AEMO responses to Questions on Notice from Deputy Chair, Senator Karen Grogan

Senate Select Committee on Energy Planning & Regulation in Australia

27 November 2024

Question one

Mr Hargreaves, IPA – I particularly note an organisation that I once worked for as a contractor, which was NEMMCO, morphed into AEMO, which has now taken on all sorts of central planning functions for which it seems to be very ill suited. We seem to have a textbook example of provider capture, which is an economic concept which seems very relevant here. When you have provider capture, it's the consumers who lose.

Mr Wilson, IPA – I think there's a higher-level question here, and Scott may want to give some comments on this. I think the question is whether AEMO is truly independent. Is its role independent of government or not? I had understood it was intended to be, but I think that is an open question now.

Answer

AEMO is a company limited by guarantee incorporated under the *Corporations Act*. Federal and state governments agreed to establish AEMO in its current form in 2009. AEMO's membership is shared between government, federal and state (60%) and industry (40%).

Governments have conferred statutory functions on AEMO under the National Electricity Law, National Gas Law and National Energy Retail Law.

AEMO's Board of Directors is the only decision-making body that is responsible for the performance of AEMO's statutory functions. In carrying out these functions, AEMO acts independently of governments and is required to comply with national energy legislation, including having regard to national energy objectives. Members do not have a role in the performance of AEMO's statutory functions.

The legislation includes a provision for Ministers to ask AEMO 'for information, a report or other services' however the Ministers cannot direct AEMO in the performance of its statutory functions.

AEMO is not accountable to any one Government or Minister. AEMO is accountable to the Energy and Climate Change Ministerial Council (ECMC).

Question two

Dr Barr, Electric Power Consultants – Then I to move on to AEMO and the integrated system plan. I've done a lot of plans in my day, and the integrated system plan rates very poorly, in my view. It's a generation and transmission plan with no real consideration given to distribution costs, to behind-the-meter solar and to behind-the-meter batteries. It claims to be a low-cost system, but how can they say it's a low-cost system when they don't look at total system costs?

Answer

The ISP sets out the lowest cost pathway for the needed generation, firming, and transmission to achieve current policy settings including transition to net zero by 2050. As stated in the 2024 ISP, it does not include the cost of commissioned, committed, or anticipated projects, consumer energy resources or distribution network upgrades.

The 2024 ISP forecasts a need to invest in $122 billion (net present value annualised capital costs to 2050) as set out below:

Component	Discounted present value from FYE 2025 to FYE 2050 ($ billion) in real 2023 July dollars
Flexible gas	3.15
Biomass	1.30
Utility-scale storage	7.71
Offshore wind	16.41
Wind	60.03
Utility-scale solar	14.78
Retirement costs	2.82
Network augmentations	16.09
Total	**122.29**

Consumer resources are included as inputs in the analysis with a range of levels of investment considered across the various scenarios. Investment in consumer energy resources (CER), such as behind-the-meter solar and batteries, are made by consumers for reasons other than minimising the cost of the system as a whole. For this reason, the 2024 ISP optimised utility-scale investments, and tested them against a range of scenarios and sensitivities with varying levels of consumer investment. This approach allows the ISP to test utility scale investments to ensure they would provide value to consumers across a range of potential futures, including a range of levels of investment by consumers.

Question three

Dr Barr, Electric Power Consultants – I've tried to have that consultation, and I've tried to contact them to organise meetings, which have been totally unsuccessful. I got so frustrated, at some point, that I made direct submissions to the chairman of the board of AEMO and all the board members. I got some response, but, fundamentally, I've been totally unsuccessful in the consultation process—not for want of trying.

Dr Bongers, Gamma Energy Technology – They are a very closed shop, in terms of how their model works

Dr Barr, Electric Power Consultants –

CHAIR – Dr Barr, you said you've corresponded—and I've seen your submission—on the draft ISP. You got no response back?

Dr Barr – No response at all.

CHAIR – And there was nothing in the consultation report about the points you made?

Dr Barr– No, and it follows a similar, more detailed submission in 2022. It's not the first time this has gone through, and I think they're missing an opportunity to get some really serious feedback.

CHAIR – You're not the only person the committee or I have spoken to who has made that point. I think the point is transparency may be one thing—accountability seems to be another.

Dr Barr, Electric Power Consultants – There's plenty of data out there, but AEMO don't seem to have any vision inside distribution networks for what they are lacking, particularly down in the low-voltage network. People think that the low-voltage network is the least-important part of the system—the bit that's in front of your house—it's actually the most important.

Answer

AEMO received Electric Power Consulting's submission to the Draft 2024 ISP on Friday February 16, 2024. AEMO acknowledged receipt of the submission in correspondence with Dr Barr, published the submission on 15 March 2024, and responded to the material issues raised in submissions in the 2024 ISP Consultation Summary Report.

AEMO similarly received submissions from Electric Power Consulting on the Draft 2020 and Draft 2022 ISPs. In every instance, AEMO published Electric Power Consulting's submission, and responded to the material issues raised in submissions in the relevant consultation summary reports:

- EPC submission to Draft 2022 ISP Submission
- 2022 ISP Consultation Summary Report
- EPC submission to Draft 2020 ISP Submission
- 2020 ISP Consultation Summary Report

Question four

Mr Katz, HumeLink Alliance – There are no costs associated or imposed on transmission network service providers such as Transgrid, who are proposing an overhead option with a high risk. Indeed, they are required to come up with the least cost alternative in terms of initial capital cost. They do not have to consider the losses both direct and consequential which come from strong winds, storms and bushfires. Broken Hill is still without power as we speak as a result of only moderately high winds destroying the overhead transmission line, which services the whole region of Broken Hill. This shows the danger of a system that favours the development of overhead lines as opposed to fully costed long-term assets.

