

The Energy Users' Association of Australia (EUAA) is the peak body representing Australian commercial and industrial energy users. Our membership covers a broad cross section of the Australian economy including significant retail, manufacturing, building materials and food processing industries. Combined our members employ over 1 million Australians, pay billions in energy bills every year and in many cases are exposed to the fluctuations and challenges of international trade.

This submission comments on a range of issues across the PADR. For each issue we discuss what the proponents say and make comment. We then provide a number of questions that would form the basis of further engagement with AEMO and Transgrid. We would propose that these questions be combined with other questions that arise in submissions which would then be addressed at a combined engagement session (AEMO, Transgrid and consumer advocates) to ensure all stakeholders have the opportunity to be involved. In particular we would propose a deep dive with stakeholders on the key issue of the methodology used to justify the benefit stream starting 9 years before project completion – including starting some years before it is even approved by the AER.

We will also look forward to engagement with the proponents through:

- the Transgrid Advisory Committee (and its subsidiary ETWG recently established to look more deeply at ISP projects) where we are members of both, and
- AEMO's Consumer Panel.

We look forward to those discussions in the near future given the timetable to complete the PACR by December 2022.

## National Electricity Objective

In our submission on the PSCR we noted 'we could find no mention of the NEO in the PSCR analysis'. Surprisingly we can find no mention of the NEO in the PADR. There is a whole Appendix on compliance with the rules and the AER CBA Guideline, but nothing on what compliance with the NEO means in practice (as opposed to compliance with specific rules).

### Questions

- Why is there no mention of the NEO?
- If you were to include explicit acknowledgment of the NEO, what impact would it make?

## Executive Summary - Project timing and Section 6.2 - VNI West – Option 1

Table 5 p. 56 has the ISP timing for VNI West under the Step Change scenario as July 2031<sup>1</sup>, but the Section 8 discussion the NPV calculations says commissioning in 2031-32.

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<sup>1</sup> See p. 13 <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en>

For the other two key associated projects, the PACR says (p.7):

“The Western Renewables Link and Project EnergyConnect are currently under development. For the purpose of this RIT-T, they are treated as anticipated projects and assumed to be delivered in a timely manner to enable VNI West to connect efficiently to the network.”

The 2022 ISP says both projects would be complete by July 2026<sup>2</sup> i.e. full capacity available following completion of all testing. The 2021 ESOO had full capacity from June 2025<sup>3</sup>.

Mondo provides no dates on its website for start of construction, let alone completion, for the Western Renewables Link. The proponents say that one of the ‘Key developments since the PSCR have been reflected in this PADR’ is (p.7):

“Identification by AusNet Services of the proposed route for Western Renewables Link in November 2021”

But ‘identification’ does not mean ‘finalisation’ or ‘approved’. It is still subject to the Environmental Effects Statement under Victorian legislation.

### Questions

- What does ‘delivered in a timely manner’ mean for Humelink and WRL?
- What is the reason for the one-year delay in VNI West, just one month after publication of the 2022 ISP?
- What are the current assumptions on full commissioning of PEC, WRL and Humelink?

### **Section 4.5 – Accuracy of cost estimate**

The discussion below on Section 8.1 covers the claimed level of cost accuracy in the PADR and, in particular, our confusion about what ‘class 4’ means. This discussion comments on the proponents’ response to the EUAA submission on the PSCR recommending a much more accurate cost estimate at the PACR stage. The proponents outline a number of ‘check points’ (p. 38):

“...to confirm that the project remains on the optimal development path if the estimate of project costs increases materially.”

And that (p.39):

“These measures together ensure that the preferred option only proceeds where it is expected to be net beneficial to consumers.”

<sup>2</sup> 2022 ISP Appendix 5 p 16 for PEC and p.18 for Western Renewables Link <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/a5-network-investments.pdf?la=en>

<sup>3</sup> See p. 47 [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/nem\\_esoo/2022/2022-electricity-statement-of-opportunities.pdf?la=en&hash=AED781BE4F1C692F59B1B9CB4EB30C4C](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2022/2022-electricity-statement-of-opportunities.pdf?la=en&hash=AED781BE4F1C692F59B1B9CB4EB30C4C)

However, the AEMO feedback loop only confirms whether the project is still part of the optimal development path at the nominated project cost. It does not confirm that the project is still the preferred option and still has net benefits, which was the major reason the earlier EUAA submission sought to get more accurate cost estimates at the PACR stage.

So it is unclear how consumers can get confidence that there are net benefits for the whole project given we expect the costs from the winning bidder on the Victoria side will be confidential.

### Question

- How can the proponents give consumers confidence that the project will have net benefits at the initial and final CPA stages?

### **Section 5.1.2 – Lessons learnt from previous projects and Section 5.2.2 - Land access, easements and compensation**

The recent experience of PEC, Western Renewables Link and Humelink indicates the significant influence that route selection can have on both project cost (and hence the estimate of net benefits) and timetable.

The ‘routes’ in the PADR are ‘high-level schematic illustrations only’, not specific line routes (p. 8). The proponents state in a number of places (e.g. p. 4 and p.43) that route selection is not part of the RIT-T process but part of subsequent early works. The proponents say (p. 4):

“The environmental, land-use, safety, amenity, social, cultural and community matters raised by stakeholders are important considerations that, if not appropriately taken into account, will result in higher project costs which would lower benefits for consumers. At the RIT-T stage, these factors can only be considered at a high level using desktop studies, because the route (and therefore the potentially impacted communities) is not determined until after the RIT-T is finalised. As a result, allowances have been made in the cost to accommodate adjustments to the project such as route detours that may later be determined to be needed to mitigate adverse environmental or social impacts.”

