panel would like to acknowledge the complexity of the ISP process and the dedication of those involved in its development.

To be clear, we strongly agree that meeting the National Electricity Objective of the long-term interests of consumers during such a period of transition requires a 'whole of system plan' that looks ahead 20+ years. AEMO's ISP is that plan, and our aim is for an ISP that electricity consumers and other stakeholders can have confidence in.

Decarbonisation and decentralisation are quickening, and we want consumers to be confident the ISP's "optimal development path" (ODP) appropriately balances the risks of under-investment or over-investment in the power system as we make the transition. Either way, if we get it wrong, consumers will pay more than they need to for electricity, and we know the affordability of electricity is already a major issue for many consumers.

In relation to the ISP, we have interpreted the National Electricity Objective (the pursuit of the long term interests of electricity consumers) as occurring when the ISP process plans and initiates prudent and efficient investments in the capacity of the electricity system in order to best meet the future needs of consumers at an efficient cost. We are conscious that these projects have long lead times and the 'optimal' need for them depends on a large range of influences with significant **uncertainties**.

---

1 For more information about the Consumer Panel see https://www.aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel. We are paid by AEMO from funding it receives for the role of National Transmission Planner. In turn, this funding comes from consumers as regulated charges. So, like Energy Consumers Australia, we are funded by consumers to promote the consumer interest. More information is provided in Appendix A.

2 Published by AEMO on 10 December 2021 here: https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp

The Australian and International Standard for Risk Management[3] defines **risk** as the: 'Effect of **uncertainty** on **objectives'** and characterises the purpose of risk management as 'the creation and protection of value – it improves performance, encourages innovation and supports the achievement of objectives'.

If we consider the NEO as the 'objective' then we can see the ISP as providing risk management for the long term interests of consumers. In fact, the rules require the AER's CBA Guidelines (and hence the ISP) to recognise the **risks** to consumers arising from **uncertainty**, including over-investment, under-investment, premature or overdue investment.

- If there is over-investment or premature investment (paying too much for the capacity added to the shared network, building too soon or in the wrong place), this expenditure will add to the regulatory asset bases of transmission businesses and consumers will pay more than necessary,
- If there is under-investment or overdue investment (not adding capacity to the shared network in the right places, soon enough), there will also be higher costs to consumers from not being able to share as much generation capacity, an increased risk of power outages due to reduced security of supply, or failure to meet emissions reduction targets due to an inability to connect new renewable generation as the existing generation fleet retires.

The Draft ISP, very appropriately, refers to risks and uncertainties, but any risk-based approach to planning in the consumer interest must inevitably – explicitly or implicitly – makes assumptions about the **risk appetite** of consumers.

We congratulate AEMO for asking specifically for feedback on this very topic ODP, where the Draft ISP asks:[4]

- Do you consider that the Draft ODP appropriately reflects the consumer risk preferences? Is the reasoning for the ODP clear? Are there any other risks that should be quantified?

However, having grappled to respond to these very questions ourselves, we suspect this important but elusive concept will only be revealed through structured enquiry. We have observed a diversity of **risk preferences** amongst ourselves, consumers and other stakeholders based on circumstances and priorities.

---

3 AS ISO 31000:2018 Risk management – Guidelines

4 Draft ISP, p16

Further, based on our experience to date, consumers do not have much experience in articulating their preferences nor do they have access to or familiarity with the sort of risk assessment tools necessary to form a view on the complex balance of risks between over and under investment.

As a result, the Draft ISP has necessarily made assumptions about the appetite for consumers to invest in the shared network.

These are assumptions that could and should be made more robust through targeted engagement with consumer stakeholders. We see this as a significant **opportunity** to improve the ISP process.

### Findings and Recommendations

Based on our experience so far, AEMO's approach to the 2022 ISP reflects considerable improvements on the 2020 ISP from both a *process* (e.g. stakeholder engagement) and *content* (e.g. robustness of the scenarios and assumptions) perspective. Nevertheless, there is still considerable scope for further improvement in both.

The rules require that we set out in this report our *'assessment of the evidence and reasons supporting the Draft ISP'* having regard to the long term interests of consumers.[5] The Panel considers that to achieve the long term interests of consumers, the ODP must represent a transparent balance of the most material risks – managed in a way that is consistent with the risk appetite of consumers.[6] In essence, we have assessed whether the evidence and reasons would support us saying "*the Draft ISP's ODP represents an appropriate balance of the most material risks to consumers*."

Our overall assessment of the Draft ISP is that it currently **lacks sufficient evidence and reasons for assumptions made of consumer risk preferences**. We are conscious that these projects have long lead times and the 'optimal' need for them depends on a large range of influences with significant **uncertainties.** For the Panel to objectively determine whether the risk of under-investment is greater or less than the risks of over-investment would also require assumptions around the risk appetite of consumers – we are not a substitute for engaging directly with . The Panel fully supports a risk management approach to the pursuit of the consumer interest and we recommend AEMO support consumer stakeholders to engage in targeted risk assessments on key consumer topics prior to the publication of the Final ISP.

---

5 NER clause 5.22.7(e)

6 The risk appetite of consumers is an elusive but important concept. It is not homogenous between consumers and not constant over time. It tends to be context specific and seems more likely to be revealed through structured inquiry around preferences for different options.

The rules also require us to advise on whether the report is delivered by **consensus**. We can advise that it was necessary to – eventually – explicitly adopt a risk management approach so that we could separate our views on the way AEMO has set out the risk analysis, from expressing our individual views on whether or not the ODP investments matched our own risk appetites. As a result, we can advise that this report presents a consensus view on AEMO's approach to Risk Analysis. However, to be clear, there is no consensus from the Panel on how well the ODP meets our individual risk preferences. Nor does the Panel think there needs to be – it is not our role to be a substitute for the views of consumer stakeholders – but this does highlight the primary gap in the evidence and reasons provided by AEMO.

The CBA Guidelines state that when selecting an optimal development path, AEMO is required to:[7]

> *Use professional judgement in balancing the outcomes of the above decision making approaches … and explaining … why the level of risk neutrality or risk aversion chosen is* ***a reasonable reflection of consumers' level of risk neutrality or risk aversion****.*

In several critical areas, AEMO has used its discretion and judgement to determine an approach to managing risk that it considers aligns with consumers' risk preferences without explicitly stating the evidence for that conclusion, e.g. whether AEMO has had any discussions with consumers on how those risks should be managed and allocated.

The ISP framework provides a number of 'risk management tools' that AEMO can deploy during the 2-yearly ISP cycle that seek to reduce uncertainty by obtaining better information to improve decisions in future ISPs. These include early works, decision rules, preparatory activities and REZ design reports.

In relation to the proposed ODP, we recommend targeted engagement on the early works and decisions rules for HumeLink and VNI West. AEMO's decisions on these projects are partly driven by an intent to provide an option to consumers if coal closure is quicker than the scenario weighted modelling suggests. However, proposals to spend a total of $821m to meet 'consumer risk preferences' warrant more structured enquiry.

It is also clear to us that many of the risks the ISP is tasked with managing can be traced to uncertainties that are 'externalities' to the electricity market and consumers' energy choices. This leaves consumers carrying 'investment risks' that they are unable to effectively or efficiently manage. The Australian Energy Market Commission's principles when applying the NEO to rule changes and reviews includes "*Risks should be allocated to those best placed to manage*

---

[7] AER, CBA Guidelines, p27

*them*" and "*… should lead to mitigation of risk and incentives to improve risk management over time*".[8] The Draft ISP appropriately refers to opportunities for 'third party funding' to assist with allocating some risks to parties other than consumers and create stronger incentives improve risk management over time. We encourage AEMO to maintain a leadership position on the need to efficiently allocate responsibility for the "external" risks identified in the ISP.

### Report structure

- Section 1 of this report introduces the ISP, the Consumer Panel and our approach to the long term interests of consumers.
- Section 2 explains why we see the ISP as a Risk Assessment for consumers. We discuss our views on the key sources of uncertainty being managed by the ISP and how they can result in under or over investment in the power system.
- Section 3 sets out our consideration of AEMO's evidence and reasons for the proposed Optimal Development Path and makes recommendations regarding balancing the risks of over and under investment.
- Section 4 summarises our recommended engagement priorities for the period between now and publishing the Final 2022 ISP and recommendations regarding building a community of practice of engaged consumer stakeholders.
- Section 5 builds on the preceding sections to provide a brief discussion of AEMO's obligations to report on Distributional impacts in the final ISP and how this can help stakeholders understand and express their risk preferences.

[8] Available from www.aemc.gov.au/regulation/regulation

## Summary of recommendations

This table summarises our recommendations and where each is discussed in this report. These recommendations build on the earlier recommendations (grouped A to D) set out in our September 2021 report on the ISP Inputs Assumptions and Scenarios report[9], which AEMO is in the process of implementing (See Draft 2022 ISP Appendix 1). Ideally AEMO would implement all the recommendations in Group E below for the 2022 Final ISP, but there is unlikely to be sufficient time to do so. Given time constraints, AEMO should focus on Recommendation E1 as well as how consumer risk preferences can inform its decisions on the optimal timing and staging of VNI West and HumeLink. Those recommendations are presented below as Group F.

| ID | Headline | Description | Where to find out more |
|---|---|---|---|
| **E: Develop processes to understand consumer risk preferences and use those preferences to inform how risks are managed in the ISP** | | | |
| **E1** | **Acknowledge First Nations** | The Panel acknowledges the many First Nations that host Australia's electricity grids and pay respect to Elders past, present and emerging. We are conscious of the landscape-scale impacts of the energy transition and wish to emphasise the importance of engaging further with traditional owners as the grid seeks to expand. In recognition of this we encourage AEMO to include overlaid maps of the Transmission Networks and Renewable Energy Zones with the AIATSIS Map of Indigenous Australia[10] in the Final ISP as one step on a longer walk. | Section 4.2 |
| **E2** | **Transparently explain the key risks and judgements involved in the ISP** | AEMO should clearly explain in the ISP the key risks to consumers of under or over-investment, how those risks are impacted under different candidate development paths (CDPs), how AEMO has exercised its judgement that the optimal development path (ODP) best manages those risks and why AEMO considers those decisions to be consistent with consumers' risk preferences. | Sections 2.1 and 3 |

9 Available at https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel

10 https://aiatsis.gov.au/explore/map-indigenous-australia

| ID | Headline | Description | Where to find out more |
|---|---|---|---|
| **E3** | **Undertake targeted engagement to understand consumer risk preferences** | AEMO should undertake targeted engagement with consumer stakeholders on their risk preferences in relation to ISP investments. This engagement should focus on specific tangible issues where AEMO needs to exercise judgement in how the risks to consumers of under or over-investment are managed, particularly where different CDPs have similar net market benefits but different impacts on the risks to consumers arising from uncertainty. | Sections 2.1 and 3 |
| **E4** | **Use consumer preferences to inform how risk is managed** | AEMO's decisions on the ODP and the ISP's risk management toolkit (e.g. option value, early works, preparatory activities, REZ Design reports) should be informed by the outcomes of AEMO's engagement with consumers on risk preferences. AEMO should transparently explain how it has taken these risk preferences into account. | Section 3 |
| **E5** | **Understand differences between government and consumer risk preferences** | AEMO should consult with governments to understand their risk preferences in relation to under and over-investment and the timing of potential actionable projects. Where governments' risk preferences diverge from consumers' risk preferences, AEMO and governments should consider the appropriate role of government funding to reduce the risks borne by consumers. | Section 3.6.5 |
| **E6** | **Explain distributional impacts** | Consistent with the AER's CBA Guidelines, the ISP should explain the key distributional impacts of the ODP. These impacts should not drive decisions on the ODP, but are useful to inform stakeholders form their risk preferences and develop ways of expressing them. For the 2022 Final ISP, AEMO should include analysis of the impacts on different types of customers, including by state/territory, by customer size and type (eg residential, small business and large customers), inter-generational impacts and the incidence of costs and benefits between electricity consumers and Hydrogen exporters. | Section 5 and Section 3.4 |

| ID | Headline | Description | Where to find out more |
|---|---|---|---|
| **F: Provide more information and engage with consumers on staging decisions for VNI West and HumeLink for the 2022 Final ISP** | | | |
| **F1** | **Focus on how consumer preferences can inform staging decisions for VNI West and HumeLink** | Given time constraints, AEMO should focus on how consumer risk preferences can inform its decisions on the optimal timing and staging of VNI West and HumeLink. AEMO states that its decision to make VNI West and HumeLink actionable with staging 'best align with consumer risk preferences', but there is no evidence AEMO has consulted with consumers on their preferences. AEMO should undertake a targeted consultation process with consumers to understand their risk preferences and how they can inform the decisions on these two projects for the 2022 Final ISP. | Sections 3.6.1, 3.6.2 and 4.3 |
| **F2** | **Provide more detailed explanations of the scope and costs of early works** | We support the concept of early works and its use for VNI West and HumeLink, but more detailed explanations of the scope of the works and more comprehensive cost estimates are needed to be confident that the scope of these works is appropriate and they deliver value to consumers. | Section 3.6.2 |
| **F3** | **Develop more specific decision rules** | The decision rules for proceeding to stage 2 of VNI West and HumeLink should be clearer and more specific. In particular, the decision rules should enable consumers to have a clear understanding of the level of residual risk they are bearing after the early works expenditure. | Section 3.6.2 |
| **F4** | **Implications of feedback loop decisions** | AEMO's January 2022 'feedback loop' decision for HumeLink early works appears to mean the approach to early works for HumeLink is now locked-in with no scope for AEMO to make changes based on stakeholder feedback to the Draft ISP. AEMO should clearly explain in the Final 2022 ISP the implications of this decision, and the timeline for the various decision points relevant to all projects potentially involving early works. In future ISP processes, AEMO should undertake thorough consultation on these types of issues *prior to* publication of the Draft ISP or an ISP Update. | Section 3.6.2 |
| **G: Other recommendations for the 2024 ISP process** | | | |
| **G1** | **Delphi Panel process** | AEMO should consider how the Delphi Panel process for determining scenario weights can be improved to better reflect consumer risk preferences and consult closely with the Consumer Panel and other stakeholders on that process. | Section 3.2 |