Answer

The ISP is prepared in compliance with National Electricity Rules (NER) and the AER's Cost Benefit Analysis (CBA) Guidelines. In accordance with these rules and guidelines, the costs and benefits assessed within the ISP and the RIT-T are limited to "all those who produce, consume and transport electricity in the market" – except for changes in Australia's greenhouse gas emissions. Economic impacts beyond this scope are considered to be externalities which do not impact the cost-benefit analysis:

> *"AEMO is required to exclude from its analysis, the costs (or negative benefits) of an ISP project's harm to the environment or to any party that is not prohibited under a law, regulation or other legal instrument with the exception of changes in Australia's greenhouse gas emissions." – AER Cost Benefit Analysis Guidelines*

There are design standards that require infrastructure to be built to a given level of resilience, and there are reliability standards that require network service providers to plan for outages in their network (e.g. with network redundancy or backup supply). Transmission Network Service Providers maintain transmission tower and line design documents that consider the relevant Australian standards and the potential for extreme weather. The cost of meeting these standards, guidelines and laws is considered when planning new network projects.

AEMO consults on all network options in the ISP via the Transmission Expansion Options Report. AEMO considers the cost of construction, maintenance, and operation of each network option in the ISP, including compliance with engineering standards, laws, regulations, and administrative requirements. Further, preparation of this report for the 2024 ISP included specific consultation on the use and cost of undergrounding, which can be an appropriate approach to increase network resilience.

Finally, AEMO conducts a wide range of planning activities in addition to the ISP that contribute to planning for power system security and resiliency. This includes the annual System Security reports, the new Transition Plan for System Security, and the General Power System Risk Review (GPSRR).

Question five

Mr Woodley – My third issue concerns AEMO's increasing responsibilities, expanding far beyond its initial role as Australia's energy market operator. Today AEMO is also involved with forecasting, planning, transmission design, construction, contracting and regulation, creating a number of potential conflicts of interest. AEMO has also moved from being an independent entity that provided information and alternative scenarios to being a fervent promoter of its ISP optimal development path. Whilst its intentions are in the right direction, the physical delivery of such extraordinary quantities of VRE storage and transmission in the step-change scenario are simply impossible, and its resolute advocacy raises unachievable expectations, increases construction costs and creates unhelpful tensions.

Mr Woodley – Finally, I review the transmission cost blowouts, cost apportionment and future design. I refer to the underestimation of cost and construction timing of new transmission lines, citing HumeLink as an example, with a sixfold increase in cost in just four years to $5 billion. Obviously, there is an inherent incentive for transmission providers to underestimate cost to get their projects into the development stream. There is no prospect of the transmission projects in the ISP being completed in the timeframes or for the cost estimated. I then question the current practice of simply adding the cost of new transmission to the regulatory asset base to be borne entirely by consumers. For example, HumeLink alone will have increased New South Wales transmission tariffs by more than 50 per cent. The proposed generators ought to be paying their fair share of the cost of transmission so that the most economically efficient locations are chosen. I then comment on the dodgy cost-benefit analyses that are justifying new projects and conclude with the lack of genuine consideration of new technologies for the transmission system of the future. There's no consideration of undergrounding or DC.

Answer

AEMO's independence

AEMO is a company limited by guarantee incorporated under the *Corporations Act*. It is not an agency of any government, but it has Government Members comprising the Commonwealth and the States and Territories. AEMO is not accountable to any one Minister, but rather to a Council of Ministers known as the Energy and Climate Change Ministerial Council (ECMC).

The ECMC (and individual Ministers) can ask AEMO "for information, a report or other services", but they cannot direct AEMO in the performance of its statutory functions — which are the responsibility of AEMO's Board of Directors.

AEMO is also independent of market participants. Decisions relating to AEMO's statutory functions are the responsibility of the AEMO Board of Directors. A majority of the Directors, including the Chair, must be independent of business or other relationships that could materially interfere with their independent judgement. AEMO also has robust processes for declaring and managing potential conflicts on the part of individual directors.

Project timing and costs in the ISP

Please refer to AEMO's response to Question 8 (ISP development). AEMO consults on the lead time and cost for all transmission, generation, and storage options in the ISP.

HVDC transmission

AEMO consults on candidate transmission options in the Transmission Expansion Options Report. For the 2024 ISP, AEMO included several HVDC transmission options that were assessed, including:

- Southern Queensland to Central Queensland options 4 and 5
- Central New South Wales to Northern New South Wales (i.e. QNI Connect) options 2
- Marinus Link stage 1 and 2
- Broken Hill REZ expansion option 2
- Offshore wind connection

While AEMO makes conceptual design assumptions in the ISP, projects that AEMO identifies as actionable ISP projects will progress through the RIT-T. In this process, the Transmission Network Service Provider (TNSP) must consider a range of feasible network options to meet the identified need, including credible alternate designs or technologies, potentially including the use of high-voltage direct current (HVDC).

Question six

Professor Mountain – I'd like to focus my submission and my time here talking principally about the Australian Energy Market Operator's NEMLink vision, which is a 15-year-old vision for a 500-kilovolt super grid from Hobart to Townsville, essentially. Since they were created as an organisation, AEMO have pursued this. They stated it in their first document when they were created, and that's been their agenda. The essence of the vision is interconnection between the regional states. The argument for this in a fossil fuel dominated era was tenuous at best, based essentially on differences in the quality and cost of coal and gas. But as we move to carbon-free sources, whether nuclear, wind, solar or storage, no state has a cost advantage compared to the others, and the diversity of the availability of wind and solar resources simply cannot come close to justifying the physical cost of the infrastructure, even leaving to one side the enormous local environmental costs and impact on landholders. So I think the policy at its source and its economics is not well founded, and I don't believe that their analysis of it has been transparent, accurate and open.

… We found through the detail of that that we think it doesn't stack up, and we think major changes are justified in withdrawing AEMO's ability to be a central transmission planner. It was a mistake to give them that authority, and it also raises fundamental questions on the governance of AEMO overall and their roles in the market.