And acknowledge that these early works consultations may lead to some undergrounding (p.8):

“AVP and Transgrid acknowledge the importance of considering all reasonably practicable route refinement options, which may, in exceptional circumstances, include partial undergrounding over short distances. The factors to be considered are route-specific and can therefore only be investigated, and remediation options considered, as part of the project’s early works stage, following the RIT-T process.”

We understand that finalising the route is complex and time consuming work. The proponents refer to the ISP that has two CPA stages – early works and then implementation – with the early works expected to take 3-4 years to complete. Work (p.5):

“...may include project initiation, land-use planning, detailed engineering design, route development, biodiversity offset strategy, cost estimation, and strategic network investments, such as the enhancement

of Project EnergyConnect. Early works will provide an opportunity to engage with and consult communities and stakeholders on a range of matters. The works will also reduce cost uncertainties and provide greater confidence to consumers that they will not be over-or under-investing in this key project. Some early works in New South Wales are currently underway and have been supported via underwriting by the Federal Government announced in early April 2022.”

The discussion (p.48) says the preference is for voluntary agreements but also mentions the NSW and Victorian legislation under which land can be compulsorily acquired by transmission companies if a voluntary agreement is not possible. In Transgrid’s application to the AER for Humelink early works finding, Transgrid assumed 30% of the route would be acquired by compulsory acquisition<sup>4</sup>.

Experience so far has shown that the estimates at the PACR stage considerably underestimate the final cost submitted as part of the CPA, particularly for land acquisition and biodiversity. For PEC, property and easements, environmental offsets and biodiversity costs totalled 19.6% of the ‘best and final offer’ in the CPA application in September 2020<sup>5</sup>. This has increased from 13.4% just three months earlier in the initial CPA application<sup>6</sup>. In the Humelink PACR, biodiversity costs were \$935m or 28% of the total capex of \$3.32b. This compared with the PADR biodiversity costs of \$320m.

In the VNI West PADR model, even with the addition of \$314m since the ISP was published in June, property/land access/easements/ biodiversity costs for both sides of the border total only \$211.9m or just 6.5% of the total \$3.26b cost. Based on recent evidence, we think it highly likely that these costs will escalate dramatically.

### Questions

- What methodology do the proponents propose to use in the desk top exercise described in Appendix 3 to ensure the accuracy of the risk amounts included in the PACR for social licence – land access, easements and biodiversity?
- Will that estimate include an assumption on the level of compulsory acquisition?
- What additional level of knowledge will you have on the route in the PADR?
- How do the proponents consider they can give confidence to consumers that the project will have net benefits at the PACR stage when route is not determined and recent projects have shown considerable increases in the costs of land access and biodiversity subsequent to the completion of the PADR?

### **Section 6.5 - Alternative options considered but not progressed**

While VNI 6 (Ballarat-Shepperton-Wagga) was ‘discounted’ in the 2022 ISP, why was a Ballarat – Shepperton - Dinawan option not considered given that it is reasonable to assume that it would be lower capex given the shorter distance but have similar market benefits to Option1?

<sup>4</sup> See p. 2 <https://www.aer.gov.au/system/files/EUAA%20HumeLink%20Stage%201%20CPA%20General%20Questions.pdf>

<sup>5</sup> See Table 2.2 p.5 <https://www.aer.gov.au/system/files/TransGrid%20-%20A.5A%20-%20PEC%20-%20Supplementary%20Capex%20Forecasting%20Methodology%20BAFO%20-%202030%20September%202020.pdf>

<sup>6</sup> See <https://www.aer.gov.au/system/files/TransGrid%20-%20Project%20EnergyConnect%20-%20Principal%20Application%20-%2029%20June%202020.pdf>

We understand that the transfer capability between Victoria and NSW in both directions is identical for either project – 1,930 MW north and 1,800 MW south. While the REZ hosting capacity for Kerang may potentially be 1,000 MW higher, based on its connection point being Dinawan, the hosting capacity for either project exceeds the additional VNI West transfer capacity – 3,000 MW via Shepparton, (if connected to Wagga) and 4,000 MW via Kerang. Neither the 2022 ISP nor this PADR sets out details for the Shepparton project route connected at Dinawan as opposed to Wagga.

If both options deliver the same effective REZ hosting capacity, based on the transfer capability of the project being the same via either route, then what is the additional net market benefit of Option 1 compared to the project route via Shepparton connected to Dinawan given we would expect Option 1 to have a higher cost? The transfer west across Project Energy Connect will also use up to 800 MW of the 1,930 MW of additional northward transfer capacity between Dinawan and Wagga Wagga in any case. This suggests the additional REZ hosting capacity of the Option 1 via Kerang is even less important and unlikely to provide additional market benefits.

### Question

- Why was the Ballarat – Shepparton - Dinawan option not considered?

### **Section 8.1 - Cost estimates**

The cost of VNI West has increased considerably over time compared to earlier version in the 2018 and 2020 ISPs. The PADR says (p.71):

“The level of granularity in the revised cost estimates is considered consistent with that in the AEMO Transmission Cost Database that has been extensively consulted on in 2021 for the 2022 ISP. The overall cost estimates for each option are broken out across these categories in Table 4, Section 6.1. Appendix A3 provides additional detail in response to submissions on the cost estimating methodologies applied for each of these categories (for both the Victoria and New South Wales components). The revised cost estimates are considered to an accuracy of  $\pm 30\%$ , which AVP and Transgrid consider to be ‘class 4’ estimates.”