| ID | Headline | Description | Where to find out more |
|---|---|---|---|
| **G2** | **Use of scenario weights in selecting the ODP** | Recognising that any decision on scenario weights is subjective, AEMO should use a broader range of possible scenario weights and sensitivities to test the robustness of the ODP. | Sections 3.2 and 3.3 |
| **G3** | **Hydrogen Superpower scenario** | AEMO should not place significant weight on the Hydrogen Superpower scenario until AEMO has undertaken further consultation on risk preferences and AEMO and stakeholders are more confident in the robustness of this scenario's inputs, assumptions and likelihood. | Section 3.4 |
| **G4** | **Social licence** | Managing social licence is a key risk to the delivery of the ISP's ODP. AEMO should put more emphasis on this issue – and take a leadership role amongst the many stakeholders that will need to be involved – as it plans the development of the 2024 ISP. The Transmission Cost Database should be extended to explicitly include analysis of likely social licence costs. | Section 3.7 |
| **G5** | **Supply chain risks** | Supply chain risks related to delivering multiple projects at the same time have the potential to be a material risk to the delivery of the ISP's ODP. AEMO should consider how to better assess this risk as part of the development of the 2024 ISP. The Transmission Cost Database should be extended to explicitly include analysis of likely supply chain risks. | Section 3.7 |
| **G6** | **Build a community of practice around the ISP for consumer stakeholders** | The complexity of the ISP development process can make it difficult for consumers to understand and engage in it, and this impacts the ability to build consumer confidence in the findings. AEMO should identify and implement learning and development opportunities to build a community of practice amongst consumer stakeholders who wish to engage in the ISP development process or use information from the ISP to inform other process. | Section 4.3 |

# 1 About the ISP, the Consumer Panel and this Report

## 1.1 The importance of the Integrated System Plan (ISP)

AEMO is responsible for publishing the Integrated System Plan (ISP) for the National Electricity Market (NEM) every two years. The 2022 ISP will be the third ISP from AEMO, and the first that is subject to the full set of consultation and transparency arrangements under the National Electricity Rules (NER)[11].

The Draft 2022 ISP identifies an optimal development path (ODP) for the NEM that includes 'actionable' ISP projects and future ISP projects, which can be progressed through the regulatory investment test for transmission (RIT-T) process or state-based processes. With potential capital expenditure in the order of several 10s of $billions by 2040, the ODP represents a major infrastructure investment program on behalf of current and future consumers – navigating the 'co-optimisation' of transmission, generation and storage to meet consumers' future energy needs.

These investments are based on an assessment of the likely timing, location and scale of demand from consumers contrasted against the likely program of closures from existing generators. Given all of these uncertainties, the ISP is largely about managing risks – adapting to the future as better information becomes available.

As stated in the AER's CBA Guidelines:[12]

> *the ISP provides value in its ability to coordinate transmission network investment across the market, and facilitate efficient power system development in an uncertain future environment. As such, the ISP needs to be able to respond flexibly to changing market conditions that may result in change(s) to its optimal development path by deferring, halting, accelerating, reducing or expanding actionable ISP projects from a previous ISP.*

The ISP operates on a 2-yearly cycle and the ODP has been recommended based on extensive cost-benefit analysis based on various inputs, assumptions and scenarios that have been substantially updated since the 2020 ISP was published.

---

11 A summary of the planning process is available from the AEMC here: https://www.aemc.gov.au/energy-system/electricity/energy-system

12 AER, CBA Guidelines, p38

## 1.2 The role of the ISP Consumer Panel

The 2022 ISP Consumer Panel's role is to provide independent, expert advice and promote the interests of consumers during development of the 2022 ISP. The Panel was set up under changes to the National Electricity Rules put in place since the 2020 ISP. The Panel forms part of the "ISP Oversight Framework" alongside the AER.

Established in November 2020, the Panel consists of five individuals with long and diverse experience in the different facets of the National Electricity Market.[13] The Panel is required to publish two main reports:

- A report on the IASR in September 2021[14]
- This report in February 2022 on the Draft ISP.

AEMO must have regard to the Panel's reports as part of its decision-making, and the Draft ISP and Final ISP must include information about how AEMO has considered the Panel's reports. AEMO explained their response to our IASR Report in Appendix 1 to the Draft 2022 ISP, *Stakeholder Engagement*.

As well as publishing the two reports required under the rules, we engage closely with AEMO through formal and informal submissions and other activities. We have seen our role not only in terms of the 2022 ISP but also in terms of the importance of the ongoing ISP development process as a way for consumers to understand, navigate uncertainty and manage risks during the energy transition.

The Panel members come from quite diverse backgrounds with a range of experiences and this means we bring different perspectives to how we meet the Rules consensus obligation. We hold quite different views on the relative risks of over and under investment and, after considerable debate, we concluded that the best course was to encourage AEMO to more formally engage with consumers of all types on a risk management framework that allows high quality, comprehensive Risk Analysis to be separated out from the tendency to advocate for one's own risk preferences.

The Draft ISP, appropriately, refers to risks and uncertainties but any risk-based approach to planning in the consumer interest must inevitably – explicitly or implicitly – make assumptions about the **risk appetite** of consumers. We have observed a diversity of **risk preferences** amongst

---

13 For more see https://aemo.com.au/newsroom/media-release/aemo-announces-isp-consumer-panel and https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel

14 Available at https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel

ourselves, consumers and other stakeholders based on circumstances and priorities. We see a key role for the Panel as helping consumer stakeholders understand the risks being managed by the ISP and then to help them express their preferences in how they are managed.

### 1.3 The long term interests of consumers in the ISP

The National Electricity Objective is stated in the National Electricity Law as:[15]

> *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:*
>
> - *price, quality, safety and reliability and security of supply of electricity*
> - *the reliability, safety and security of the national electricity system.*

For our role in the ISP oversight framework, we have interpreted the long term interests of consumers as being in relation to the ISP initiating prudent and efficient investments in the capacity of the electricity system in order to best meet the future needs of consumers at a reasonable cost - conscious that these projects have long lead times and the 'optimal' need for them depends on a large range of influences with significant uncertainties.

The Australian and International Standard for Risk Management (AS/NZS ISO 31000:2018) defines **risk** as the: 'Effect of **uncertainty** on **objectives'**. Risk management is about managing threats and opportunities while pursuing these objectives.

If we consider the NEO as this 'objective' then we can see the ISP as providing risk management for the long term interests of consumers. In fact, the rules require the AER's CBA Guidelines to recognise the risks to consumers arising from uncertainty, including over-investment, under-investment, premature or overdue investment.[16]

If there is over-investment or premature investment (paying too much for the capacity added to the shared network, building too soon or in the wrong place), this expenditure will add to the regulatory asset bases of transmission businesses and consumers will pay more than necessary,

If there is under-investment or overdue investment (not adding capacity to the shared network in the right places, soon enough), there will also be higher costs to consumers from not being able to share as much generation capacity, an increased risk of power outages due to reduced security of supply, or failure to meet emissions reduction targets due to an inability to connect new renewable generation as the existing generation fleet retires.

We consider the sources of the most material uncertainties - and hence risks - to be:

---

15 National Electricity Law, s7.

16 See clause 5.16A.2 of the NER and the AER CBA guidelines p2

- Capital cost estimation[17]
- Coal retirement schedules[18]
- Impact on future demand from Electrification and DER uptake – including consideration of the future role of reticulated gas and the uptake and charging needs of electric vehicles[19]
- Completion of actions from AEMO's Engineering Framework and other related work to support the transition to increased renewable generation[20]
- Potential for Government Policy changes[21]
- Externalities in general, including
    - Social License issues[22]
    - Supply chain issues[23]
    - Resilience to Climate risks[24]

We have addressed many of these uncertainties in our previous report on the IASR.

The Panel considers that for the NEO to be satisfied, the ODP must represent a transparent balance of the most material risks – managed in a way that is consistent with the risk appetite of consumers. The rules require that we set out our *'assessment of the evidence and reasons supporting the Draft ISP'* in this report[25]. This report therefore includes our assessment of the evidence and reasons on whether "*the Draft ISP's ODP represents an appropriate balance of the most material risks to consumers*."

The ISP includes extensive forecasting and modelling. However, it is apparent from the Draft ISP that uncertainty cannot be managed by forecasting and modelling alone and there remains considerable need for the exercise of discretion and judgement by AEMO in the ODP, e.g. which projects should be made actionable in this ISP, should a project be made actionable in stages with 'early works' occurring first, what 'decision rules' are appropriate for staged projects, what

---

17 See Section 2.1.2

18 See Section 2.3

19 See Section 2.4 and our IASR Report section 4.4.3

20 We do not elaborate on these risks in this Report. See Draft ISP Executive Summary, page 11 and Section 7.2 *Risks to timely implementation of the Draft ODP network projects*, page 91

21 See our IASR Report

22 See Section 2.5

23 See Section 2.6

24 We do not elaborate on these risks in this Report. See Draft ISP section 9 Further analysis in preparation for final 2022 ISP, page 97

25 NER clause 5.22.7(e)

future projects or REZs justify spending some money now on 'preparatory activities' or 'REZ design reports' to have better information for the next ISP.

Gravity seems to always result in the cost of risk falling on consumers. All actions that reduce uncertainty and risk therefore increase the likelihood that the modelled benefits actually reach consumers - not just the costs.

The ISP is prepared every 2 years, and this recurring cycle gives AEMO an opportunity to reconsider these questions each ISP based on improved information. We consider that key questions for AEMO when making decisions on these issues in a manner that best manages uncertainty and seeks to promote the long term interests of consumers are:

- Is the evidence strong enough to justify committing to the project now and investing consumers' money in it, or should we wait to make a final decision at the next ISP when we have better information on options, costs and benefits?
- If we're not sure, what can we do now to make some progress on the project in a way that minimises the risks and helps get better information for the next ISP?

# 2 The ISP as a Risk Assessment for consumers

## 2.1 The risks of under or over investing in the shared network

As we explained earlier, we consider the ODP as a proposal for a major infrastructure investment program on behalf of current and future consumers – navigating the 'co-optimisation' of transmission, generation and storage to meet consumers' future energy needs. But the range of possible futures is enormous. How well does the ODP (as a set of investments in the shared network, generation and storage starting now) cater for what electricity consumers will need in 2030 or 2060, given the asset life of the investment?

The Australian Standard approach to Risk Management sets out a generic process of Risk Assessment that includes the steps of risk identification, risk analysis and risk evaluation[26]:

> *Risk assessment should be conducted systematically, iteratively and collaboratively, drawing on the knowledge and views of stakeholders. It should use the best available information, supplemented by further enquiry as necessary*

This well used process[27] certainly appears suitable for adoption by consumer stakeholders to engage with the complexities of the ISP. Re-framing the ISP's role as a Risk Assessment for the consumer interest is unlikely to be intuitive to all consumer stakeholders but we encourage AEMO to work with the Consumer Panel and consumer stakeholders to develop this further.

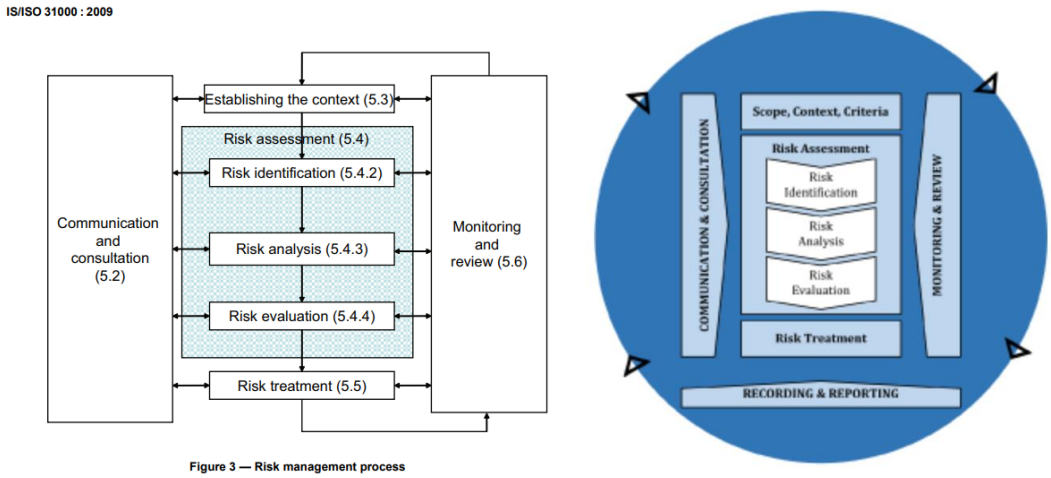



**Figure 1:** Standard risk management process from 2009 (left) and 2018 (right) versions of the guidelines

26 AS ISO 31000:2018 s6.4

27 The 2018 update of the standard did not materially change the approach published in the 2009 version

The following sections separately explain the risks of over investment (section 2.1.1) and under investment (section 2.1.2). We then explain the key sources of uncertainty – and hence risk – being managed by the ISP.