Professor Mountain – Once they've [AEMO] stated a vision, they risk a lack of credibility when they're seen to change it. They tie themselves in, and they lack the ability to respond to technology change. I think, in addition, their focus is parochial, partly by definition of the organisation. It doesn't have a mandate to look widely. It doesn't have a mandate to properly account for local environmental and landholder impacts. It can't do that sort of calculation.

Professor Mountain –

CHAIR – Given the importance of the NEM to Australia's productivity and the enormous contribution it makes to GDP, can you articulate why parts of the ISP, particularly the interconnectors that you're so familiar with, aren't economic in the pure sense? What elements of them ensure that they don't add an economic benefit to the NEM or to Australia?

Prof. Mountain – The essence of the argument is in a carbon-free electricity system—again, I stress, whether wind and solar supplemented by storage or nuclear; the essence of a carbon system—no state has a meaningful comparative advantage in production cost. The sun is not so incredibly much better in Queensland, on average, or in New South Wales, South Australia, Victoria or Tasmania as to justify the location of solar in one location and enormous transmission augmentation to ship it to the other states. In wind there's a little bit of a difference in Tasmania in the average productivity, but those differences are small and Tasmania is an outlier. Those differences amongst the states are small.

But, even more so, we've found through detailed investigation of both the wind resource and the way that wind producers respond to market prices that the correlation of their production is very high. You would only consider building a bridge if you could get produce from one side of the bridge to the other at a lower cost and if you could share the results of production on either side of the bridge. That's simply not the case here, and we've studied it at length. AEMO, every time they're challenged on this, are at sixes and sevens to explain it. The fundamentals simply do not get you there on the resource economics.

Professor Mountain – There is no plausible reason whatsoever to think of NEMLink as offering an economic advantage to the people of Australia that would justify its cost. We've found this going into the various details of the calculation. … This, for us, is the touchstone, and we've put this to AEMO. Their answer essentially is:

'We have the you-beaut model. We've spent a lot of time building it. We've got lots and lots of experts and we consult with lots of people in the process.' We have been part of that consultation, and our protests or criticisms have not actually been taken into account.

Answer

The 2024 ISP identifies material benefits for interconnector projects — which are projects that expand transmission flow capabilities between regions of the NEM.

As coal generation retires, new sources of renewable generation and storage will need to connect to ensure a reliable supply of electricity to consumers through current policy settings. Interconnectors support sharing surplus generation and storage between market regions, thereby minimising duplication of investments in firming capacity in each market region to support coincident peaks in demand and/or troughs in generation availability. Without further interconnector investment, a higher total investment across all market regions would be needed due to additional renewable generation, storage, and peaking gas-fired generation.

Based on the 2024 ISP, the most significant market benefits from interconnectors are comprised of:

- **Generator and storage capital deferral** – There is diversity in resources (e.g. wind generation) and electricity demand (e.g. due to variations in weather dependent consumption such as heating and cooling, and due to variations in time zones) across the NEM. Additional interconnector capacity allows generation and storage which is surplus to local requirements to be shared across the NEM, resulting in a lower requirement for capital investment in generation and storage to meet the reliability standard.

  While building new generation is generally a cost in the cost-benefit analysis, interconnector projects can expand the capability to connect renewable generation in areas of high-quality resources and can allow surplus energy to be shared across market regions. Therefore, there is an efficiency in the cost benefit analysis whereby developing interconnectors can lead to a reduction in the total capacity of renewable energy required (and the total capital expenditure) to meet consumer and policy needs.

- **Fuel cost savings** – With additional interconnection, less fuel is required (e.g. coal and gas) because renewable generation and storage can be shared during times of surplus availability.

- **Operating and maintenance cost savings** – With a lower investment in generator and storage capital (discussed above), there is a lower requirement for operating and maintenance due to the reduction in net generation and storage capacity.

- **Reduced need for other transmission investments** – Because interconnectors often pass through Renewable Energy Zones, the development of an interconnector can mean that less subsequent transmission is required to connect high quality renewable energy.

As an example, Project Marinus is a project to construct an interconnector to further link the Tasmanian and Victorian regions, which will support growing demands in the Tasmania region and in the mainland. Project Marinus Stage 1 and Project Marinus Stage 2 contribute roughly $571 million to the benefits of the Optimal Development Path (ODP).

The 2024 ISP assessed that developing Project Marinus avoids the investment and other costs associated with additional generation and storage in the mainland regions. This delivers benefits through avoided generator and storage capital costs, fuel costs, and fixed operating and maintenance costs. If Project Marinus did not proceed, additional capacity would be required to meet demand in the mainland. This includes higher

levels of onshore wind (around 1.4 GW by 2032–33) and utility solar, mostly in Victoria and to a lesser extent in New South Wales. Project Marinus would instead allow additional Tasmanian renewable generation to support the mainland regions. In addition, without Marinus, nearly 500 MW of additional deep utility storage capacity would be required in Victoria by 2037–38, increasing to 760 MW by 2044-45.

Question seven

Professor Mountain – AEMO have said on record several times that there will be no further augmentation after VNI West. We've scrutinised that. That's simply not the case. There will have to be substantial Victorian transmission upgrades of the 220KV networks to get production to the 500KV substations that they intend, just for Victoria to access the limited capability of the new interconnector.

Answer

AEMO prepares the Victorian Annual Planning Report each year, presenting a Transmission Development Plan for Victoria over the next ten years. The 2024 Victorian Annual Planning Report includes a range of augmentations, across Victoria, prior to and after the VNI West project. These augmentations are required to maintain reliable and secure supply and maximise benefits to Victorian consumers.

The scope of the VNI West project (as detailed in the Project Assessment Conclusions Report), or the current Transmission Development Plan for Victoria, does not include 220kV transmission upgrades in the Western and North-Western regions of Victoria.

Network connections from new generation or storage onto the new 500kV interconnector would be part of the generation or storage development which are developed on a commercial basis and are therefore not part of the transmission planning assessment or part of the VAPR.