We find this confusing and it is not helped by the range of definitions of the accuracy bands of different cost classes used in recent reports. In the last sentence of the PACR quote there is a footnote reference to p.12 in the Transmission Cost Report that does not refer to accuracy bands. When it does (p.15) it is discussing future ISP projects or Preparatory activities for future projects, not the PADR.

Transgrid assessed its capex estimate in the Humelink PACR as<sup>7</sup>:

“We consider our cost estimates to be ‘class 4’ estimates, which is in-line with the level of accuracy expected at this stage of the investment process. For example, AEMO commented during the consultation process on its transmission cost database that the cost certainty at the PACR stage is typically between -30 per cent and +50 per cent (‘class 4’ estimates)”

<sup>7</sup> See p. 24 <https://www.transgrid.com.au/media/rxancvmx/transgrid-humelink-pacr.pdf>  
EUAA Submission: VNI WEST PADR | 09 September 2022

Given the extensive debate around cost accuracy in recent times and the constant reference to the AACE cost classification, we can only assume that the proponents are referring to that AACC categorisation<sup>8</sup>. Footnote 128 on p. 71 cites the ISP Transmission Cost Database report that does refer to the AACE classification<sup>9</sup> as does the GHD report to AEMO that provided advice on the estimates and their accuracy bands<sup>10</sup>. But the AACE description of class 4 has an accuracy band of -30 to +50%, not  $\pm 30\%$ . As part of the development of the ISP Transmission Cost Report, GHD provided a report to justify the use of symmetrical accuracy bands for each class rather than the non-symmetrical bands in the AACE classification.

This drew on the work the work by GHD on the accuracy bands used in the development of the AEMO Transmission Cost Database<sup>11</sup>.

**Table 8 Total unknown risk factors, on average, at different cost estimate classes and associated accuracy range**

Cost estimates	Class 5	Class 4	Class 3	Class 2	Class 1
Total unknown risk factor	~15%	~9%	~4%	0%	0%
Accuracy range	$\pm 30\%$	$\pm 20\%$	$\pm 15\%$	$\pm 10\%$	$\pm 5\%$

This led to the following symmetrical accuracy bands in the Transmission Cost Report that focused on Class 5 estimates with Class 5a having the  $\pm 30\%$  accuracy band.

**Table 7 Class 5 estimate sub-categories**

Class	Definition	Unknown risk allowance <sup>2</sup>	Accuracy <sup>1</sup>
Class 5b	Concept level scoping with no site-specific review or TNSP input	30%	$\pm 50\%$
Class 5a	Screening level scoping including high level site-specific review and TNSP input	15%	$\pm 30\%$

The Transmission Cost report notes that the symmetrical accuracy bands were<sup>12</sup>:

“... determined by GHD using statistical analysis of current major projects as they progressed from screening stage scope definition to CPA – further detail on this analysis is provided in the GHD report. Accuracy bands have been derived statistically, such that 80% of project estimates should fall within these limits. It is therefore expected that, across a large sample of projects, approximately 20% of them will fall outside of these bands.”

This GHD analysis was completed in May 2021 and was designed to apply only to the ISP estimation of the Transmission cost database for future ISP projects (Classes 5a and 5b), not PADR cost estimates.

<sup>8</sup> See [http://web.aacei.org/docs/default-source/toc/toc\\_97r-18.pdf](http://web.aacei.org/docs/default-source/toc/toc_97r-18.pdf)

<sup>9</sup> See the discussion on pp10ff <https://aemo.com.au/-/media/files/major-publications/isp/2021/transmission-cost-report.pdf?la=en>

<sup>10</sup> <https://aemo.com.au/-/media/files/major-publications/isp/2021/transmission-cost-database---ghd-report.pdf?la=en>

<sup>11</sup> See p. 30 [https://aemo.com.au/-/media/files/stakeholder\\_consultation/consultations/nem-consultations/2021/transmission-costs-for-2022-isp/transmission-cost-database-ghd-report.pdf?la=en](https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2021/transmission-costs-for-2022-isp/transmission-cost-database-ghd-report.pdf?la=en)

<sup>12</sup> See p.16 <https://aemo.com.au/-/media/files/major-publications/isp/2021/transmission-cost-report.pdf?la=en>

**Table 1 Intended use of the TCD**

Stage	Future ISP projects	Future ISP projects with preparatory activities	Project Assessment Draft Report (PADR) in development or completed	Project Assessment Conclusions Report (PACR) completed	Contingent Project Application (CPA) and ISP feedback Loop
Example Projects	Network expansion options and candidate REZs in early stages	QNI Medium and Large, CQSQ, New England REZ etc	HumeLink, Marinus Link, Central-West Orana, VNI West		PEC, VNI Minor (NSW works)
Price certainty*	Class 5/4	Class 4/3	Class 4/3	Class 4/3	Class 3/2
Source of ISP Estimate	TCD	TNSP	TNSP	TNSP	Not required for ISP

Cost estimates were developed in a deterministic way. There are approximately 650 unique building blocks in the Cost and Risk Data workbook grouped into 3 network element categories (station, overhead lines and underground cables) and 26 sub-categories in total. Once the base data was assembled, 22 network elements (9 stations and 13 overhead line) were used for benchmarking the cost estimation tool. The GHD database also includes components not covered by these 22 projects e.g. easement/property/offsets cost components based on their data base of projects and different jurisdictional requirements e.g. offset costs are higher in NSW.

GHD considered this to be:

“...a reasonable approach given the lack of major transmission augmentation project works in the NEM in recent history and thus the absence of actual cost information.”