### 2.1.1 Risks of Over or Premature Investment

If the ODP represents over-investment or premature investment (paying too much for the capacity added to the shared network, building too soon or in the wrong place), this expenditure will add to the asset bases of regulated Transmission Network Service Providers (TNSPs) and consumers will pay more than is necessary or start paying sooner than necessary.

Our approach to assessing these risks starts by acknowledging that: Given the principal role of Cost Benefit Analysis (CBA) in ranking candidate development paths and determining the ODP, the modelling and analysis *could* recommend an ODP that represents over or premature investment for consumers *if* the modelling were to underestimate **costs** *and/or* overestimate **benefits**.

The sources of uncertainty that the Panel considers are the most material in this regard are capital cost estimation, coal retirement schedules and demand growth assumptions.

- Underestimating the actual cost of transmission (Section 2.2) – including the impact of securing "social license" (Section 2.5) and absorbing "supply chain" pressures (Section 2.6). The modelling and analysis *could* be biased away from pursuing the long term interests of consumers if decisions are being made on costs that do not reflect the actual capital expenditure that finds it way on to the regulated asset bases of the TNSPs and hence paid for by consumers.
- Overestimation of the benefits that accrue to consumers could occur if:
  - Coal retirements occur more in line with as 'announced' than the early closures in the scenarios. Catering for early closures comes at a cost, what if 'other measures' (eg capacity market payments) result in a more orderly retirement schedule? Coal retirement risks are discussed more below (Section 2.3)
  - Modelled demand growth does not appear for reasons such as:
    - unmet hydrogen expectations
    - slower than expected uptake of EVs – or uptake is as expected but the demand this places on the grid is 'smoother' than expected
    - delays to the extent of electrification in the economy
    - economic stagnation or de-industrialisation
    - the rise and rise of DER undermining the need for transmission.

    Managing the uncertainty in demand growth assumptions is discussed further below (Section 2.2)

### 2.1.2 Risks of Under or Overdue Investment

If the ODP represents under-investment in the shared network (too little and/or too late), consumers will pay more than they need to for electricity as well as face an increased risk of reduced security of supply and a failure to meet carbon budget targets due to an inability to connect new, renewable generation and storage.

Our approach to assessing these risks starts by acknowledging that: Given the principal role of Cost Benefit Analysis (CBA) in ranking candidate development paths and determining the ODP, the modelling and analysis *could* recommend an ODP that represents under or overdue investment for consumers *if* the modelling were to underestimate **costs** *and/or* overestimate **benefits**.

For example, implementation challenges in the build out of the transmission network to reach renewable energy zones could limit options to manage uncertainty in coal retirement dates. Coal generators retiring sooner than the AEMO's scenario weighted modelling assumes could lead to increased risks of blackouts and high electricity prices as we have seen in past events – eroding the benefits that were modelled.

The sources of uncertainty that the Panel considers are the most material in this regard are capital cost estimation (Section 2.2), coal retirement schedules (Section **Error! Reference source not found.**), the implementation risks from uncertainty in the ability to secure social license (Section 2.5), and schedule risks from supply chain bottlenecks (Section 2.6).

## 2.2 Capital cost estimation risks

High Voltage transmission infrastructure is expensive (millions of dollars per km) and we have recent examples (such as Project Energy Connect and HumeLink) of cost estimates materially increasing as projects are more precisely defined.

The Draft 2022 ISP ODP recommends initiating significant capital expenditure on transmission (our estimate is for at least $20 billion by 2040). There is significant uncertainty as to these future costs yet assumptions around cost and schedule are vital to selecting the 'optimal' development path.

A key risk to consumers then is that these network projects cost significantly more and take significantly longer to build than how they were modelled. Social licence, environmental approvals and the COVID fuelled shortage of skills and materials in a hot major construction market all complicate the estimation process. The recent history of major projects in Australia is

one of large cost overruns[28] and Infrastructure Australia has recently highlighted the serious cost pressures in electricity transmission[29]. Resolving social licence costs is complex and time consuming and networks are 'learning by doing' (e.g. the current experience of AusNet in developing the Western Victorian Transmission Network Project) and not always getting it right. Recent experience for Project Energy Connect and HumeLink has shown considerable capex cost increases through the RIT-T process[30].

The need to develop more robust capital cost estimates is the subject of the current *'Material Change in Network Infrastructure Costs Rule Change'*[31] that is being considered in parallel with the AEMC's Transmission Planning and Investment review[32]. The rule change has been proposed by a coalition of the EUAA, MEU, Shell Energy and AGL. The key aim is to ensure that more accurate estimates of transmission capital costs are used in the RIT-T process so that consumers can be confident that a project finally approved by the AER through the Contingent Project Approval process is in the long term interests of consumers.

The Panel's submission on the Final IASR[33] congratulated AEMO for the considerable work they did to develop the Transmission Cost Report[34] and the rigor it brought to the 2022 ISP. Improved cost estimates through the RIT-T process and comprehensive early works that gives confidence on route selection and social licence costs can be expected to minimise the residual risk of cost and timetable overrun during construction. Cost pass through risk for consumers is minimised and all stakeholders have increased confidence about the timetable (under investment risk) because firming up route selection, addressing social licence issues and improving the accuracy of the cost estimate means construction can start quickly if required.

---

28 See Grattan Institute https://grattan.edu.au/wp-content/uploads/2020/11/The-Rise-of-Megaprojects-Grattan-Report.pdf

29 See https://www.infrastructureaustralia.gov.au/market-capacity-electricity-infrastructure

30 See discussion pp 82- 87 in the Panel's Final IASR submission

31 See www.aemc.gov.au/rule-changes/material-change-network-infrastructure-project-costs

32 See www.aemc.gov.au/market-reviews-advice/transmission-planning-and-investment-review

33 See https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel at p44 and Appendix B.

34 2021 Transmission Cost Report https://aemo.com.au/consultations/current-and-closed-consultations/transmission-costs-for-the-2022-integrated-system-plan

## 2.3 Coal retirement uncertainty

The Panel is aware of significant stakeholder interest in the treatment of the closure of the NEM's existing coal fleet in AEMO's modelling. We are also aware of the significant uncertainty that must be managed by the ISP when recommending the ODP. AEMO states:[35]

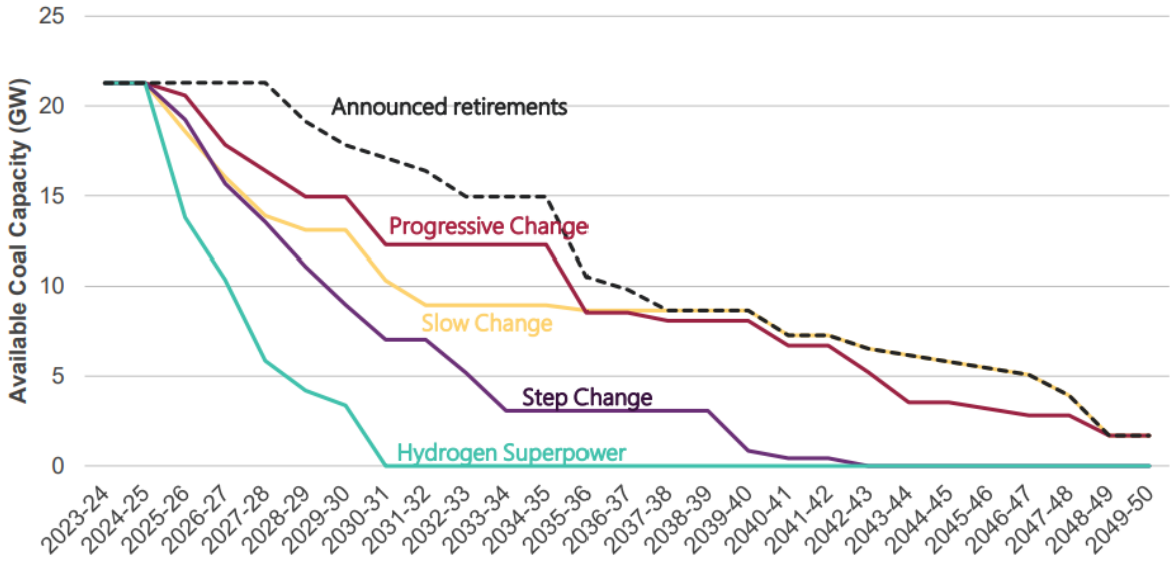
> *The ISP seeks to find the most cost-efficient balance between investment in network transmission … and in dispatchable capacity to complement renewable generation development. The less transmission capacity there is, the more dispatchable capacity is needed, and vice versa.*

AEMO also states that decisions by owners of coal generators:[36]

> *remain necessarily uncertain, as they grapple with operating dynamics in the face of cheap renewable generation, their own competitive strategies, plant conditions, regulatory and remediation costs, and the wishes of local communities (to either close or remain open). Given these uncertainties, the effective coordination of closures will be extremely challenging, and prudent planning takes into consideration the potential impacts of less coordinated closures on consumers.*

The ISP's approach to managing these risks is dominated by the use of scenarios to reflect possible retirement schedules. AEMO's Figure 18 illustrates this:[37]

Figure 18 Forecast coal retirements, all scenarios versus announced retirements




35 Draft ISP, p44.

36 Draft ISP, p45.

37 The data behind these charts has been published with the Draft ISP but it does not seem possible to trace back to the specific generation units being "retired" by the modelling.

We would characterise this particular risk to the long term interest of consumers in terms of the **uncertainty** being managed by the ISP: the uncertain timing of the retirement of the NEM generation fleet.

The Draft ISP considers retirement risks through adopting different 'retirement schedules' in each scenario. The analysis has the effect of short listing Candidate Development Paths based on a retirement schedule that reflects the scenario weights. The ODP is then selected by AEMO by considering 'option value' and possible 'regret costs' should coal generators retire sooner than in the most likely scenario (Step Change). This is discussed further below in Section 3.6.1. The AER's Transparency Reviews have twice sought more transparency on the approach as discussed in Section 2.3.2.

### 2.3.1 Our understanding of AEMO's approach[38]

Even though all generators are required to inform AEMO of their expected closure year and provide at least 3 years' notice of closure,[39] the potential for early retirements is explored further given the materiality of their impact on how the power system meets consumer needs.

In order to test the implications of faster retirement of capacity than the dates publicly announced by generators, AEMO uses one of two different approaches to generation retirements depending on the scenario:

- The Slow Change and Progressive Change scenarios have the primary driver of retirements being on the basis of wholesale prices, and therefore the primary determinant of retirement is forecasting wholesale prices.[40]
- Step Change and Hydrogen Superpower use a cumulative carbon budget (page 33) of 891 Mt CO2-e and 453 Mt CO2-e respectively.[41] In these scenarios, AEMO determines a retirement trajectory through least-cost modelling which takes these cumulative emissions into account.

---

38 The ISP Methodology sets out AEMO's approach to Early Generator retirements at p35 - see https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/isp-methodology The risk to consumers of faster than expected coal retirements is also set out in the Draft ISP at pp44-46.

39 See NER clauses 2.2.1(e) and 2.10(c1). AER may provide exemptions to the 3-year notice requirement.

40 On the basis that no coordinated whole-of-economy decarbonisation strategy exists so retirements are primarily driven by the commercial decisions of consumers and industry.

41 To put this in perspective, AEMO chart data shows NEM emissions over the last 5 financial years averaged around 150 Mt CO2-e **per annum**

### 2.3.2 What the AER has said in its Transparency Reviews

The AER has made reference to the management of these risks in the Transparency Review Report for the IASR (August 2021) and, again, for the Draft 2022 ISP (January 2022) and called for further consultation.