Question eight

CHAIR – In your opinion, do you think AEMO are transparent and accountable?

Prof. Mountain – No; I don't think they are at all. AEMO have been given an actionable ISP, which makes them accountable essentially to themselves. The AER can dot the i's and cross the t's on what the transmission companies think will be the cost of the approved program, but AEMO have an absolute authority, and the rules have intended that. That's by explicit intention, which was not, I should stress, the recommendation of the Finkel review. That was not what Alan Finkel's review had said ought to happen. So the only effect of policy governance that one might have of AEMO is hoping that, through government's involvement on AEMO's board, it can have some sway. But the governance processes for there are highly imperfect. So a decision of substantial public policy content has no proper forum for policy accountability.

Answer

There are a number of accountability mechanisms in place for the ISP and AEMO's role.

Developing the ISP is one of AEMO's statutory functions. AEMO's Board of Directors is accountable for the exercise of AEMO's statutory functions.

Development of the ISP

The ISP is developed and consulted on in accordance with prescriptive requirements in the National Electricity Rules (NER) and AER guidelines. The Australian Energy Regulator (AER) reviews AEMO's compliance with AER guidelines in preparing the IASR, ISP Methodology and Draft ISP, and conducts a transparency review of the draft ISP to assess the adequacy of AEMO's explanations of its inputs and assumptions.

The NER establish a rigorous framework which requires transparency and extensive stakeholder consultation. In addition to consulting on the Inputs, Assumptions and Scenarios Report (IASR), the ISP Methodology, and the Draft ISP, AEMO has elected to publish the ISP economic model so that stakeholders can reproduce modelling outcomes.

The NER ISP framework is itself an outcome of rigorous consultation and review.

It takes around two years to develop an ISP. AEMO publishes a timeline for the next ISP within three months of the publication of the previous ISP.

- Year 1 – development of and consultation on inputs, assumptions, and scenarios (and review of the ISP methodology at least every four years).
- Year 2 – development of the final ISP, including consultation on a draft.

Stakeholders who have made a submission to AEMO in its preparation of an IASR, ISP methodology or draft or final ISP, may submit a written notice to the AER within 30 days of an ISP's publication to dispute whether AEMO has complied with the relevant NER requirements in preparing the relevant document.

ISP and the RIT-T

In an ISP, AEMO may identify an 'actionable ISP project' that meets an identified need as part of the Optimal Development Path (ODP): NER clause 5.22.6(a). After AEMO identifies an actionable project in the ISP, the relevant TNSP must complete a 'Regulatory investment test for transmission' (RIT-T) for the proposed project (except in limited circumstances set out in NER): NER clause 5.16A.3.

The RIT-T is a more detailed and comprehensive multi-stage cost-benefit analysis conducted in accordance with the NER and the AER's guidelines. The AER assesses the contingent project application submitted by the TNSP for a revenue determination in relation to the preferred option, which includes an assessment of whether the TNSP's proposed expenditure in relation to the preferred option is prudent and efficient.

Stakeholders may also dispute certain conclusions in a RIT-T conclusions report to the AER. More information about what matters can be disputed and how to lodge a dispute is detailed in Section 5 of the AER's RIT-T application guidelines: Regulatory investment test for transmission and guideline.

ISP consumer engagement

Under the NER, AEMO is also required to establish an ISP Consumer Panel. The Panel plays an important role in bringing a consumer-focused perspective to the development of each ISP. AEMO established the 2026 ISP Consumer Panel in April 2024 and engages with its Members on a continuous and ongoing basis, seeking advice and input on a range of matters related to the development of the 2026 ISP.

The ISP Consumer Panel is complemented by AEMO's Consumer and Community Reference Group (CCRG) who provide strategic insights and advice to AEMO on a range of energy issues related to AEMO's system planning, reforms, and operations. For more information on the 2026 ISP Consumer Panel and the Consumer and Community Reference Group, see the 2026 ISP Stakeholder Engagement Plan.

Question nine

Professor Mountain – There are a whole range of fiddles that AEMO have employed to get the result they want. One is the counterfactual. The second is splitting a common project into separate elements and counting the benefit against each. It's the Roman arch argument: the value of building the arch is the value of the trade across the bridge. Well, let's use the value of that trade to justify the first half of the arch and then the second half of the arch, and you've counted the same benefit against each.

AEMO would've had an assumption around pumped hydro costs, battery costs and battery entry, which would've had them saying, 'If we can't build VNI West, we have to locate pumped hydro in Victoria; therefore, we need to build VNI West so that we can access cheaper battery.' I should stress that, after we pointed out the folly of that argument, AEMO's CEO, at a conference, said that the value of VNI West was exporting rooftop solar from Victoria to New South Wales, which makes no sense at all. You can produce rooftop solar just as cheaply in New South Wales as you can in Victoria. So the various arguments, at different levels of the organisation, have changed over a large range of time.

Professor Mountain – When asked to justify, from first principles, their modelling results, I think that AEMO are at sixes and sevens. They can only go back to claims of a widely consulted process and a very complex model, which I should stress they don't run themselves. They hire others to run it. When you come back to the first-principles economics, which I think is the way to understand these things—big models are black boxes; there must be a rationale that's easily understandable—we should expect this in energy as we do in housing policy or health care. They haven't been able to give a clear answer on the first-principles economics.

Answer

AEMO undertakes a transparent and professional modelling process to deliver the ISP. This includes genuine and extensive engagement with stakeholders across a two-year period. AEMO publishes and consults on the methodology it uses to develop the ISP, and utilises PLEXOS® for modelling, which is generally regarded globally as a premier, energy modelling program.

AEMO builds, maintains, and runs the ISP models used to identify the optimal development path and its costs and benefits, and publishes the data tables and detailed information that are used as inputs to the model. While models may be used by consultants to develop various inputs and assumptions that form part of the IASR (e.g. CER or EV forecasts), AEMO does not engage third parties to run the models used to develop the draft or final ISP.