In commenting on the data in the table, GHD note that<sup>13</sup>:

“... the improving accuracy range as the cost estimate matures have been formed based on linear extrapolation of recent NEM projects early stage cost estimate accuracy range and the AACE RP 96R-18 optimistic accuracy range for more advanced stage cost estimate (as shown in Figure 9). We note that this representation of improving accuracy range is mostly academic and based on observation of recent NEM projects as their cost estimates matured. Given the lack of major transmission augmentation project works in the NEM in recent history and thus the absence of empirical actual cost information allowing the estimate vs actual cost analysis (with benefit of hindsight), further conclusive insight into the improving accuracy range is unavailable. As such the data in the following table should be viewed in this context.”

Since the publication of that report, we have seen PEC approved capex at \$2.29b compared with the PACR of \$1.53b. We have seen the Humelink capex increase by 250% from PADR \$1.36b (June '20) to the PACR \$3.32b (July '21). We also continue to see the complex engagement underway with the Western Renewables Link which seems to have driven an increase in the VNI West cost, only a month after the publication of the 2022 ISP (p.72):

<sup>13</sup> GHD op cit p.30

“The VNI West cost estimates used in this PADR differ from those presented in the 2022 ISP by approximately \$300 million due to the level of line cost contingency provisioned in the Victorian component of the project to account for remediation of social and environmental concerns... this recognises that, based on recent experience, some level of route diversion, tower redesign, or screening may be required beyond that anticipated and included in the Victorian component of the estimate presented in the 2022 ISP. This contingency cost provision does not anticipate undergrounding costs. If partial undergrounding is required in exceptional circumstances, a greater level of cost contingency would be needed.”

Developing the PACR cost estimate on the basis of a ‘desk top’ route based on ‘allowances’ or contingencies’ leaves the PACR cost open to the risk of the same considerable cost increases that have occurred with Humelink and PEC. It is surprising that this adjustment stops at the Murray River. There is considerable debate between Transgrid and landowners along the Humelink route around the same issues including route selection, tower design and undergrounding.

AEMO’s aim in building the transmission cost database is to continually add new data to improve the database accuracy. The proponents have the advantage of actual costs from PEC and advanced estimates from Humelink to draw on for many of the engineering components e.g. substation and line works that should provide estimates, for at least some major cost categories, that are more accurate than ‘class 4’ (however that is defined).

Transgrid’s recently published Annual Planning Report<sup>14</sup> proposes to:

“...integrat(e) the construction of three separate Southern Australia projects – Humelink, Energy Connect and VNI West (Victoria NSW Interconnect) – into a single simultaneous program. We are confident this approach can deliver the portfolio by 2028 and earlier than currently projected in the ISP. By delivering efficiencies and benefits of scale, this program approach will likely save significant amount in program costs, which would see significant savings on the average residential customer bill.”

With claimed potential \$500m reduction in combined costs<sup>15</sup>.

### Questions

- What do the proponents mean by ‘class 4’?
- What is the basis for the symmetrical cost accuracy?
- How have the proponents utilised cost data from Project Energy Connect and Humelink in the PADR cost estimate?
- What was the basis for the selection of \$300m additional cost? Why do the proponents consider that issue will not arise on the NSW portion of the route?
- Did adding the \$300m to the cost change the ±30% accuracy band? If not, why not?
- What level of cost accuracy do you expect in the PACR? What are the key features of the PACR work that will lead to an increase in the level of accuracy?

<sup>14</sup> <https://www.transgrid.com.au/media/jn4klv4s/tgr12164-tapr-2022-v5-4-final.pdf>

<sup>15</sup> <https://www.afr.com/companies/energy/transgrid-s-plan-to-streamline-8b-grid-build-out-20220816-p5ba4y>



- What is the impact of the announcement in the Transgrid Annual Planning Report on VNI West capex? Does it reduce the ‘allowances’ or ‘contingencies’ at the PACR stage?
- What benefits will the Federal Government’s \$75.8m underwriting agreement with Transgrid on the ability to have a more accurate cost estimate in the PACR?
- Will consumers have to pay that \$75.8m if the project proceeds?

## Section 8.2 – Expected market benefits from expanding transfer capacity

The PADR describes how VNI West:

“...unlocks significant transmission transfer capacity for the Murray River (V2) and Western Victorian (V3) REZs and that these REZs, in addition to the South-West New South Wales (N5) REZ, have considerably more renewable capacity built, compared to the ‘do nothing’ base case, in all three scenarios modelled.”

We are concerned about the double counting of benefits across different projects being developed under different jurisdictions and regulatory frameworks. In our submission on the PSCR we commented that:

“We would like to see more co-ordinated evaluation of the various projects to increase New South Wales – Victorian interconnection to ensure benefit streams are not being double counted in each separate RIT-T process and the impact of recent New South Wales Government announcements on REZs will be taken into account.”

The response in the PADR is (p. 113):

“In line with the AER’s Cost Benefit Analysis Guidelines, the modelling in this PADR reflects the actionable ISP projects and major transmission projects in the ISP optimal development path, and AVP and Transgrid note that inclusion of these projects in all PADR analysis is a requirement of the CBA Guidelines, unless a ‘demonstrable reason’ can be provided for not including them. See Section 4.5.”

### Questions

- What confidence can the proponents provide that the benefits to NSW REZs are not already counted in the NSW Roadmap and Victorian REZs will only be counted as part of the Vic Grid initiative?
- What benefits are included from the connection of Humelink to Project EnergyConnect?
- Given the historical high output correlation of VRE generation in eastern and north eastern South Australia, northwest Victoria and southwest New South Wales, how does the combined connection of Project Energy Connect and VNI West at Dinawan impact the claimed benefits for VNI West and how can consumers be confident this has been modelled correctly.