The AER's Transparency Review Report for the Draft 2022 ISP made specific reference to "Thermal coal plant retirements" and made the following comments:[42]

> *We therefore expect AEMO, in an addendum to the draft ISP, to provide further explanations of:*
>
> - *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.*

### 2.3.3 Our Assessment of Coal Retirement Risks

We would characterise this particular risk to the long term interest of consumers in terms of the **uncertainty** being managed by the ISP: the uncertain timing of the retirement of the NEM generation fleet. As AEMO states:[43]

> *Owners of coal generators have already either brought forward their announced retirements, or indicated they would. Their decisions remain necessarily uncertain, as they grapple with operating dynamics in the face of cheap renewable generation, their own competitive strategies, plant conditions, regulatory and remediation costs, and the wishes of local communities (to either close or remain open).*

History suggests consumers should be concerned by the potential cost impacts of coal closures. A period of high spot market prices from 2014–15 to 2018–19 resulted from the tighter supply-demand balance in the wholesale market as thermal power stations exited the market at short notice and translated to high contract prices for energy consumers.[44]

---

42 AER, *Transparency Review Report – Draft 2022 Integrated System Plan*, January 2022, p3.

43 Draft 2022 ISP, pp 44-45

44 This included closure of major coal fired plants in New South Wales (EnergyAustralia's 500 MW Wallerawang C-2 in April 2014), South Australia (Alinta's 540 MW Northern Power Station in May 2016) and Victoria (Engie's 1600 MW Hazelwood in March 2017). - Australian Energy Regulator, *State of the Energy Market – 2020*, June 2020, p 13

The Draft ISP appears to cater for a range of possible retirement schedules and initiates investments with 'option value' and low 'regrets' should coal generators close faster. We support the findings of AER's Transparency Report to consult further on assumptions made. However, The Panel remains concerned that the ISP is being asked to manage such a significant **breadth of uncertainty** in coal retirements.

Of course, accelerating the transmission build is not the only risk treatment option available for consumers to rely on. On this front, existing and potential 'risk treatments' that target this uncertainty – such as the introduction of mandatory closure notice periods[45] and ongoing discussions of other market and regulatory measures through the Energy Security Board[46] - must be considered as part of the consumer interest "risk equation".

---

45 Rule Change here www.aemc.gov.au/rule-changes/generator-three-year-notice-closure and Exemption Guideline here www.aer.gov.au/wholesale-markets/guidelines-reviews/generator-notice-of-closure-exemption-guideline

46 See https://esb-post2025-market-design.aemc.gov.au/resource-adequacy-mechanisms-and-ageing-thermal-retirement

## 2.4 Demand uncertainty

As we have said above, the ISP *could* recommend an ODP that ends up being over or premature investment *if* the modelling and analysis were to underestimate **costs** *and/or* overestimate **benefits**. Fundamental to the risk of over or under investment is that demand is forecast to grow under all but the slow change scenario (see below) meaning that net benefits are likely to be overestimated if that demand doesn't appear.

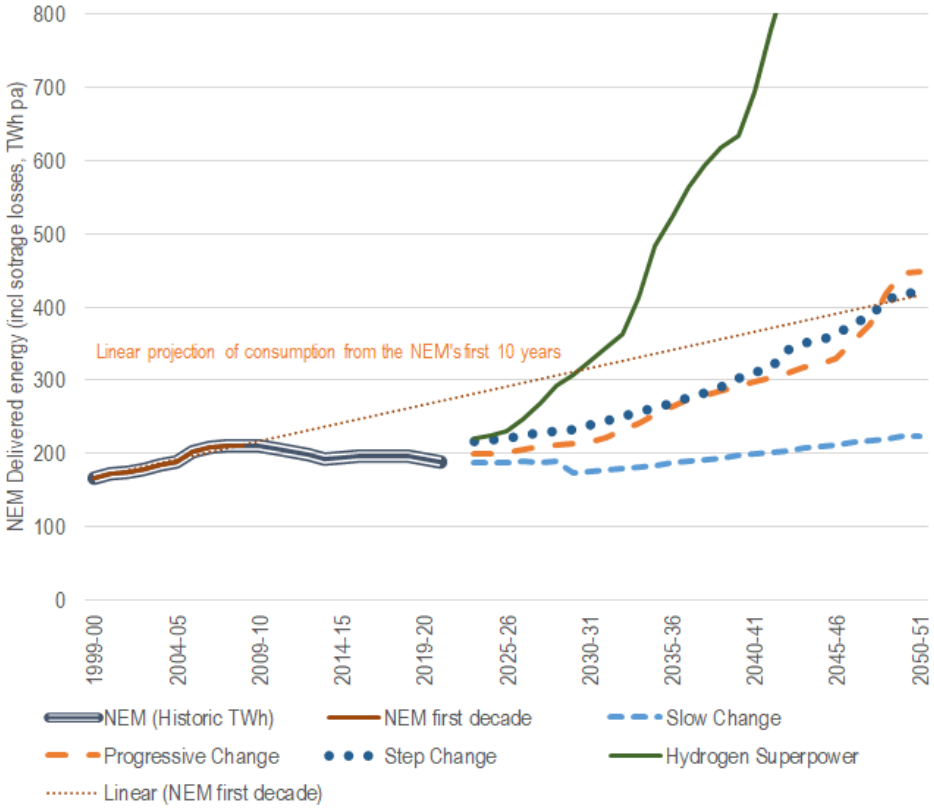



**Figure 2:** Electricity consumption projections compared to historic (Source Panel analysis of AEMO and AER data)

In our previous report on the IASR we commented on the need to consult further on the impacts of the electrification projections from the "multi-sector modelling" due to their uncertainty and materiality:[47]

> *This issue could be a critical input for the 2022 ISP. However, due the rather limited and very late engagement by AEMO on this issue, we remain unsure of the robustness of the inputs and assumptions and the materiality of this issue (e.g. will it drive investment in the next decade, or only after 2030 so we have time to improve the forecasts).*

---

[47] See Section 4.4.3 of that report. Available from https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel

*AEMO first mentioned to stakeholders that it would undertake the multi-sector modelling work in March 2021. However, we were not alerted by AEMO to the potential materiality of this issue until May 2021 and there was no consultation on draft outputs of the consultants' work until late June. .... This limited consultation made it impossible for us and other stakeholders to meaningfully engage on this issue or influence the inputs and assumptions. If this issue and its materiality had been raised earlier, we would have devoted more resources to it. This issue is also a good example of AEMO's over-reliance on the Forecasting Reference Group, as this issue requires AEMO to engage with a much broader group of stakeholders including stakeholders from outside of the electricity sector.*

*We also agree with the AER's finding in its Transparency Review that AEMO could have better coordinated this engagement and consultancy work on 'multi-sector modelling' with its separate engagement and consultancy work on related inputs regarding energy efficiency, DER adoption, transport electrification and fuel switching.*[48] *We support the AER's recommendation that AEMO better explain the relationship between these issues and consult on them in a more coordinated way in future ISPs.*

*This issue may also warrant additional consultation between the IASR and final 2022 ISP if it does indeed have a material impact on outcomes.*

Given these comments and that no further modelling or consultation has been possible, there remains significant uncertainty in our minds over the robustness of these forecasts.

Not only does the volume of energy determine investment patterns, equally important is the 'shape' and location of that demand across the day and across the seasons. Contributing to the uncertainty in demand being managed by the ISP therefore is the scale and 'coordination' of distributed energy resources and electric vehicle charging and discharging infrastructure.

Further, the demand projections of the Hydrogen Superpower scenario Strong Electrification Sensitivity represent such extreme differences from the others yet have such inherent uncertainty due to their speculative nature, that the Panel is not convinced consumers have expressed a "risk appetite" that supports the idea of catering for the possibility by investing in the NEM's shared network now.

Overall, based on our experiences engaging with consumer stakeholders, this is an area of significant interest and AEMO should consider this topic as one for a targeted Risk Assessment.

---

48 AER, *Transparency Review: Integrated System Plan 2022 Final Inputs Assumptions and Scenarios Report*, August 2021, p17.

## 2.5 Social License risks

The Draft 2022 ISP calls out Social License issues as one of two new high-priority NEM challenges arising:[49]

> *from the pace and scale of transformation [that] require urgent and continuing focus. The first is the need to secure community and land owner support for the large amount of VRE, storage and network development signalled in this plan. While generation, transmission and distribution assets have always been a difficult local planning issue, the transformation will require greater local community support for the proposed use of larger amounts of land, potentially including dual-use considerations.*

As emphasised by the Australian Energy Infrastructure Commissioner:[50]

> *Effective community consultation and engagement is essential for large-scale renewable energy projects to gain widespread support and earn the 'social license' to operate within the community. To be effective in community engagement, it is vital to actually 'engage the community' and involve the community wherever possible in the design and execution of programs related to the project.*
>
> *Conversely, poor or no community engagement can allow misinformation and community opposition to a project to gain momentum – which can ultimately lead to projects not proceeding as a result of planning objections through to endless delays from lengthy and costly legal actions against the project.*

These lessons apply to new transmission projects as much as they do to renewable energy projects. AEMO states that 10,000 km of new transmission is needed to connect new renewable energy, storage and other new generation projects to the places consumers need it.[51] However, this scale of new infrastructure has not been built since a time with very different planning frameworks and community attitudes.[52]

From the perspective of the ISP as a Risk Assessment for consumers navigating the energy transition, the challenges of securing social license for so many projects contribute material

---

49 Draft ISP, p22.

50 Australian Energy Infrastructure Commissioner, *Community Engagement (aeic.gov.au)*

51 Draft ISP, p8. 10,000 km is a circa 20% increase on the NEM's current transmission network length of 43,000km – see www.aer.gov.au/networks-pipelines/performance-reporting/electricity-network-performance-report-2021

52 For example see www.abc.net.au/news/2021-11-21/energy-grid-alliance-warn-ausnet-ees-unlikely/100624096

uncertainty in both costs and implementation schedules that exacerbates BOTH the risk of over investment AND under investment.

The *Material Change in Network Infrastructure Costs Rule Change*[53] mentioned above, highlights how material uncertainty in 'social licence' costs – such as the costs of land acquisition and biodiversity – contribute to material uncertainties in capex estimates. A recent illustration of this was, the RIT-T Conclusions Report for HumeLink published in July 2021 had 'social licence' costs at $935m or 28% of the total estimated capex - three times the cost estimated in the earlier stage of the project Cost Benefit Analysis published in January 2020.

The Australian Energy Infrastructure Commissioner has observed many examples of success and failure in the pursuit of social license. An approach that has contributed to increased success in the case of renewable energy projects has been formal agreements with landholders:[54]

> *Landowner agreements are not limited to hosting wind turbines or solar arrays – they may also be required to allow easements for high voltage transmission corridors, private powerline routes to connect the power station, substations... [L]andowner agreements (such as agreements for transmission line easements, easement access or road access) should also be negotiated and finalised with the landowners in a fair and reasonable manner, with appropriate consultations engaging affected landowners and neighbours in determining the final approach and routes to be taken.*

From a 'whole of cost to consumers' perspective, increased costs from landholder agreements would need to be traded off against the benefits of increased certainty that a project, if initiated by the ISP, can be built in a timeframe that still makes it an 'optimal' choice. These are complex tradeoffs that are being made on behalf of consumers by default.

### 2.6 Supply Chain pressures

The Draft 2022 ISP calls out Supply Chain issues as one of two new high-priority NEM challenges:[55]

> *arising from the pace and scale of transformation [that] require urgent and continuing focus. The second is that Australia is not alone in this race to decarbonise. The already heavy investment in global power systems is expected to surge in the wake of COP26.23 This is on top of a long-running and accelerating global boom in infrastructure investment – from a public perspective to catch-up on infrastructure needs, and from an investor perspective as a newly favoured asset*

---

53 See www.aemc.gov.au/rule-changes/material-change-network-infrastructure-project-costs

54 Australian Energy Infrastructure Commissioner, *Host Landowner Matters (aeic.gov.au)*

55 Draft ISP, p22.

*class in a low-interest-rate environment. These trends will require continued focus on supply chain reliability, availability of skilled labour, and cost management for power system development in Australia. Some actionable ISP projects have already experienced schedule delays, and such slippages are likely to continue.*

The history of major projects in Australia is one of large cost overruns[56] and Infrastructure Australia has recently highlighted the serious cost pressures in electricity transmission.[57]

The Panel acknowledges the work that AEMO has done in reaching out to Infrastructure Australia and partnering on research but considers this a risk that is not yet managed to a degree that would satisfy the 'risk appetite' of most consumers.

---

56 See Grattan Institute https://grattan.edu.au/wp-content/uploads/2020/11/The-Rise-of-Megaprojects-Grattan-Report.pdf

57 See https://www.infrastructureaustralia.gov.au/market-capacity-electricity-infrastructure

# 3 Assessment of the evidence and reasons supporting the Optimal Development Path of the Draft ISP

## 3.1 Our approach to assessing AEMO's evidence and reasons

The rules require that we set out in this report our 'assessment of the evidence and reasons supporting the Draft ISP'. In doing so, we are required to 'have regard to the long term interest of consumers'.

The ISP is an extremely complex exercise, requiring AEMO to forecast how the energy system, and how consumers use it, may change over the next 30 years.

Cost Benefit Analysis (CBA) is the approach AEMO uses to develop and test alternative development paths, and ultimately determine the ODP:[58]

> *The ODP is the suite of actionable projects which best serves the long-term interests of consumers of electricity by minimising the risk of over- and under-investment given all the uncertainties in the energy future. It also delivers positive net market benefits in the most likely scenario.*
>
> *The appropriate test for that investment is a transparent CBA approach that considers the costs and benefits of alternative development paths, and the robustness of those paths under different futures.*

As stated in earlier chapters, our approach to assessing whether the ISP promotes the long term interest of consumers is to weigh up how well the ODP – and the consultation, analysis and judgment used to derive it – manages the risks to consumers of over or under-investment in the power system during the energy transition.

Our assessment of the evidence and reasons provided by AEMO follows and identifies areas where AEMO should:

- provide further explanation or evidence to support its views that the ODP and decisions on actionable projects appropriately manage this uncertainty and promote the long term interests of consumers; and
- consult further with stakeholders, including representatives of consumers, to understand their preferences for how the remaining uncertainty should be managed.