The ISP includes Take One Out at a Time (TOOT) analysis to provide transparency on the value of individual projects, but TOOT analysis is not used to determine the ODP, or which projects should be actionable (and should progress to delivery to meet power system needs).

In regard to VNI West the identified need for the VNI West project has remained consistent across the 2020 ISP (Appendix 3, p36), 2022 ISP (p74) and 2024 ISP (Appendix 5, p44). The identified need is to increase transfer capacity between New South Wales and Victoria market regions to release net market benefits by:

- efficiently maintaining supply reliability in Victoria following the closure of further coal-fired generation and the decline in aging generator reliability – including mitigation of the risk of existing plant closing earlier than expected,
- facilitating efficient development and dispatch of generation in areas with high quality renewable resources in Victoria and southern New South Wales through improved network capacity and access to demand centres, and

- enabling more efficient sharing of resources between NEM market regions.

These ISPs have identified the primary benefits of VNI West as avoiding higher levels of firming capacity by increasing access to Snowy 2.0, providing grid access to renewable energy zones, sharing variable renewables between market regions and additional resilience from interconnection.

ISP Counterfactual

The counterfactual development path allows AEMO to compare candidate development paths to a future without major transmission augmentation to calculate the economic benefits of transmission.

During the development of the 2024 ISP, AEMO considered over 1,000 potential development paths of new transmission investments combined with the generation, storage and CER developments needed, and narrowed them down to a shortlist of 25 candidate development paths. These candidate development paths incorporated all the transmission and other investments needed, and are compared to a 'counterfactual' for each scenario that had no new major network projects beyond those already committed or anticipated.

Question ten

Professor Mountain – All of the actionable projects that AEMO has put forward so far have been transmission projects. AEMO, itself—and this is in the very nature of it—is in a bit of cleft stick. It has difficulty putting forward a generational storage solution because it isn't in the contestable element of the market. So even though a storage solution is often the best solution to augment transmission capability, AEMO doesn't really have the mandate or the vires to be putting that forward.

Professor Mountain – The gist of the drumbeat on the successive ISPs has been AEMO saying: 'This is the optimal plan. Why is it not being developed? Government needs to get this going even more quickly, and the market needs to get it going even more quickly. This is the optimal plan, after all.' Instead, it should be reflecting on the fact that, with this optimal plan that we think is optimal, there's huge difficulty with the information that's being revealed for a whole range of reasons; the market isn't responding, and maybe that tells us that our plan is wrong.

Answer

Identifying non-network options

The vast majority of investment in the ISP relates to generation and storage investment opportunities. These types of investments are delivered primarily through market-based solutions and are not part of the actionable framework for regulated transmission which is part of the ISP clauses in the NER.

In every instance where AEMO identifies a new actionable ISP project, it requests submissions on the potential for non-network solutions to meet the identified need and explains its consideration of non-network options in the ISP, NER clauses 5.22.10(a)(5)(iv), 5.22.12 and 5.22.6(a)(6)(iv).

All “actionable ISP projects” are proposed investments that are required to complete the Regulatory Investment Test for Transmission (RIT-T). The RIT-T also requires TNSPs to compare different options, including non-network options, to identify the preferred option that will be proposed to the AER.

The ISP is the first economic analysis of a potential project.

It is followed by a RIT-T completed by the TNSP, which is a more detailed and comprehensive multi-stage cost-benefit analysis conducted in accordance with the NER and the AER’s guidelines. The AER assesses the contingent project application submitted by the TNSP for a revenue determination in relation to the preferred option, which includes an assessment of whether the TNSP’s proposed expenditure in relation to the preferred option is prudent and efficient.

Question eleven

Mr Morrison, Centre for Independent Studies – It is stated in the National Electricity Rules that the ISP must consider—'consider' being the key word—the emissions reductions targets as stated in the target statement. I put it to you now that there is just no way that we have a reasonable and natural interpretation of the word 'consider'. If I said to any of you here that I'd like you to consider my evidence, I do not expect you to then stop considering anybody else's evidence. I do not expect that you won't have challenges and test it and challenge it. If we were to switch seats, and perhaps we have a different government, and a new government said, 'We will have a policy of 82 per cent nuclear power by 2030,' would we just assume that that would by default happen, or should there not be some consideration of the plausibility of those types of things occurring? That is the essence of the deep flaw that AEMO have been hiding behind—or the worst flaw: their assumption that basically their document must reflect and considered to be perfect, considered to be accomplished, considered to be an infallible all-of-government policy.

A true interpretation of the word 'consider' would mean we need to absolutely model what it would look like but then consider challenges and act in the best interest of consumers to actually act out a rational and serious energy plan that would prevent serious risks for them. When we map out the consequence of plans, such as this recent plan that was commissioned partly by AEMO from the UTS on the workforce implications, and we see warnings like, 'Those occupations primarily needed for construction are very volatile with demand for electrical engineers rising threefold by 2029'—that is five years away—and then dropping below current levels in the late 2030s,' we need to start questioning: is this plan actually going to happen?

We have heard from other people, including the Australian Energy Council in their statement, that they believe, like we do, that AEMO has stated it is following the NER and that this precludes it from modelling such a scenario—talking about a baseline. In our view, this is incorrect. We also hold this view. This is a totally unnecessary, unnatural and perverse interpretation of the National Electricity Rules. In fact, it actually means they are not able to fulfil other elements of the rules, such as, in NER 5.22.10, the requirement that AEMO considers the risks arising to consumers from uncertainty, including investment, underinvestment and premature or overdue investment. If we only have one version of how this transition is going to play out in the scenarios, there is no way they can do that.

Moreover, the national electricity objectives now include emissions reductions, but they still include other objectives, too, such as price quality, safety and reliability. It was stated in the second reading speech when introducing the new national electricity objectives that the 'emissions reduction component is not intended to sit above or be prioritised over any other component within the objectives'. What AEMO has done in interpreting the consideration of the government emissions targets to become a binding constrain-all scenario has absolutely abrogated the principle that all of the different parts of the national electricity objectives be considered in conjunction.