## Section 8.4 – Modelling of terminal values

We agree with the approach used in the modelling to use explicit expenditure profiles rather than the ISP approach of converting capital costs into an annual annuity to allow like for like comparison of different assets with different economic lives and different commissioning dates.

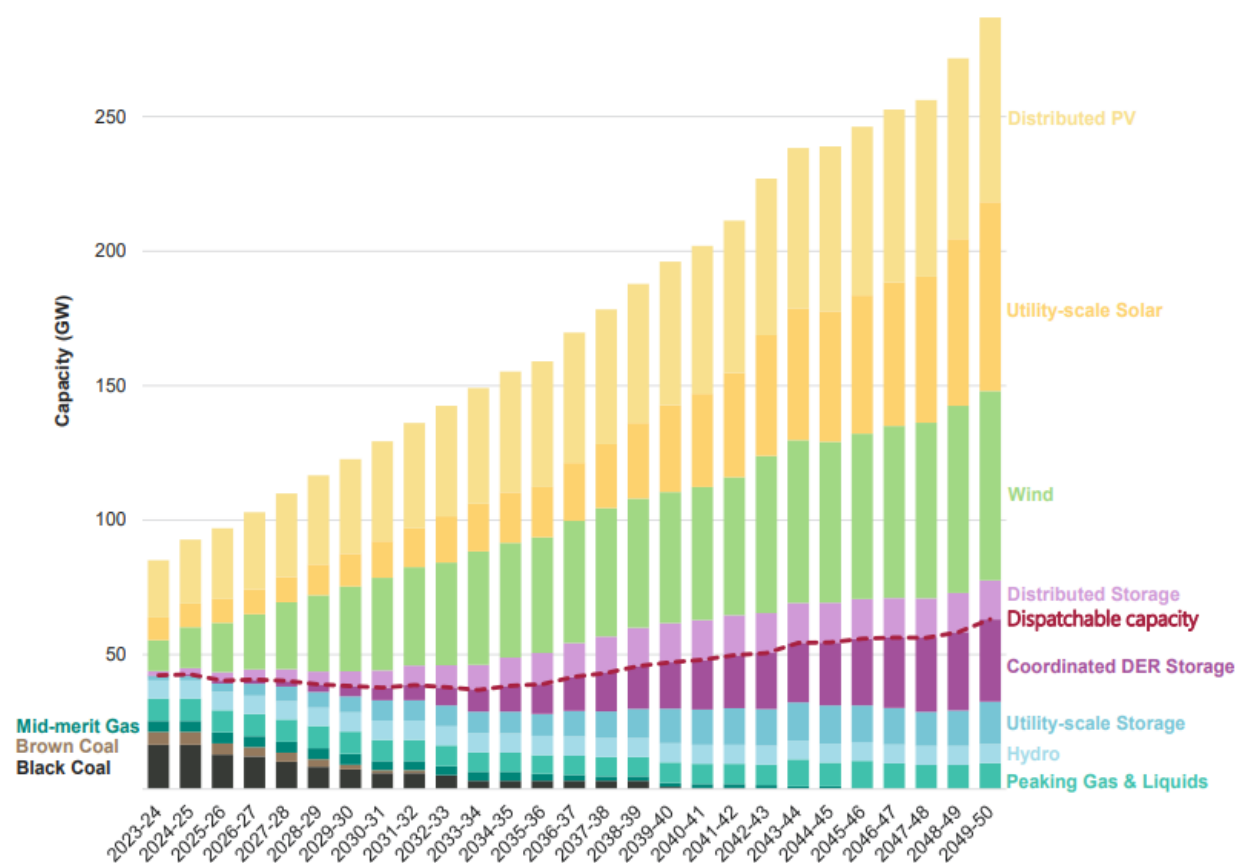
What we do have difficulty understanding is the approach to terminal values. The proponents note (p.79):

“The terminal value can be calculated by using a forecast of the benefit streams expected over the remaining life of the assets, or by relating to the remaining cost of the asset at the end of the assessment period. For this RIT-T, the terminal values are calculated as the undepreciated value of capital costs at the end of the analysis period and can be interpreted as a conservative estimate for benefits (net of operating costs) arising after the analysis period.

AVP and TransGrid consider that the assumption that benefits over the remaining life of the assets will exceed the undepreciated capital costs and the ongoing operating costs is reasonable based on the market benefits assessment undertaken. The market benefits assessment projected that market benefits net of operating costs in the last five years of the assessment period stabilised at around \$280 million per annum for Option 1 on a weighted basis. Using a benefit extrapolation approach would result in a terminal value approximately 1.6 times the terminal value used (in present value terms).”

If we understand Figure 8 correctly then this ‘conservative’ assumption involves assuming that fuel cost savings from a reduced need for gas generation continue for the 50 year life of the project i.e. until 2072. The 2022 ISP forecasts minimal gas plant at that time<sup>16</sup>.

**Figure 1 Forecast NEM capacity to 2050, Step Change scenario**



<sup>16</sup> See p. 9 <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en>

## Questions

- What empirical evidence do the proponent have that their assumption is ‘conservative’?
- What are the assumptions on fuel cost savings beyond 2047-48? What gas cost is going to be avoided in 2050? 2055? 2060?
- Given that the life of generation assets that connect to VNI West is about a half to a third of the asset life of the transmission assets, what are the assumptions around stranded asset risks underpinning what is seen as a ‘conservative’ assumption that the undepreciated value of capital costs at the end of just ~16 years of actual operation?