---

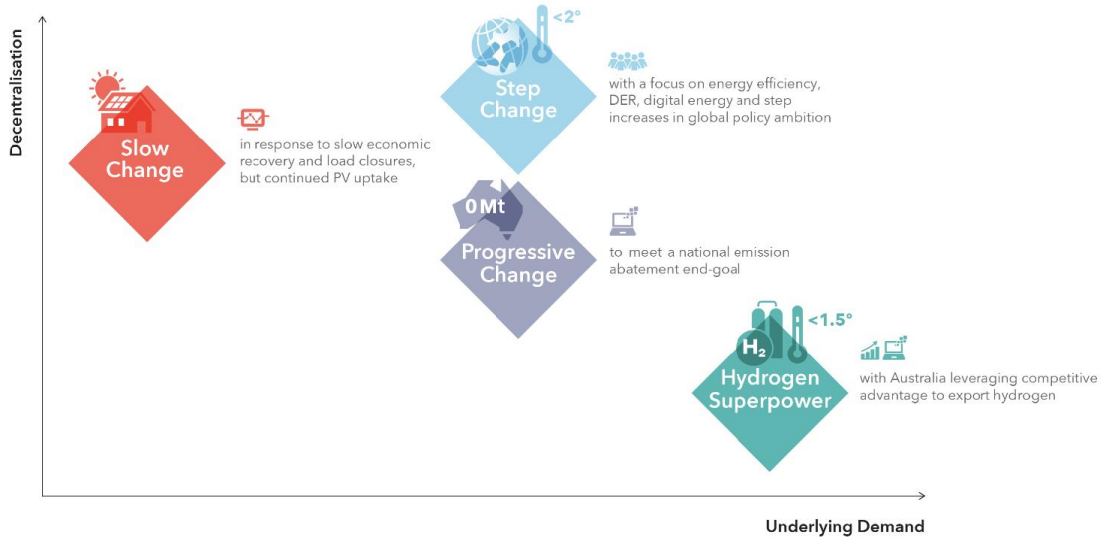
58 ISP Methodology, section 5.

## 3.2 The critical role of scenario weights in selecting the ODP

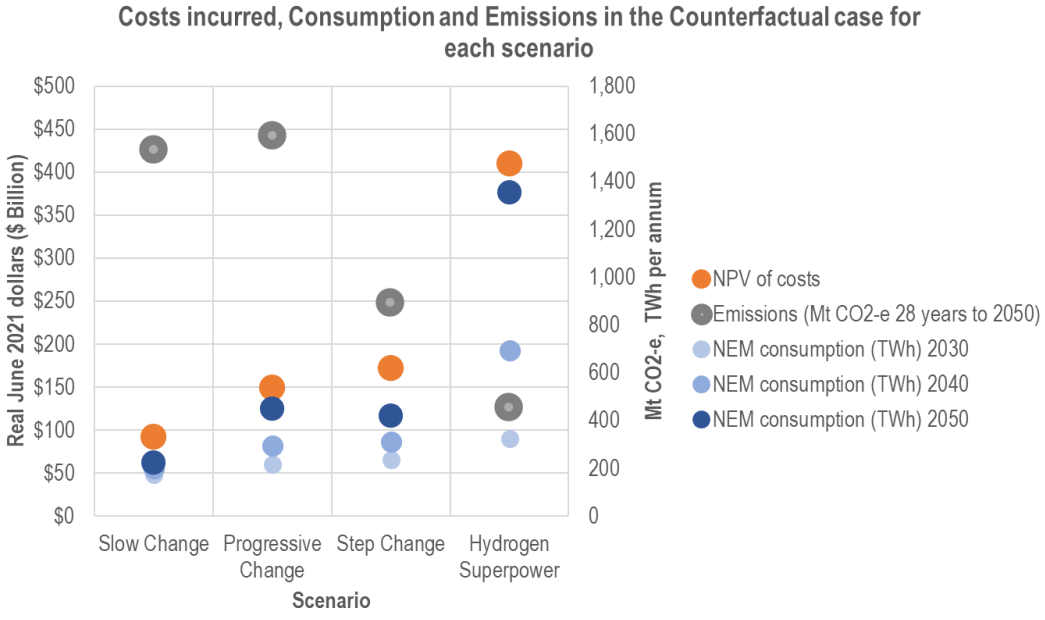
### 3.2.1 Overview of the ODP selection process

The use of scenarios as the basis for the ISP is a fundamental tool for managing the risk of over and under-investment. The Draft ISP uses four scenarios that represent very different possible future worlds. Each scenario therefore triggers a very different investment pattern in terms of the types of investment, and its quantity, timing and location. The IASR also included a fifth scenario ('Steady Progress'), which AEMO removed for the Draft ISP. AEMO summarises the scenarios in the following diagram from the Draft ISP.

Figure 6 Scenarios used for the Draft 2022 ISP




As highlighted in the following chart prepared by the Panel from AEMO data, the scenarios have very different outcomes in terms of costs, electricity consumption and emissions (and many other factors):



The ISP's cost-benefit analysis and optimisation of alternative investment options must include some way of considering the relative likelihood that reality for consumers in 2030 and beyond looks like the world depicted by each scenario.

AEMO's assessment of the ODP is primarily based on a 'scenario-weighted' cost-benefit assessment. Under this approach, AEMO assesses the net benefits of various 'candidate development paths' (CDPs, which each represent a different potential set of investments in network, generation and storage assets) under each scenario. It then applies a weight to each scenario based on the relative likelihood of it occurring and determines a 'weighted average net benefit' for each CDP using those weights.

AEMO also uses a 'least worst regrets' approach. This approach aims to identify the development path that would cause the least regret associated with under or over-investment considering the uncertainties reflected across the various scenarios. It does so by calculating the 'regret' based on the weighted difference in net benefits between CDPs under different scenarios. This helps identify which development path is most resilient to changes in circumstances.

### 3.2.2 The challenges of relying on the Delphi Panel process for selecting scenario weights

Under both the weighted net benefits and least worst regrets approaches, the decision as to what weight to apply to each scenario has a major impact on the outcomes of the cost-benefit analysis.

The Draft 2022 ISP used a 'Delphi Panel' technique to derive a set of scenario weights to use in the ISP analysis. AEMO explains this process as:[59]

> *The Delphi technique draws on an anonymous panel of up to 10 subject matter experts, both internal and external to AEMO, to rank the relative likelihood of each scenario using a questionnaire, and provide reasoning for their selection. Responses are collected, analysed, common and conflicting views identified, and shared with the panel. Panel members then have the opportunity to modify their original views based on the varying positions of other panel experts, with the goal being to reach consensus where possible.*
>
> *Following this process, a stakeholder workshop provides the opportunity for discussion with a broader range of stakeholders, seeking feedback on the reasonableness of weights proposed through the Delphi technique.*

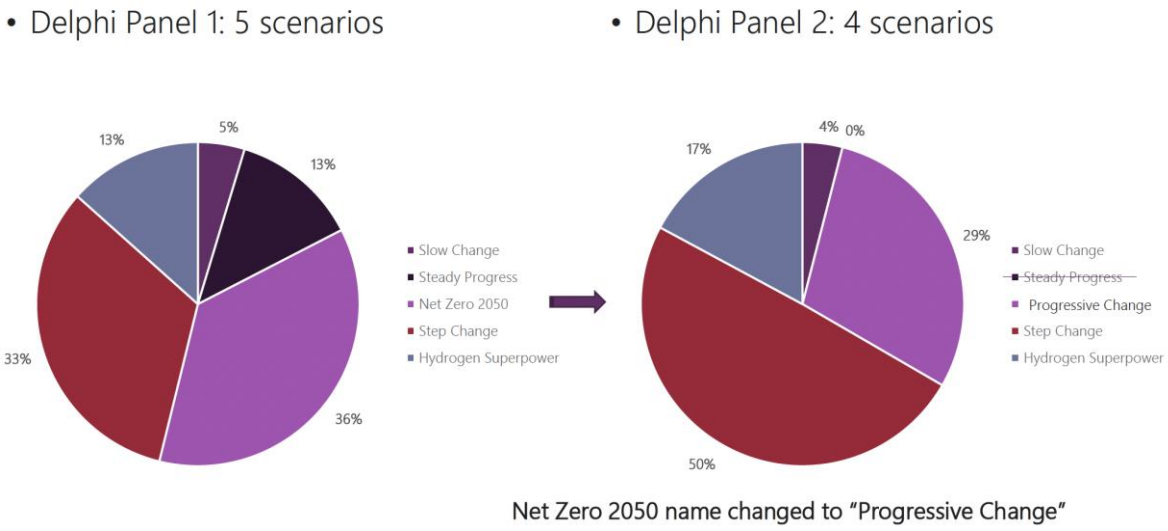
The Panel supports the use of the Delphi Panel technique as a reasonable approach to this challenge with our comments focussing on how it was applied by AEMO in this case. This

---

59 ISP Methodology, p88.

process is a significant improvement on the 2020 ISP, where scenario weights were determined solely by AEMO staff without consultation prior to the draft ISP. However, we feel it is important to highlight the significant judgement that is being exercised during the implementation of the technique and interpretation of the results.

AEMO held two Delphi Panel sessions. After the first session, it advised participants that a second panel was not going to be required. However, following the public forum to consult on the results of the first Delphi Panel session where some stakeholders put the view that weights may have changed given the Australian government's announcements in the lead-up to the Glasgow COP 26 climate change conference discussions, it decided to hold a second panel session. There was no public consultation on the results of the second Panel, which were adopted by AEMO as the Draft ISP weights. The results of each session are shown in the chart below from AEMO's Consumer Forum on 15 December 2021:




We observed the first Delphi panel session but were not informed by AEMO of the decision to hold a second session and were not invited to observe it. On the basis of Panel 1, the sessions appeared to be too rushed to get meaningful debate between participants, which is a key part of the Delphi process. In future, there would be merit in holding longer sessions and/or having a smaller group of participants to enable more robust discussion.

Not all participants attended both sessions and there were fewer participants in the second session. There appears to be a high risk that the results were heavily influenced by who attended each session. There were also an insufficient number of consumer representatives in the second Delphi session (two out of twenty), which could have been avoided if we were aware of the session and could have encouraged people to attend.

AEMO's decision to enlarge the size of the Delphi Panel and not include the views of the AEMO members in the scenario weights also does not appear to be consistent with the ISP

Methodology, which provides that the Delphi Panel will be 'an anonymous panel of up to 10 subject matter experts, both internal and external to AEMO'. It was also unfortunate that AEMO did not hold a public consultation session on the outcomes of the second Delphi panel, as it did for the first panel and committed to under the ISP Methodology. AEMO should have consulted on such important departures from the ISP Methodology prior to adopting the results for the Draft ISP.

For the 2024 ISP, we would encourage AEMO to engage more closely with the Consumer Panel on the size, make-up and conduct of the Delphi Panel process.

In our view, the ODP appears too sensitive to the Delphi Panel-derived scenario weights. The change in results between the two rounds of convening the Delphi Panel, and the impact these changed weights had on the selection of the ODP, is evidence that supports further sensitivity testing of the ODP to different scenario weights and a range of other sensitivities.

To illustrate this point:

- The Draft ISP used the weights from Delphi Panel 2, excluding the AEMO staff. This resulted in the step change scenario being the 'most likely' scenario with a weight of 50%. These weights were critical in AEMO selecting an ODP that included VNI West, HumeLink and MarinusLink as actionable projects on the basis that this development path had the second highest weighted average net benefit and reduced regrets if the Hydrogen Superpower scenario eventuated.
- If the Draft ISP had instead used the weights from Delphi Panel 1 including AEMO staff, the Progressive Change scenario would have been the most likely with a weight of 36% and Step Change would only have had a weight of 33%. With these weights, the analysis in the Cost Benefit Analysis Appendix of the ISP indicates that there would be higher net benefits from not making any of VNI West, HumeLink or MarinusLink actionable projects in the 2022 ISP and instead waiting to the 2024 ISP to determine their optimal timing.

This sensitivity to weightings highlights the level of judgement inherent in the ODP selection stage of the ISP. We recommend that AEMO recognises the uncertainty and subjectivity inherent in any scenario weightings and uses a range of other tools to determine the ODP including increased sensitivity testing.

### 3.3 The risk of putting too much weight on very small differences in modelling results

AEMO's cost benefit assessment process assesses the net benefits of each CDP against a counterfactual. The counterfactual assesses the costs and benefits in a world where the same emissions targets, policy settings and other inputs and assumptions still apply, but those outcomes must be met without building any significant new transmission projects. This is

arguably a very unrealistic counterfactual, eg it requires significant over-build of renewables to meet emissions reduction targets without any new transmission being built. However, it is useful for showing the benefits of transmission and providing a common basis for calculating the relative benefits of each CDP.

The cost benefit assessment is an extremely important part of the ISP and plays an important role in identifying the potential projects that could have the most benefit for consumers and arrange closer examination. However, we caution against placing too much reliance on the outcomes of this modelling assessment given the very small differences in outcomes between the leading CDPs relative to the high level of uncertainty involved.