Answer

The National Electricity Rules (NER) require AEMO to consider policies that are in the Australian Energy Market Commission's (AEMC) Emissions Targets Statement, and also allow AEMO to consider policies which meet criteria specified in the NER.

Emissions reduction targets in AEMC targets statement

AEMO must consider the emissions reduction targets in the targets statement as required by NER 5.22.3(b)(1). Emissions reduction targets are defined in the NER to mean targets set by jurisdictions for reducing greenhouse gas emissions or which are likely to contribute to reducing emissions. The targets

statement is structured to reflect these two categories of targets. The requirement for AEMO to consider the targets supports Australian governments' intention that the targets statement provides a publicly available, up-to-date list of government targets that decision-makers, including AEMO, must take into account at a minimum when having regard to achieving the emissions reduction element of the National Electricity Objective (NEO).

AEMO therefore includes all policies in the AEMC targets statement as inputs to the ISP's development, meaning the ISP modelling results will demonstrate collectively what is required in the NEM to meet these policies, for example, setting out the required generation, storage and transmission investments.

Other policies eligible to be considered

The NER allow AEMO to consider an environmental or energy policy that is not in the targets statement if:

- a commitment has been made in an international agreement to implement the policy;
- the policy has been enacted in legislation;
- there is a regulatory obligation in relation to that policy;
- there is material funding allocated to that policy in a budget of a relevant participating jurisdiction; or
- AEMO has been advised by the Ministerial Council of Energy to include the policy.

If AEMO assesses that a policy is eligible to be considered, AEMO's practice is to include these policies that may be considered under the NER alongside the targets in the AEMC targets statement, to ensure the ISP identifies an appropriate scale of investment requirements and power system needs that reflects the governments' aggregate policy positions.

ISP sensitivity analysis

In recognition of future uncertainties and risks in the transition of the NEM power system, AEMO conducts 'sensitivity' analysis to determine how modelling outcomes change due to a range of additional differences in the future outlook. Sensitivity analysis is separate to identification of the core planning scenarios used in AEMO's modelling, which represent a range of possible futures of how the NEM may develop to meet conditions that influence consumer demand, economic activity, decarbonisation, and other parameters.

In the 2024 ISP, AEMO identified and applied a range of sensitivities to the candidate development paths to test their resilience, and the relative impact on net market benefits (2024 ISP Appendix 6, pp 13).

Ultimately, sensitivity analysis allows AEMO to test the resilience of the Optimal Development Path to a range of uncertainties, above what is considered in the scenario narratives.

For example, in the 2024 ISP, AEMO applied a supply chain constraint as a sensitivity to test how supply chain limitations affect the rate of investment in generation, storage and transmission infrastructure. This analysis found that tight constraints may lead to renewable energy and emissions reduction targets being missed. Under this sensitivity analysis, the total renewable energy share would be only 68% by 2030, less than the 82% target, and NEM emissions would overshoot their 2024–50 carbon budget by approximately 109 million tons (Mt) CO2-e 35.

Question twelve

Mr Morrison, Centre for Independent Studies – We've given a very considerable submission on the topic of HumeLink. This is a project for which, in our opinion, there is absolutely no justification to advance at the current schedule. If the 82 per cent renewable energy target were not a binding constraint on all scenarios, it would not be advanced today. We know that with absolute certainty from page 61 at appendix 6 of the Cost-Benefit Analysis of the ISP. It's stated as the main driver by AEMO. If there were no perfect foresight and we had a major weather event after its construction, or if the costs from Snowy 2.0 or the VNI West were included in the business case, it would also not be advanced. If the decision rules put in place in the draft 2022 ISP intended to protect consumers in events such as the cost running out were still there, HumeLink would not be advanced today. If AEMO built a model to construct it in the schedule within which we're currently planning on building it, that would highlight the excessive costs being put onto consumers' bills, and I think it would be much harder for the project to be advanced today. But even that basic effort has not been done.

We put it to you that there is simply no way to know at least the spirit of these intentions of the market bodies, such as those given by the regulator. The core focus of the AER can be found in our purpose to ensure energy consumers are better off now and in the future. From the regulator's own submission, there is no chance that by advancing HumeLink the spirit of that intention has been respected. We even have plenty of examples of instances where there have been breaches of the technical letter of the rules as well, such as them skipping the mandated consultation on the passed updates in order to rush through feedback loop notices for HumeLink. They also ignored the requirements that the regulator determine the likely timings, instead accepting the proponents' proposals for timings despite the fact that AEMO's own analysis said there was almost no chance they would be met.

Answer

The identified need for the HumeLink project has remained consistent across the 2020 ISP, 2022 ISP and 2024 ISP. The identified need is to:

- *increase the transfer capacity and stability limits between the Snowy Mountains and major load centres of Sydney, Newcastle, and Wollongong,*
- *enable greater access to lower cost generation to meet demand in these major load centres, and*
- *facilitate the development of renewable generation in high quality resource areas in southern New South Wales, which will further lower the overall investment and dispatch costs in meeting New South Wales demand while ensuring emissions targets are met at the lowest overall cost to consumers*.

Humelink forms part of the Optimal Development Path (ODP) in the 2024 ISP, which is the lowest-cost path to meet Federal and state government energy policies. The transmission projects in the ODP are assessed together to avoid any risk of double counting. Humelink is one of the transmission projects in the ODP which collectively are expected to recoup their $16 billion investment costs, save consumers a further $18.5 billion in avoided costs, and deliver emissions reductions valued at $3.3 billion. Without these transmission projects, consumers would pay more for electricity.

The HumeLink project has an actionable window of six years after its earliest in-service date of 2026-27. In preparing the 2024 ISP, AEMO compared the net market benefits of two separate candidate pathways which differed only on whether HumeLink is delivered within its actionable window or not, for each scenario. This analysis found that delivering the Humelink within the actionable window resulted in an increase in weighted

net market benefits of $1.06 billion. AEMO has consistently assessed the HumeLink project to ensure it provides net benefits for consumers based on the estimated cost.