## **Section 8.4 - Discount rate and Section 9.5.3 – Alternative commercial discount rate assumptions**

The Proponents note that (p.79):

“The CBA Guidelines requires the discount rate used in the NPV analysis to be the commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector.”

They go on to use the values in the 2022 ISP that were set in late 2021 – a central rate of 5.5% (real pre-tax) and an upper bound sensitivity of 7.5%. The lower bound sensitivity is based on the AER’s Powerlink decision in April 2022.

There is also ‘boundary testing’ at the 10% rate proposed by the ISP Consumer Panel and supported by AEMO.

The selection of the central rate followed report by Synergies Economic Consulting. In the course of preparing the final version of that report, there was considerable debate on the relevance of the standard 7% central rate long recommended by Commonwealth Government project evaluation guidelines. In the Final IASR AEMO commented<sup>17</sup>:

“The central estimate of the discount rate is higher than the original rate proposed in AEMO’s Draft IASR, but lower than the 7% which has been typically applied by Australian policy-makers when undertaking cost-benefit analysis for infrastructure projects. Synergies notes that the default 7% assumption has become entrenched since around 1989, but also that it is reasonable to assume that it reflects higher government bond rates from the late 20<sup>th</sup> century compared to current rates and projections.”

Synergies advice was based on the 20 day average risk free rate at 31<sup>st</sup> May 2021 of 1.63%. It is currently ~3.7%. The Synergies report provided very limited evidence of what a commercial rate would be for a 50-60 year asset life project.

## Questions

- Do you still consider 5.5% an appropriate central discount rate given credit market developments since the IASR? If so, why?
- What evidence do you have that 5.5% is a commercial discount rate for large projects?

<sup>17</sup> See p. 105 <https://aemo.com.au/-/media/files/major-publications/isp/2021/2021-inputs-assumptions-and-scenarios-report.pdf?la=en>

- Why do you consider a 5 year ‘on the day building block approach’ from the Powerlink reset suitable sensitivity rate for a 60-year life asset?

## 8.5 Classes of market benefit not considered material

After noting that AEMO does not include competition benefits in the ISP and they will not be included in the feedback loop prior to Transgrid’s CPA submission on its part of VNI West, the PACR says:

“Notwithstanding this, AVP and Transgrid have undertaken a preliminary, order-of-magnitude assessment of competition benefits as part of the PADR analysis, to further determine whether this benefit category is expected to be material to the outcome of this RIT-T. These investigations have concluded that competition benefits are not expected to be material for this RIT-T and hence have not been included in the NPV assessment in this PADR.”

The PADR for Humelink (January 2020) said almost exactly the same<sup>18</sup>:

“However, in light of the core NPV results, we do not now expect that any competition benefits would be material in terms of identifying the preferred option for this RIT-T. This is on account of the PADR modelling finding that the largest capacity options are preferred, which can be expected to have the greatest impact on any competition benefits, and previous RIT-T findings that competition benefits do not add significantly to gross market benefits.”

And yet the Humelink PACR (July 2021), claimed that competition benefits were material after all. Perhaps the sudden relevance of competition benefits had something to do with the previously noted 250% increase in capex from the PADR (\$1.32) to the PACR (\$3.32b). The preferred option 3C only just got over the net benefits line without the \$452m of competition benefits. This PACR cost estimate was assessed by Transgrid as an AACE Class 4 estimate that could increase by 50%<sup>19</sup>. A 1% increase in capex wipes out the net benefits excluding competition benefits. A 15% increase in capex wipes out net benefits including competition benefits.

PV, \$millions	Option 1C- new	Option 2C	Option 3C
Total net benefits, with competition benefits	335	399	491
Total net benefits, without competition benefits	(11)	(44)	39
Gross benefits	1,778	2,174	2,196
Competition benefits	346	443	451

Transgrid undertook no stakeholder engagement on the inclusion of competition benefits because that finished at the PADR stage. Under the rules it was able to develop its own methodology, not consult on it and use it to decide

<sup>18</sup> See p.18 <https://www.transgrid.com.au/media/xrzd0jv4/transgrid-hume-link-padr-amended.pdf>

<sup>19</sup> See p. 24 <https://www.transgrid.com.au/media/rxancvmx/transgrid-humelink-pacr.pdf>

whether it has any obligation to inform the AER of a material change. As the AER noted in its decision on Humelink early works<sup>20</sup>:

“We acknowledge that it would have been good practice for Transgrid to consult on competition benefits given these benefits were not included in the PADR, notwithstanding no disputes were raised on this matter. Though, we also acknowledge submissions that some stakeholders may not have been aware of the dispute resolution aspects of the process in the NER. While RIT-T proponents are not obligated to outline the dispute resolution process in the PACR, we consider it would be good regulatory practice for RIT-T proponents to notify stakeholders of the dispute resolution process in the PACR”

### Questions

- What guarantees can the project proponents provide that they will not seek to include competition benefits at the PACR stage?
- If the proponents determine to include competition benefits in the PACR, can the proponents guarantee effective consultation will be undertaken regarding this prior to publication of the PACR

### **Section 9 – Net present value**

The CBA concluded that ‘avoided/deferred generation and storage capital costs’ (pp.73-4):

“...are the most material category of market benefit estimated for both options across the three scenarios.”

These costs refer to deferred/avoided investment of large-scale storage and gas as well as some early deferral of predominantly wind capacity up to the time of commissioning VNI West at the end of 2031-32. These benefits start accruing even before the project is approved. This is seen as a benefit because it (p.81):

“... allows for a less frenetic transition away from coal in the 2020s without violating the emissions constraint. This ultimately drives the deferral of some capital investment in wind resources that would otherwise have been needed to help maintain energy supplies following the coal closure, until after the commissioning of VNI West.”