AEMO calculates that the weighted net market benefits of the ODP are over $29 billion compared to the counterfactual. This is an extremely large number that clearly shows the benefits of some investment in transmission to support the transition to renewable energy. But the top 12 CDPs AEMO examines in more detail **all** have weighted net market benefits of more than $29 billion. The difference in net benefits between CDP9 (no actionable ISP projects) and CDP10 (selected as the ODP) is just over $300m. The difference between the top 6 CDPs is less than $100 million, with the difference between the top 2 being just $20 million. Deciding the ODP based on $20 million out of $20 billion is the equivalent to deciding between two $20 items based on a price difference of 2 cents.

Given the high level of uncertainty over the 30-year timeframe for the ISP, we do not think that decisions can reliably be made based on an estimated difference of $20 million out of $29 billion, ie less than 0.1%. This modelling should therefore not be the sole basis for decision making and instead be used to narrow down the options and inform what additional analysis and consultation is needed.

### 3.4 Uncertainty of the Hydrogen Superpower scenario

The Consumer Panel also considers that the weighting assigned to the Hydrogen Superpower scenario does not acknowledge the uncertainty that exists in what is an outlier scenario in terms of the implications for investment. Outcomes under this scenario have a significant impact on AEMO's least worst regrets analysis, despite AEMO acknowledging in the IASR process that its inputs and assumptions for this scenario were highly uncertain and stating that it was likely to place very little weight on this scenario. This approach risks consumers being required to fund investments now as insurance against an outcome that is very unlikely and uncertain.

The Panel it is not convinced consumers have expressed a "risk appetite" that supports catering for the possibility by investing in the NEM's shared network now.

The ISP Consumer Panel Report on the 2022 IASR[60] recommended AEMO "*Focus efforts on inputs and assumptions that are most material to the consumer interest and have most uncertainty*". Our recommendations also identified Hydrogen as one of a short list of topics for AEMO to "*Consider alternative or additional ways of forecasting and engaging on these material, but highly uncertain, inputs and assumptions for the 2024 ISP*". We noted that:

> *While stakeholders expressed a great deal of interest in the role of hydrogen in the different scenarios, there is much uncertainty in the demand for hydrogen from Australia's future export and domestic economies. A strategic approach to further forecasting is warranted.*

AEMO responded to this comment in the Draft ISP:[61]

> *The best way of developing forecasts for these things will be part of developing the next set of forecasts, as part of the 2024 ISP. The emerging role for hydrogen is rapidly evolving and forecasts will be monitored and reviewed extensively as better information comes to hand.*

However – and highlighting the uncertainty – even since publishing the above statement in the Draft 2022 ISP, AEMO have proposed changing the scenario name to *Hydrogen Export*: [62]

> *to enable potential future adjustment to the scale of development appropriate in that scenario to reflect a likely future*.

We reiterate the recommendation from our report on the draft IASR that AEMO should not place significant weight on this scenario until it is more confident in the robustness of this scenario's inputs, assumptions and likelihood.

AEMO should also undertake further consumer engagement to understand the willingness of consumers to pay for expansion in the shared network to underpin a commercial export industry rather than domestic electricity supply. Consumers risk preferences in this regard would be more informed if AEMO explored this further in their work on Distributional Impacts.

### 3.5 Prioritising projects by risk

While we have some concerns that AEMO places too much weight on the modelling and CBA in the final stages of selecting the ODP, we do consider the ISP does a very good job of using the modelling to narrow down the thousands of potential CDPs to a more manageable set of decisions for AEMO and stakeholders to consider.

---

60 Recommendation B

61 Draft ISP, Appendix 1, p15

62 AEMO, *Draft 2022 Forecasting Assumptions Update*, December 2021, p5.

This modelling can be used to group the potential projects into the following three groups, and demonstrates that further analysis and consultation should focus on the optimal timing of the three key projects in the final group.

1. **Low regret actionable projects**: AEMO provides a strong justification that the Sydney Ring and New England REZ projects have significant benefits to consumers. These projects have large net benefits in almost all scenarios and continue to have material benefits under a range of different sensitivities, including significant increases in transmission costs. We support inclusion of these projects as actionable ISP projects for the 2022 ISP. They are critical to avoid under-investment and progressing them now involves a low risk of over-investment.

2. **Clear future projects:** AEMO examines a large number of projects to consider whether they should be actionable projects (ie progressed immediately) or future projects (ie likely to be needed in a future ISP), including several projects in Queensland. These projects may have benefits in some scenarios (eg Hydrogen Superpower) but not in most scenarios. There is benefit in waiting to the 2024 ISP to make a final decision on whether and when these projects should progress. We support AEMO's decisions on these future projects.

3. **Projects needing closer analysis:** There are three projects where the cost-benefit modelling alone does not provide a clear answer on whether they should be actionable in this ISP or wait until the next ISP, or whether they should be staged with some work now and some work later. These projects are MarinusLink, VNI West and HumeLink. AEMO determined that VNI West and HumeLink should be actionable projects, but with staging so that 'early works' would occur initially and then the full projects would only occur if specified 'decision rules' were met. AEMO determined that both cables of MarinusLink should be an actionable project and proceed now without any staging or decision rules. We consider that these projects, particularly VNI West and HumeLink, continue to involve considerable uncertainty and judgement. As explained below, AEMO should undertake a targeted engagement process with consumers to test whether this approach best balances the risks of under and over-investment and reflects consumers' risk preferences.

### 3.6 AEMO's toolkit for managing uncertainty in determining and progressing the ODP

The regulatory framework provides a number of tools for AEMO to manage the risks to consumers of over and under investment. In this section we present our views of how well these have been deployed to manage those risks.

### 3.6.1 Option value

The Draft ISP uses the concept of 'option value' to inform the optimal timing for several projects. AEMO uses it to estimate the value to consumers of commencing a project now as "insurance"[63] in case certain events happen that mean the project has increased value in the future.

The most notable place where option value is used in the Draft ISP is to assess whether to include a staged HumeLink as an actionable project. AEMO also uses option value to assess the benefits of staging VNI West.

The weighted average net benefits assessment shows that HumeLink is not part of the CDP with the highest net benefits. Net benefits are $20 million higher under a CDP that contains all of the other actionable projects but waits until 2024 to decide whether to make HumeLink actionable

However, AEMO calculates that additional option value would arise by making HumeLink actionable now. AEMO considers that doing so protects against the risk of slippage in the project's schedule or the early exit of NSW coal generators. AEMO calculates that there only needs to be a risk of schedule slippage of 10% of more for making HumeLink actionable now to increase the weighted net benefits of HumeLink by $20 million and justify making it actionable. AEMO calculates that there would similarly only need to be a 10% chance of 3 NSW coal generators closing by 2027-28 to increase HumeLink's weighted net benefits by $20 million.

Based on this analysis, AEMO concludes that this $20 million 'is a negligible regret or insurance cost' and that making HumeLink actionable with early works as the first stage 'would best align with consumer risk preferences.'[64]

We support the use of the concept of option value, but we have some concerns about the robustness of how it is used to justify AEMO's conclusions about consumer risk preferences. In particular:

- Considerable uncertainty remains in the weighted net benefits assessment in the ODP. Making decisions based on an estimated $20 million difference in net benefits out of a $29 billion total implies the modelling has greater precision than is in fact the case.
- AEMO's option value only considers the change in net benefits under certain situations where making it actionable now would **increase** the benefits of HumeLink. It does not consider other situations that could **decrease** its benefits, i.e., it does not assess the option

---

63 The Panel is not yet convinced by the use of the term "insurance" as consumers are likely to consider this as providing some sort of protection from adverse events, whereas in this context it is referring to expenditure to 'keep our options open'.

64 Draft ISP, pp 11-12 and 64.

value of waiting until 2024 when we may have better information. For example, the Cost Benefit Assessment in Appendix 6 of the ISP shows that the net benefits of HumeLink (as well as VNI West and MarinusLink) are very sensitive to the transmission costs estimates. A 30% increase in HumeLink's transmission costs would reduce its weighted net benefits by $188 million, resulting in total weighted net benefits of negative $448 million compared with waiting until a future ISP. AEMO does not assess the risk of such an increase and the resulting option value of waiting until we have better cost information, which could be high given the history of transmission cost increases.

- Making HumeLink actionable now permits TransGrid to commence early works, which AEMO estimates will cost $330 million. In the Draft ISP, AEMO focusses on the $20 million option value analysis. Another way of asking consumers about risk preferences would be to ask whether they are prepared to fund $330 million in early works as insurance against these risks. There is no evidence that AEMO has asked consumers this critical question. We discuss the appropriate scope and cost of early works further in section 3.6.2 below.

AEMO does not provide clear evidence as to why it considers that this approach would best align with consumer risk preferences. AEMO did not consult with us on this issue prior to the Draft ISP and we are not aware of AEMO having engaged with consumers to understand their risk preferences or test whether this approach is consistent with those preferences. We expect that consumers would have a range of different views on this issue if they were consulted on it and given information to assist them to make an informed decision. We recommend that AEMO undertakes additional consultation with consumers on this prior to the final 2022 ISP.

### 3.6.2 Early works and decision rules for actionable ISP projects

The Draft ISP makes 3 projects fully actionable – New England REZ, Sydney Ring and Marinus Link.

It takes a different approach to VNI West and HumeLink, which it makes actionable with staging. Under this approach the entirety of each project becomes an actionable project, but these projects are to proceed in stages.

The relevant TNSPs are to commence stage 1 now, which involves 'early works'. AEMO defines early works for HumeLink as follows,[65] with a similar definition for VNI West:

- *Project initiation – planning and design activities needed to accurately define the project, including pre-contracting activities for engineering, procurement and construction contracts such as obtaining binding bids.*

[65] Draft ISP, p66.

- *Stakeholder engagement – with local communities, landowners and other stakeholders.*
- *Land-use planning – identify and obtain all primary planning and environmental approvals, route identification, field surveys, geotechnical investigations, substation site selection, easement acquisition and preparation of option agreements with landowners.*
- *Detailed engineering design – transmission line, structure and substation design, detailed engineering design and planning.*
- *Cost estimation – finalisation, including quotes for primary and secondary plant*

Upon completion of early works, the TNSPs may implement the full project provided certain 'decision rules' have been satisfied. The decision rules for HumeLink are as follows, with similar decision rules for VNI West[66]:

> *After completion of Stage 1 (early works), the HumeLink project is to progress to Stage 2 (implementation) unless any of the following occur:*
>
> *(a) there are new commitments that increase the likelihood that either:*
>
> (i) *material volumes of existing dispatchable capacity are retained in New South Wales; or*
>
> (ii) *material volumes of new dispatchable capacity are developed in New South Wales beyond what is currently assumed in the Step Change scenario, or*
>
> *(b) the total project cost (including the cost of completed early works) has materially increased from the current cost estimate of $3.3 billion.*

We support *the concept* of early works and *the decision* by AEMO to make early works for HumeLink and VNI West actionable. Efficiently implemented, early works can be expected to play an important role in reducing uncertainty and managing the risks to consumers of both under and over-investment:

- They help manage the risk of under-investment by starting work on these projects now so that they can be implemented more quickly if circumstances change and they are needed sooner than originally expected.
- They help manage the risk of over-investment by spending some money now on community engagement, route selection, detailed design and cost estimation. Undertaking that work now should help provide much greater certainty of future costs and benefits before making a final decision, to progress with the project and incur the much larger full costs (through the 'feedback loop' process). This involves an initial cost

66 Draft ISP, p66.

for consumers now, but reduces the risk of cost blow-outs at a later stage and enables more informed decision-making.

However, we have some concerns about the very large cost of early works for HumeLink and VNI West, the lack of a break-down of these costs and the limited consultation undertaken by AEMO with consumers on these costs. Consumers are being asked to fund $330 million of early works for HumeLink (10% of the current forecast total cost) and $491 million for VNI West (17% of the current forecast total capex). There is no explanation of why such a large amount is needed or what consumers get in return for this investment, other than the 5 bullet points above. It is therefore unclear how consumers can be confident that this investment represents prudent risk management.

We fully support early works that will improve community engagement and enable more accurate cost estimates to be prepared for the final decision. However, we are not yet convinced that the full scope of early works as set out by AEMO is justified. We recommend that AEMO works with the relevant TNSPs to provide more detailed estimates of early works and publish this information in the Final ISP. Consistent with our previous submissions on transmission costs, all TNSPs should be required to provide cost estimate data in a form that allows AEMO to interrogate it and transparently consult on it.

The scope of early works may differ among projects and AEMO should provide a justification for a particular scope. For example, AEMO should explain why and when it is in consumers' interests to include the acquisition of land easements or options as part of early works. If the project ultimately does not pass the decision rules, considerable unnecessary costs may have been incurred on land acquisition that could have waited until stage 2.

Early works of this scale is largely justified by AEMO's view that these projects are definitely needed, and it is just a case of 'when' and not 'if' they are needed. On that basis, from a consumer perspective, the costs of early works will not be wasted if the decision rules are not met and the optimal timing of the project is delayed. This situation would lead to a small cost to consumers from having invested too early, but not a large cost of having funded work that is not needed at all.