AEMO introduced the concept of ‘decision rules’ for HumeLink in the Draft 2022 ISP. The proposed ‘decision rules’ are not part of the National Electricity Rules - they were proposed by AEMO with the intention of providing transparency on the justification of the project. AEMO did not apply the ‘decision rules’ in the final 2022 ISP or in subsequent ISPs on the basis that ‘decision rules’ can become out of date, leading to the assessment of the project against information that was no longer current.

AEMO assessed that the feedback loop was a more appropriate mechanism to achieve the same objective. The feedback loop is a step in the regulatory process which ensures a project AEMO has identified as an actionable ISP project remains aligned with the Optimal Development Pathway in the most recent ISP, before the proponent can submit a contingent project application to the AER. The feedback loop assessment by AEMO must be undertaken against the most current information (including the latest project costs) in the latest draft or final ISP. AEMO therefore determined that removal of the ‘decision rules’ did not reduce consumer protections against over-investment as using the feedback loop provides better protection. The Humelink project has been through the feedback loop four times, each time confirming that the project remained on the ODP.

When those feedback loops were undertaken, the NER at the time required AEMO to carry out the feedback loop against “the most recent ISP” which included an ISP updated by an ISP update. The NER enables ISP updates to be issued after a consultation process. In two instances (2021 and 2023), when feedback loop requests were received shortly after the publication of draft ISPs (which represented the latest available information), AEMO issued ISP Updates to update the most recent ISP with the ODP comprising the plan in the relevant draft ISP so that the latest information could be used in conducting feedback loops. AEMO issued the ISP updates based on the ODP in the draft ISP, relying on consultation undertaken in preparing the draft ISP. In both instances, AEMO and the AER agreed that AEMO was not required to undertake an additional consultation on the ISP Updates alone as there had already been consultation, including on the inputs, assumptions and scenarios for the next ISP, and substantive consultation was already occurring on a draft ISP. Stakeholders were able to provide submissions on the relevant issues in relation to the draft ISP and further consultation would have been duplicative. AEMO consulted with the AER before the AER endorsed this approach. By the time AEMO approved its final feedback loop assessment for HumeLink, AEMO had consulted on HumeLink being part of the ODP in three separate ISPs.

The NER has since been amended to enable AEMO to undertake feedback loops against the latest draft or final ISP.

Question thirteen

Mr Morrison, Centre for Independent Studies – I haven't necessarily tried to say that AEMO can't do it or shouldn't do it, but there are problems with the way they're currently doing it and with the proliferation of roles they have now had and the potential and perceived conflicts that they have. For example, they are in the regulatory system, where they give final economic approval for major transmission projects worth billions of dollars—that's what the feedback loop is; they do give that final check with the ISP, which, of course, they write—and, on the other hand, they are also involved in being the proponent. They are actually the company in Victoria that is building VNI West and other major lines, and they're doing early stages of that. So I think there is a huge potential conflict. As well, they're administering the grants for all the renewable energy and subsidy schemes. AEMO Services is the Consumer Trustee running the LTESAs in New South Wales. So the proliferation of AEMO into various different parts of the planning system is a huge concern.

So, as to whether their role as a planner makes any sense, I'd tend to take very seriously the question about whether a monopoly planner in the middle a good idea is and whether it has worked well I think that I'd certainly support proposals for root-and-branch reform.

Answer

AEMO's roles and functions are conferred by Governments. As the energy transition has evolved, Governments have decided to evolve AEMO's functions. AEMO's roles as the system and market operator provide operational insights and context for AEMO's other functions.

The accountability and governance framework for AEMO ensure roles and functions are performed consistently with the legislation that confers the roles and functions. There are three key aspects to AEMO's governance framework:

- **Corporate governance** – as a not-for-profit company limited by guarantee, AEMO is required to comply with its Constitution and the relevant provisions of the *Corporations Act 2001,* including those relating to director duties and corporate reporting requirements.
- **Performance of statutory functions** – AEMO's Board of Directors is the only decision-making body that is responsible for the performance of AEMO's statutory functions. AEMO's members cannot override the Board in relation to decisions about the performance of AEMO's statutory functions, and this is detailed in AEMO's Constitution.
- **Ministerial Council oversight** – AEMO is also accountable to the Energy and Climate Change Ministerial Council (ECMC) rather than to any one Minister and has an obligation to report on its performance, budget, key priorities, and emerging issues. AEMO regularly attends ECMC meetings to report to Ministers.

AEMO also has mechanisms to manage perceived or real conflicts of interests. This includes an explicit clause within the AEMO Code of Conduct regarding declarations of conflicts of interest, as well as staff training to ensure awareness of the Code of Conduct and conflict of interest responsibilities.

There are also additional specific processes around particularly sensitive matters such as tenders. For example, AEMO Services conducts tenders under a probity framework that governs the tender process and the conduct of AEMO Services and personnel involved in tenders. Any conflicts identified must have a corresponding conflict management plan to manage probity risks. For significant tenders, we also appoint an independent probity auditor to oversee processes.

AEMO Board members manage conflicts of interest in accordance with the Director Interests Protocol, which addresses both declaration of interests and management of conflicts (both in relation to release of sensitive information to conflicted directors and the deliberation and voting process).

Victorian planning role

In Victoria, since 2009, AEMO has unique declared network functions under section 50C of the National Electricity Law (NEL), conferred on AEMO by the combined operation of section 49(1)(g) of the NEL and section 32 of the National Electricity (Victoria) Act 2005. These functions include planning and contracting for augmentations to the transmission network in Victoria. The primary transmission network service provider (TNSP) in Victoria is AusNet Transmission Group Pty Ltd. AusNet owns and maintains most of the transmission network infrastructure in Victoria, and AEMO plans the transmission network and makes investment decisions in accordance with the National Electricity Law and National Electricity Rules as they apply in Victoria.