This is the first time we have seen an argument that effectively says a slower transition from coal to renewables is in consumers’ interests. Yet AEMO told everyone in the recently released ESOO that<sup>21</sup>:

“This 2022 ESOO signals a need to urgently progress anticipated generation, storage and transmission developments, including ISP actionable transmission developments, to support the energy transition underway. With the NEM expected to experience a cluster of five announced coal-fired generator retirements in the next decade, and needing resilience for potential future closures as well, the investment need is pressing and widespread across the NEM.”

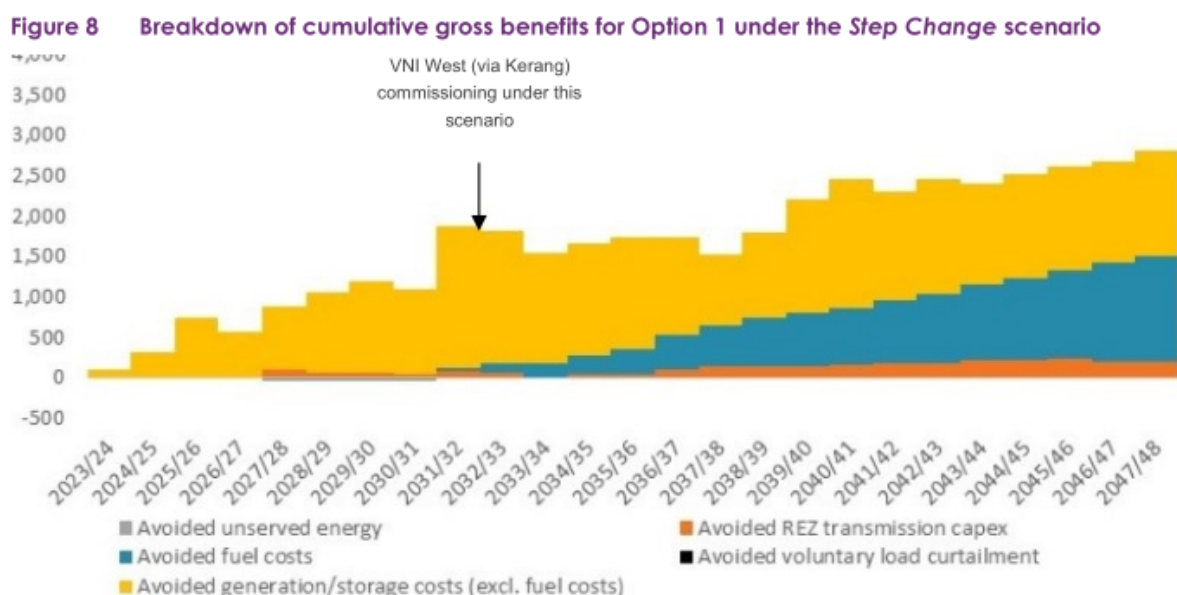
<sup>20</sup> See p.8 <https://www.aer.gov.au/system/files/AER%20-%20Determination%20-%20HumeLink%20-%20August%202022.pdf>

<sup>21</sup> See p. 5 [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/nem\\_esoo/2022/2022-electricity-statement-of-opportunities.pdf?la=en&hash=AED781BE4F1C692F59B1B9CB4EB30C4C](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2022/2022-electricity-statement-of-opportunities.pdf?la=en&hash=AED781BE4F1C692F59B1B9CB4EB30C4C)

And in the final 2022 ISP that<sup>22</sup>:

“A clear message from our stakeholders and recent market events is that our energy system transformation is accelerating and irreversible. Recent international events and Australian market events have further strengthened the case for the shift to renewables, and the ISP sets out a roadmap for the NEM that continues to prove itself against these realities. Investment in low-cost renewable energy, firming resources and essential transmission remains the best strategy to deliver affordable and reliable energy, protected against international market shocks. The NEM state government energy policies have long supported this investment, and the Commonwealth Government’s Rewiring the Nation policy will support the ISP roadmap’s timely and effective delivery.”

And now it seems AEMO is saying it wants to slow the transition down because it has significant benefits. This is the yellow part in Figure 8 for the step change scenario:



This table shows the significant benefits from delaying/avoided generation/storage costs that occur prior to commissioning in 2031-32 for the step change scenario start occurring in 2023-24. This is well before the project is expected to have even completed early works, let alone actually begin construction.

Cumulative PV	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Avoided unserved energy	3	3	5	5	5	4	3	2	2
Avoided REZ transmission capex	0	2	5	2	97	62	64	49	88
Avoided fuel costs	-1	-7	-13	-19	-29	-29	-36	-25	27
Avoided voluntary load curtailment	3	3	3	2	2	2	2	2	3
Avoided generation/storage costs (excl. fuel costs)	93	314	727	561	783	997	1,123	1,050	1,759

The benefits are lower with the progressive change scenario and higher with the hydrogen superpower scenario.

<sup>22</sup> See p. 3 <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en>

The table extracts the summary results from the model for the weighted benefits and NPV for Option 1 VNI West:

Costs		Benefits/avoided costs					NPV
Capex	Opex	Unservd energy	Avoided REZ capex	Fuel	Voluntary curtailment	Avoided generation/storage	
-1,536	-166	4	187	966	81	1228	687

This means that a substantial part of the net benefits are effectively driven by coal plant staying longer to defer renewables and gas before VNI West is even commissioned. The EY modelling says this is consistent with the 2021 ISP IASR and the announced closure dates for Eraring, Bayswater and Loy Yang<sup>23</sup>. EY also note that in the base case without VNI West<sup>24</sup>:

“Up to 2030, new wind and solar build is largely driven by the assumed state-based renewables energy targets. The forecast increasing renewable capacity leads to some earlier coal generation withdrawal in Queensland and NSW.”