AEMO has provided a clear demonstration of why MarinusLink is needed at some time in the near future in all scenarios. However, AEMO has not set out in sufficient detail how it has reached the conclusion that it is just a question of 'when, not if' VNI West and HumeLink are needed. AEMO should provide further information on this issue. In particular, AEMO has not clearly explained what factors could lead to these projects not being needed at all, or could lead to a major delay in when they are needed. For example, it would be useful for AEMO to explain what impact a 30% or 50% increase in transmission costs would have on the optimal timing of

these projects and what the resulting cost to consumers would be from having funded early works too early (eg financing costs and work that needs to be redone).

We also recommend that AEMO provides clearer decision rules in the final 2022 ISP. For example, the decision rules refer in several places to 'material' changes or 'material' cost increases, but do not define what constitutes 'material'. This recommendation is consistent with a recommendation made by the AER in its Transparency Review report.

Consistent with the discussion of capital cost estimation risks at Section 2.2, the Panel supports using the early works stage to constrain the uncertainty of cost estimates. Unfortunately, there is no requirement on what 'class' of costs estimates the early works expenditure should result in.[67] Given the proposed early works for HumeLink and VNI West involve expenditure of $821 million, we consider that consumers should have confidence in the revised capex estimates at the end of these early works. To achieve this outcome, we would support AEMO exploring further the idea presented by AEMO at the Consumer Engagement session on 25 January that "early works can advance a complex project from [an AACE] class 4 to class 3 or class 2 (with exceptions)." AEMO should consider whether it is possible to incorporate requirements regarding the class of cost estimates for stage 2 of the projects as part of the decision rules.

Shortly following publication of the ISP, TransGrid applied to AEMO on 25 January 2022 seeking written confirmation that its cost estimate for the early works for HumeLink satisfied the ISP feedback loop. On 27 January 2022, AEMO published its decision that TransGrid's cost estimate for the early works for HumeLink satisfies the ISP feedback loop.[68] This feedback loop decision enables TransGrid to satisfy the triggers for a contingent project application to the AER for funding for these early works.

In the Draft ISP, AEMO set out its draft views on the appropriate approach to staging HumeLink and the appropriate scope of early works. However, our understanding is that the effect of AEMO's decision on TransGrid's feedback loop request is that the staging approach and scope of early works set out in the Draft ISP is now locked-in with no scope for AEMO to make

---

67 This terminology comes from the AACE description of cost classes. The AACE Guideline recognises the complexities of large scale transmission projects in obtaining social licence approvals. The AACE has a cost category 'Class 2 with exceptions' for projects where the 'stage gate' is required by regulators that set tariffs based on network capex. This would involve consideration of what should be completed at the end of early work regarding route selection and social licence, apart from legislated environmental/biodiversity obligations.

68 See https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/integrated-system-plan-feedback-loop-notices

changes based on stakeholder feedback to the Draft ISP. If so, that appears to be a significant weakness in the ISP framework.

AEMO should clearly explain the implications of this feedback loop decision in the Final 2022 ISP. If our understanding above is correct, then in future ISP processes AEMO should undertake thorough consultation on these types of issues *prior to* publication of the Draft ISP or an ISP Update to avoid a repeat of such a situation.

#### 3.6.3 Preparatory activities for future ISP projects

Another tool available to AEMO to reduce uncertainty is to require the relevant TNSPs to undertake 'preparatory activities' for future ISP projects. This enables the TNSP and AEMO to obtain more accurate information as to the likely benefits and costs of these projects so AEMO can make a more informed decision whether to make these projects actionable in the next ISP.

Preparatory activities could include stakeholder and community engagement, detailed engineering design, route selection, cost estimation, preliminary assessment of environmental and planning approvals. Preparatory activities are smaller and lower-cost than early works, but have a similar purpose.

In the 2020 ISP, AEMO triggered this work for projects that it considered might become actionable in the 2022 ISP. In the Draft 2022 ISP, AEMO did not set out a draft decision on which additional projects should undertake preliminary activities. AEMO will determine this issue in the final 2022 ISP.

We support preliminary activities as a useful tool for managing uncertainty. We consider that preliminary activities will be valuable for any projects that AEMO considers may become actionable in the 2024 ISP, and potentially also for some other longer-term future projects that have significant social licence issues or high levels of cost uncertainty.

#### 3.6.4 REZ design reports

REZ design reports are a new part of AEMO's ISP toolkit. They explore the technical, economic and social barriers to unlocking REZs and are an important step in improving how social licence is incorporated in transmission planning decisions. These reports can be triggered in the final 2022 ISP for REZs that require coordination of both generation and transmission infrastructure within 12 years and have the support of the Minister for the relevant jurisdiction.

In the draft ISP, AEMO recommends REZ design reports for 9 REZs in SA, Tasmania, Queensland and Victoria. No REZ Design Reports are recommended for NSW on the basis that similar activities are already underway by the NSW government under its own REZ framework.

Although this involves a considerable amount of work and will involve some costs for TNSPs (and therefore consumers) we support this proposed use of REZ Design Reports. They will make a useful contribution to stakeholder and community consultation, understanding social licence risks and improving cost estimates, noting that a range of other tools are also needed to address those challenges.

In the context of the risks of over or under investment, our view is that – conducted well – REZ Design Reports will reduce uncertainty and contribute to securing social license faster than would otherwise be the case. On this basis, REZ Design reports should reduce risks of both over and under investment and hence promote the long term interests of consumers.

#### 3.6.5 The potential role of government or third party funding

The ISP recognises that third party funding could play an important role in responding to uncertainty.

AEMO has sought to identify an ODP that best promotes the long term interests of electricity consumers, including transmission projects that should be made actionable projects and funded by consumers through regulated charges. However, it has acknowledged that there may be reasons why some stakeholders would prefer that certain projects be progressed sooner than the timeframes that are justified under an assessment of the net benefit to electricity consumers. For example, governments may have a different view as to the relative weights to apply to the risks of under and over-investment and how to manage uncertainty.

The ISP usefully sets out the role that funding from a third party (governments or others) could play in accelerating projects if the third party considered there was other value in providing such funding. If governments or others partly funded a project, that would reduce the costs required to be funded by consumers and improve the net benefit under AEMO's cost-benefit assessment.

As an example of this risk management approach, AEMO sets out in the Draft ISP the size of government funding that would be required for AEMO to recommend proceeding with each of VNI West and HumeLink without staging so as to accelerate their delivery dates.

For example, in relation to HumeLink, AEMO states:[69]

> *there may be good reasons why third parties would like to see this project progressed unconditionally for delivery in 2026-27. A third party funding commitment of $330 million to $370 million (just over 10% of the project cost) that is conditional on the project progressing to*

[69] Draft ISP, p78.

*schedule would result in CDP11 with HumeLink actionable without staging being the equal-highest ranked CDP*

Similarly for VNI West, AEMO states:[70]

> *there may be good reasons why third parties would like to see this project progressed unconditionally for delivery by or before 2030-31. A third party funding commitment of approximately $500 million (just under 20% of the project cost) would result in CDP2 with VNI West actionable without staging being the equal-highest ranked CDP*

We support the inclusion of this analysis and encourage governments to consider what role government funding could have in reducing the risks to electricity consumers of these major investments.

### 3.7 Key residual risks – Social license & Supply chains

We consider that there are two extremely significant sources of uncertainty (and hence risks) that remain after the application by AEMO of the various tools discussed above: social licence issues and supply chain risks discussed in sections 2.5 and 2.6 above. Importantly, these are both not only 'Implementation Risks' but 'externalities' to the energy markets.

AEMO acknowledges these risks in the Draft ISP and states:[71]

> *However, some important considerations may still risk the Draft ODP's timely implementation:*
>
> - ***Securing social licence for VRE, storage and transmission**. This Draft ISP shows how the NEM can optimise consumer benefits while supporting government policies for emissions reduction and Australia's new net zero target. However, the land needed for major VRE, storage and transmission projects to realise these goals is unprecedented. Early community engagement will be needed to ensure investments have an appropriate social licence. The new REZ Design Report framework is a start, but proactive engagement and integrated land-use planning is also needed at a jurisdictional level. In some cases, this may lead to alternative developments that reduce the need for new transmission, including batteries, gas-fired generation and offshore wind developments that connect to the existing network easements.*
> - ***Project sequencing to manage supply chain risks.** There is strong industry consensus on the acceleration in global infrastructure and renewable energy investment over the next two decades. This will significantly increase demand for expertise, materials, and equipment,*

---

70 Draft ISP, p78.

71 Draft ISP, p15.

*putting pressure on costs and schedules for new NEM generation and transmission projects. Development optimisation through the ISP process alone cannot fully secure the strategic sequencing of projects to manage supply chain risks.*

Early works, preparatory activities, REZ design reports and improved consultation with a wider group of stakeholders on the development of the ISP can help manage social licence issues, but they remain a key risk. We recommend that AEMO puts more emphasis on this issue – and takes a leadership role amongst the many stakeholders that will need to be involved - as it plans the development of the 2024 ISP.

Supply chain risks related to multiple projects also have the potential to be a material risk to the delivery of the ODP. We encourage AEMO to consider how to better assess this risk as part of the CDPs assessed in the development of the ODP for the 2024 ISP. We note that the Infrastructure Investment Objectives Report for NSW REZs that was prepared by AEMO Services as NSW Consumer Trustee in December 2021 more explicitly considers this risk as part of its assessment criteria and expressly assesses how effectively alternative development paths manage that risk. The ISP does not currently do so. The Panel fully supports AEMO considering this risk in more detail in the 2024 ISP

# 4 AEMO's engagement with consumer and community stakeholders in developing the Draft ISP

## 4.1 Background

Our assessment of the effectiveness of AEMO's engagement with consumer stakeholders in developing the IASR and ISP Methodology was laid out in some detail in our IASR report. [72] AEMO responded to each recommendation in Appendix 1 to the Draft 2022 ISP.

We acknowledged that engaging stakeholders is already a key priority in AEMO's recently published FY22 corporate plan, in which AEMO says it aims to be "a trusted partner that puts our members and stakeholders at the centre of everything AEMO does".[73]

Further, we fully support the public statements made by AEMO's new CEO in a recent speech that " in order to maximise the benefits of this energy transition for the whole of society, all of us need to play our role and work collaboratively, together, and learn from one another",[74] and we are encouraged by his leadership and commitment to "greater openness, transparency and accountability for the interactions we have with all our stakeholders as we go about our work".

We acknowledge that AEMO made improvements to the consumer forums following the feedback from consumer stakeholders and sought to address the lack of resources to prepare written submissions. AEMO held a number of sessions focused on providing a targeted briefing and clarification on issues of interest to the consumer stakeholders with the support of the Panel.[75]

The recommendations below are complementary to the engagement recommendations in our IASR Report and are targeted at the material risks outlined in previous chapters including the two new high-priority NEM challenges being social license issues and supply chain pressures.[76]

## 4.2 Acknowledgment of First Nations

The Panel acknowledges the many First Nations that host Australia's electricity grids and pay respect to Elders past, present and emerging. We are conscious of the landscape-scale impacts of the energy transition and wish to emphasise the importance of engaging further with traditional owners as the grid seeks to expand.

---

72 Available at https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/get-involved/consumer-panel

73 See fy22-aemo-corporate-plan.pdf

74 See https://aemo.com.au/newsroom/news-updates/the-view-from-the-control-room

75 See Draft 2022 ISP Appendix 1, Stakeholder engagement

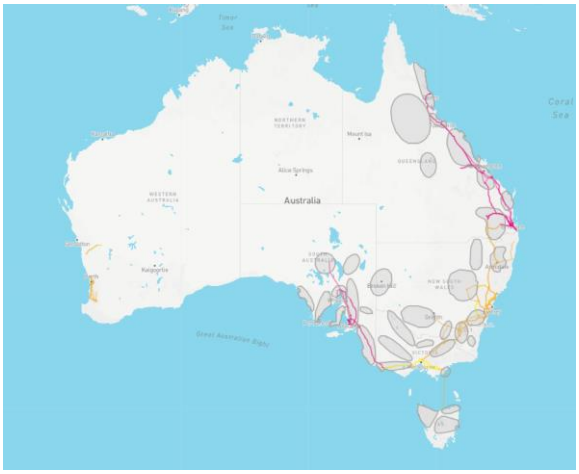
76 Draft ISP, p22.

It is also important to acknowledge that there are economic opportunities: [77]

> *Given the opportunity that the energy transition provides to Indigenous communities and businesses byway of being an integral stakeholder in the buildout of renewable energy assets, and given the continued expansive role of governments in interventions into electricity supply to support renewable energy assets, it would be another missed policy opportunity to not focus on how these barriers are effectively dealt with.*

In further recognition of this potential, we encourage AEMO to include overlaid maps of the Networks and Renewable Energy Zones with the AIATSIS Map of Indigenous Australia[78] in the Final ISP.

The AIATSIS map of Indigenous Australia is available at:
https://aiatsis.gov.au/explore/map-indigenous-australia




## 4.3 Build a community of practice around the ISP and its inputs

We see a key role of the Panel as working with AEMO on building support for, and confidence in, the ISP process. However, the complexity of the ISP development process can make it very difficult for consumers to understand and engage in the ISP process, and this impacts the ability to build consumer confidence in the findings.