The Victorian Government proposes to transfer AEMO's Victorian declared network functions to VicGrid, subject to the passage of further legislation expected early next year. The transfer of functions is expected to occur on 1 July 2025.

NSW Consumer Trustee

AEMO Services Limited is a subsidiary of AEMO. AEMO Services Limited was appointed as the Consumer Trustee under the Electricity Infrastructure Investment Act 2020 (NSW) (EII Act) in 2021, and since then has carried out its functions under the EII Act to conduct four competitive tenders to support NSW to meet its legislated minimum investment objectives (12GW generation, 2GW long-duration storage). AEMO Services Limited has also designed the financial contract that supports this new infrastructure, the Long-Term Energy Service Agreement (LTESA).

The EII Act requires the Consumer Trustee to act independently and in the long-term financial interests of NSW electricity customers.

Question fourteen

Mr Morrison, Centre for Independent Studies – I think the story of the ISP's evolution and the way these interconnected projects are tracked through it is that it's gotten harder and harder to pretend that they do have a good economic business case. The extra interventions required to match when the costs escalate become more and more unlikely and inappropriate. One of things done to help artificially boost the case of interconnectors that wouldn't normally stack up is to conflate them and connect them with other sunk-cost resources such as Snowy 2.0. There has never been a business case for Snowy 2.0 that has been exposed to public scrutiny. Certainly, when you connect it with the transmission costs, it would never stack up, I think. Each of those transmission interconnectors to each end of Snowy 2.0 have the benefit of unlocking all that sunk cost in Snowy 2.0. It's a horrendous economic modelling flaw when that subsystem as a whole would make no sense. For each part of it to pretend that the others are there free is an appalling method.

Mr Morrison, Centre for Independent Studies – I just want to highlight the particular inconsistency with this and AEMO's response to that idea of these linked systems basically counting the benefits of the whole bridge but only the cost of each part. We identified this in a submission we put to AEMO on the draft 2024 ISP and identified that it overinflates and double-counts benefits. We thought, in particular, in the case of HumeLink and VNI West, it's overinflating the benefits of those two projects. We'd suggested they should consider these functional subsystems as a whole and try to consider a path which just took them all out together and said, 'Let's not attempt that entire bridge.' The response was this, from page 58 of the 2024 ISP consultation summary report:

> *AEMO acknowledges the relationship between HumeLink and VNI West and could have performed TOOT analysis on these combined projects. Given the relationship was not assessed in previous ISPs, AEMO considers it prudent and transparent to assess the merits of each project in isolation, in line with previous assessments.*

They've acknowledged the problem in their response here. They do accept that you get a higher sum of benefits when you do everything individually. But they'd rather be consistent and wrong than respond to the feedback that's identified a flaw, particularly a critical flaw on which a $5 billion investment—no, plus VNI West there's a good $7 billion, $8 billion or $9 billion. They would rather be consistent.

Answer

The ISP includes the cost of future investment decisions. The ISP does not model the cost or benefits of infrastructure that was built in the past, is under construction, is committed to or is anticipated to be developed. As such, the ISP does not evaluate the merits of previous investment decisions such as Snowy 2.0, or any other built, committed, or anticipated projects. This approach is considered best practice, is required by the AER's Cost Benefit Analysis Guidelines, and is aligned with Infrastructure Australia's Guide to Economic Appraisal.

While not required by the NER or the AER's Guidelines, the ISP includes Take One Out at a Time (TOOT) analysis to provide transparency on the value of individual projects. TOOT analysis is not used to determine which projects should be actionable (and should progress to delivery to meet power system needs). AEMO acknowledges that the sum of the benefits from the individual TOOT analyses is greater than the total benefits in the ISP's Optimal Development Path (ODP). Given the way these analyses are conducted, this is to be expected, but it is not relevant given the TOOT analysis is not part of the analysis to select the ODP in the ISP.

In determining the ODP, all projects are considered together in the core analysis. In this way there can be no double-counting of benefits when selecting the ODP.

Question fifteen

Dr Taylor, Independent Engineers, Scientists, and Professionals – Our submission has stated quite clearly that there is a serious lack of accountability in the system. AEMO's ISP efforts are not being reviewed by anybody external to itself. Their public consultations are a good idea, but the people who evaluate those inputs are AEMO themselves, and they're free to ignore them and carry on as they always have.

Answer

There are a number of accountability mechanisms in place for the ISP and AEMO's role.

Developing the ISP is one of AEMO's statutory functions. AEMO's Board of Directors is accountable for the exercise of AEMO's statutory functions.

Development of the ISP

The ISP is developed and consulted on in accordance with prescriptive requirements in the National Electricity Rules (NER) and AER guidelines. The Australian Energy Regulator (AER) reviews AEMO's compliance with AER guidelines in preparing the IASR, ISP Methodology and Draft ISP, and conducts a transparency review of the draft ISP to assess the adequacy of AEMO's explanations of its inputs and assumptions.

The NER establish a rigorous framework which requires transparency and extensive stakeholder consultation. In addition to consulting on the Inputs, Assumptions and Scenarios Report (IASR), the ISP Methodology, and the Draft ISP, AEMO has elected to publish the ISP economic model so that stakeholders can reproduce modelling outcomes.

The NER ISP framework is itself an outcome of rigorous consultation and review.

It takes around two years to develop an ISP. AEMO publishes a timeline for the next ISP within three months of the publication of the previous ISP.

- Year 1 – development of and consultation on inputs, assumptions, and scenarios (and review of the ISP methodology at least every four years).
- Year 2 – development of the final ISP, including consultation on a draft.

Stakeholders who have made a submission to AEMO in its preparation of an IASR, ISP methodology or draft or final ISP, may submit a written notice to the AER within 30 days of an ISP's publication to dispute whether AEMO has complied with the relevant NER requirements in preparing the relevant document.