### 4.3.1 Help consumers express their risk appetite

Treating the ISP as a Risk Assessment process that runs every 2 years requires a process of inquiry for consumer and community stakeholders that can develop and refine risk criteria for application to specific risks or specific actionable projects.

To this end, the Panel recommends AEMO consider how it can support a diverse 'community of practice' of consumer stakeholders able to participate in risk assessments and risk

---

77 In a recent example: James Reynolds, "Energy Transition can be an Indigenous economic opportunity" Australian Financial Review 7th February, 2022

78 https://aiatsis.gov.au/explore/map-indigenous-australia

evaluations. We acknowledge that the capacity to effectively engage is also a constant challenge for many and encourage AEMO to partner with Energy Consumers Australia and governments to build this capacity.

In order to move along the IAP2 engagement spectrum[79] AEMO will need to build deeper understanding of the ISP amongst consumer and community stakeholders so they are able to engage more confidently and participate in the decision making. Immediate opportunities for AEMO would include learning & development forums targeted to consumer & community stakeholders e.g., training on access and use to the Forecasting Portal and other resources.

#### 4.3.2 Suggestion: Targeted Risk Assessments

The following is an **example** of how framing the ISP as a risk management tool might help consumer stakeholders build confidence in the ISP. The proposed approach is to conduct targeted Risk Assessments around the particular areas of concern.

A lack of confidence in the ISP's consideration of the role that DER could play is something that has been raised with us by a number of stakeholders. Similar approaches could be taken with other priority areas such as the approach to coal closures or the future role of reticulated gas.

Our suggestion is for consumer stakeholders with an interest in this as a priority category of risk could be invited into a Risk Assessment process to form a view on the balance of risks managed by the Draft ISP. The process should really be co-designed with participants but for the sake of example the 'issue' could be reframed in terms of risk as something like:

- There is significant uncertainty in not only the capacity of DER that will connect to the NEM over the planning horizon but also in the capability to respond remotely to market signals of that DER.
- There is a risk of overinvestment in the shared transmission network if the modelling underestimates the role of DER (and hence overestimates the need of the shared transmission network to deliver electricity from the REZ to the load centres)
- There is a risk of underinvestment in the shared transmission network if the modelling overestimates the role of DER, and has not triggered enough investment in the capacity of the shared network.

Our understanding is that most of the concern is around the risk of overinvestment. The 'inform' phase of the Risk Assessment process would aim to inform participants views on the relative probability and consequences of the drivers of uncertainty and the cost of 'getting it wrong' -

---

[79] See https://iap2.org.au/resources/spectrum/

informed by an understanding of technology uptake projections and how they map to the scenarios in AEMO's forecasting work. This would also include an understanding of what's possible and building confidence that the modelling is considering the plausible range of outcomes of the power system.

Co-designed deliberative decision-making techniques – and traditional risk assessment tools such as probability and consequence analysis - can then be used to test whether the investments proposed by the Draft ISP would satisfy – or violate - the risk appetite of individual participants. This sort of technique would also acknowledge existing 'risk treatments' and identify opportunities for other actions that would reduce the uncertainty over time. As described in relation to Coal retirement uncertainty, there are – and should be – other risk treatments available than accelerated network expenditure.

### 4.4 Engagement Priorities from now to June 30

The CBA Guidelines state that when selecting the ODP, AEMO is required to:[80]

> *Use professional judgement in balancing the outcomes of the above decision making approaches … and explaining … why the level of risk neutrality or risk aversion chosen is a reasonable reflection of consumers' level of risk neutrality or risk aversion*.

The ISP Methodology also refers to transparency around the risk 'tolerance' of consumers:[81]

> *Recognising potential regrets is important in the ISP because uncertainty and consumers' risk tolerance need to be understood and considered. In some future circumstances, the risk of high future costs may be significant with particular investment combinations, and outweigh the potential benefits of these investments if these circumstances eventuate**. Where investments are identified as having high risks**, the cost-benefit analysis must consider the risk tolerance of consumers to these events occurring, which may not be adequately captured by simply averaging across scenarios.*
>
> *These risks can occur for both under- and over-investment – often the lack of investment can have higher risks associated with reliability than over-investment. As such, the CBA approach must consider regret costs that consider consumer risk tolerance in a transparent manner*.

In our view, the focus of engagement prior to the Final 2022 ISP should be on testing the assumptions around the risk preferences of consumers used in HumeLink and VNI West.

Our specific recommendations are presented as Group F in the Recommendations Table.

---

80 AER, CBA Guidelines, p27

81 AEMO, ISP Methodology, p71

# 5 Distributional impacts

## 5.1 Background

According the AER's CBA Guidelines, AEMO should also present information on key distributional effects, even though distributional effects should not influence AEMO's choice of optimal development path.

The Guidelines define ***Distributional effects*** as: [82]

> *Distributional effects consider the distribution of costs and market benefits of an optimal development path – that is, who receives the benefits and who pays the costs.*

The Draft 2022 ISP did not include any specific information in this regard other than to say "*Distributional effects of the ODP*" will be included in the Final ISP in June:[83]

> *The distribution of benefits of the ODP is unlikely to be uniform to all consumers in all regions. AEMO identified in the ISP Methodology that detailed short-term modelling would be deployed to evaluate these effects, including consumer bill impacts and transmission network charges. This analysis will be conducted for the final ISP, in accordance with the AER's CBA Guidelines.*

AEMO has flexibility over what information to present for key distributional effects, but the AER Guidelines consider key distributional impacts include how the costs and/or market benefits of the optimal development path (or actionable ISP projects) are distributed across:

- NEM regions
- customer types (for example, residential and business)
- participants in the market (e.g. producers, transporters and consumers of electricity).

The CBA Guidelines also state that since Cost Benefit Analysis (CBA) is:[84]

> *focussed on efficiency and aggregates costs and benefits across individuals/entities without regard to the equity of the distribution of those costs and benefits … CBA cannot resolve equity issues. However, it can draw attention to them through considering distributional effects, and allow policy makers the opportunity to address these through government.*

---

82 AER, *Cost benefit analysis guidelines*, August 2020, p35.

83 Draft ISP, p97.

84 AER CBA Guidelines, p35.

The CBA Guidelines state that key distributional effects could also include:[85]

- *how the costs and/or market benefits of the optimal development path (or actionable ISP projects) are distributed across different types of generators/ developers, possibly informed by indicative wholesale market pricing impacts*
- *estimated customer electricity bill impact (or impact on transmission charges) of the optimal development path (or actionable ISP projects) – similar in concept to those the AER provides for its revenue determinations.*

## 5.2 The Panel's Recommendations

As outlined at Section 4.3.1, effort is required to help consumer stakeholders express their risk 'appetite' or 'preferences'. The obligation to explore distributional impacts can be seen as an important opportunity to inform stakeholders as they develop an understanding of their risk preferences.

For example, it has been apparent to us from engagements to date that some divergence of views occurs depending on whether that view is coming from a more residential perspective compared to a more business or economy-wide perspective. This is certainly an area of distributional impact where more information might assist the expression of risk preferences.

In the Panel's view, distributional impacts that would inform the thinking of community and consumer stakeholders, policy makers and investors are:

- Bill impacts – residential, small business and large customers
- By state and territory
- Intergenerational impacts, eg how will the bill impacts vary over time and what proportion of the costs will be borne by current vs future customers
- The incidence of costs and benefits between electricity consumers and Hydrogen exporters from funding augmentation of the shared network to provide renewable electricity supply for the production of Hydrogen for export.

This is certainly not an exhaustive list and we encourage AEMO to ask other stakeholders directly.

[85] AER CBA Guidelines, p34.

## APPENDIX A: ISP AND CONSUMER PANEL FUNDING

### Dr. Andrew Nance (Chair)

Andrew is one of South Australia's most widely experienced energy specialists. He in an electrical engineer with a PhD in Energy Policy that has served on the AEMC's Reliability Panel, the AER's Consumer Challenge Panel and, until late 2021 chaired SA Power Networks' Consumer Consultative Panel and Connections Working Group. Andrew's day job is as co-Director of energy consultancy The Energy Project Pty. Ltd.

### Stephanie Bashir

Stephanie is a well-known industry leader, with more than 18 years of commercial experience in complex and matrix-style environments. Stephanie has held energy sector leadership roles in technical, commercial, strategic, policy, advisory and engagement; with expertise in energy market policy and regulation, new energy technologies and service innovation, grid modernisation and electric vehicles. She is the Founder and Principal of Nexa Advisory, and previously led the policy vision and strategy at AGL Energy in relation to new energy technologies & services.

### Gavin Dufty

Gavin has over 30 years of leadership experience in community welfare and advocacy, along with a comprehensive understanding of consumer protection issues related to energy and water. He has participated in multiple high-level forums and working groups including the AEMC Reliability Panel and has contributed to the development of Victorian Retail Code and the National Consumer Energy Framework. Current board member Energy Consumers Australia and the Energy and Water Ombudsman Victoria

### Mark Grenning

Mark is an experienced energy consultant with a focus on the medium to large consumer side. After a 30-year career with Rio Tinto with particular focus on electricity and gas supply to operations around the world, his work now includes being the Director of Policy and Regulation for the Energy Users Association of Australia. He was a member of the Australian Energy Regulator's Consumer Challenge Panel from 2016-21.

### Richard Owens

Richard has over 20 years' experience as a regulator, policy maker and adviser to regulated businesses. He brings unique experience and insights from having led the development and application of utility regulation and policy at senior levels across a range of regulated industries including electricity, gas, telecommunications, water and ports. He is currently a director at farrierswier, where he provides policy and regulatory advice across a range of regulated utility sectors. He is also an Associate Commissioner of the Utilities Commission of the Northern Territory. He previously held senior roles at the Australian Energy Market Commission overseeing AEMC rule changes and reviews and engagement with stakeholders.

## Funding Transparency Statement

Members of the ISP Consumer Panel are paid by AEMO from the funding it receives for the role of National Transmission Planner (NTP) [86]. This funding comes from the main transmission businesses (one per state) who, in turn, collect it from their customers as regulated charges. So, like Energy Consumers Australia, we are funded by consumers through market charges.

AEMO has an operating budget for the NTP role (Delivering an actionable ISP) of around $17 million in 2021-22. Just how much of the NTP budget is allocated to stakeholder engagement and the ISP Consumer Panel is controlled by AEMO. The total Consumer Panel allocation in 2021-22 is around 1.5% of the $17.2 million recurring ISP budget.

We are remunerated on a $/day basis (up to a cap on total days) at a rate that was similar to that paid by the AER to its Consumer Challenge Panel in 2020 and Consumer Reference Group members. Without disclosing actual rates, hourly rates for ISP Consumer Panel members are significantly less than the "Officer/Intern" charge out rates published for 2021-22 in the table below:

A1.4 AEMO charge-out rates

**Table 35 AEMO charge-out rates**

| Market | 2021-22 | Basis |
|---|---|---|
| Senior Leadership | 500 | $ per hour |
| Manager/ Specialist | 420 | $ per hour |
| Principal | 335 | $ per hour |
| Senior | 295 | $ per hour |
| Analyst/ Engineer | 275 | $ per hour |
| Officer/ Intern | 235 | $ per hour |

86 The National Electricity Rules were amended in 2020 to re-allocate recovery of AEMO's National Transmission Planner (NTP) costs from Market Customers (i.e Retailers) to Transmission Network Service Providers (TNSPs), effective from 1 July 2020 See https://www.aemc.gov.au/rule-changes/reallocation-national-transmission-planner-costs

## Regulatory Framework

Requirements under the Rules: NER clause 5.22.7



### 5.22.7 ISP consumer panel

(a) In respect of the preparation of an *Integrated System Plan*, *AEMO* has the function of establishing and supporting a panel ("**ISP consumer panel**") to provide written reports to *AEMO* on:

(1) the Inputs, Assumptions and Scenarios Report that will be used to prepare a draft *Integrated System Plan*; and

(2) the draft *Integrated System Plan*,

(each a "**consumer panel report**").

(b) The ISP consumer panel must consist of at least 3 members appointed by *AEMO*, who have qualifications or experience in a field *AEMO* considers relevant to the assessment of the *Integrated System Plan* and who have experience representing consumer interests.

(c) Prior to appointing members to the ISP consumer panel, *AEMO* must publish an expression of interest for persons to apply to become a member. The expression of interest must include:

(1) the terms of reference for the ISP consumer panel; and

(2) information about the requisite qualifications and experience required to become a member.

(d) The ISP consumer panel:

(1) must, in accordance with the terms of reference, give a consumer panel report to *AEMO* within two months of *AEMO* publishing the Inputs, Assumptions and Scenarios Report and draft *Integrated System Plan* respectively;

(2) must, in preparing the consumer panel report have regard to the long term interests of consumers; and

(3) may carry out its activities, including the giving of a consumer panel report, in the way it considers appropriate but must seek to give the report by consensus.

(e) A consumer panel must:

(1) include the ISP consumer panel's assessment of the evidence and reasons supporting the Inputs, Assumptions and Scenarios Report or draft *Integrated System Plan* respectively; and

(2) state whether the report is given by consensus.

(f) *AEMO* must publish a consumer panel report on its website.

(g) *AEMO* must have regard to a consumer panel report but is not obliged to give effect to any recommendations in a consumer panel report.