But in Option 1<sup>25</sup>:

“Option 1 is forecast to initially result in wind capacity deferral, then LS battery and solar capacity deferral until the mid- 2030s. More black and brown coal generation is forecast though the early to mid-2020’s, which reduces the need for new capacity that would otherwise be needed without this augmentation. The whole-of-study optimisation mans that even with higher forecast coal generation in those years, the allocated carbon budget is met with Option 1, as it enables increased renewable generation in the years following augmentation. This is achieved through increased resource sharing and locational diversity of renewable resources as well as enabling higher utilisation of snowy hydroelectric generation, particularly Snowy 2.0, when this option is in place...

Specifically, wind builds are expected to be deferred in Central Went Orana, Darling Downs and Gippsland REZs. Up to around 1.3 GW LS battery in Victoria is also deferred in the early to mid-2030s, while solar capacity deferral is seen in Victoria, South Australia and Queensland”

What we have seen in recent years is what we refer to as the ‘balkanisation’ of the NEM. While in theory we may have a national market, State based schemes like the NSW Roadmap and Vic Grid are derogating away from national rules to fast track meeting State based renewable targets with State based renewable build to support regional development in that State.

Even if Queensland maroon solar electrons are cheaper than NSW blue solar electrons, the Roadmap legislation is all about building 12GW of renewable projects in NSW. Ditto for Victorian wind in NSW. The Vic Grid policy seems to have similar aims to the NSW roadmap – derogate away from national rules to fast track build renewable generation in Victoria to meet short and long term emission targets.

<sup>23</sup> See p. 11 [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/victorian\\_transmission/vni-west-rit-t/victoria-to-nsw-interconnector-west---vni-west---padr-market-modelling-report.pdf?la=en](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/victorian_transmission/vni-west-rit-t/victoria-to-nsw-interconnector-west---vni-west---padr-market-modelling-report.pdf?la=en)

<sup>24</sup> Ibid p.30

<sup>25</sup> Ibid p.35

The 2022 ISP summarised the business case for VNI West<sup>26</sup>:

“VNI West contributes roughly \$1.8 billion of the \$24.5 billion in net market benefits delivered by the ODP in the most likely scenario, and delivers value in all scenarios. It will increase access to Snowy 2.0’s deep storage and other firming capacity from interstate, support new VRE needed to replace coal-fired generation (particularly in the Murray River and Western Victoria REZs), provide greater system resilience to earlier than projected coal closures, secure the fuel cost savings of needing less gas for generation, and reduce VRE curtailment by sharing geographically diverse VRE.

Which seems to have no mention of ‘avoided generation/storage’.

### Questions

We propose a deep dive with stakeholders on the methodology used to justify this benefit stream to consider a range of issues including:

- How can benefits accrue before the project is even approved?
- Why was the NPV analysis ended in 2047-48, only 16 years after commissioning and two years before the end of ISP modelling?
- Why is a ‘less frenetic’ transition seen as a benefit for consumers when we are continually being told by AEMO and various governments that we need to transition quickly?
- How are the methodology and results consistent with the 2022 ISP?
- How are the methodology and results consistent with Federal and State Government energy and emissions policy?
- How are the methodology and results consistent with clear State government policies to fast track building State based renewable generation to meet 2030 interim emission targets?
- How the profile of emissions resulting from the deferral of renewables consistent with Governments 2030 emission targets and State based renewable energy targets for 2030?
- Do the proponents have a value of carbon emissions that is not time dependent i.e. is a tonne of increase in 2023-32 equivalent to a tonne of reduction post 2032?
- What evidence do the proponents have that renewable developers will defer their projects in anticipation of VNI West even before VNI West capex is approved by the AER?
- If the benefits of deferral are so great why not defer VNI West to beyond the 2031-32 commissioning date?
- What is the impact if Snowy 2.0 is delayed beyond the assumed commissioning date of December 2026<sup>27</sup>
- How are the results consistent with the AER CBA Guideline?

### **Section 9.5 - Sensitivity analysis**

We commented on the uncertain commissioning dates of associated projects – Project EnergyConnect, Western Renewables Link and Humelink.

<sup>26</sup> See p. 74 <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en>

<sup>27</sup> EY op cit p. 11



We recommend that sensitivity testing be undertaken on different timetables for these projects full commissioning.

### Question

- What methodology would the proponents propose to undertake this sensitivity testing?

### **Section 9.5.2 Sensitivity analysis on changes in capital costs of the credible options**

As noted above, the PADR claims that the capex cost estimate is  $\pm 30\%$ , although acknowledges that 20% of the values would lie outside of that range. The sensitivity testing on capex utilises the  $\pm 30\%$  variation. The 'boundary testing':

"...finds that the central estimate of network related capital costs (including land costs) would need to increase by around 45% in order for Option 1 to have negative net benefits on a weighted basis. AVP and Transgrid do not consider this likely given that the cost estimates have been prepared to a  $\pm 30\%$  degree of accuracy."

So it seems that the level of sensitivity is arrived at by assumption i.e. that the cost estimate is indeed accurate  $\pm 30\%$  estimate. Yet, as discussed above, the proponents acknowledge that 20% of the cost estimates can lie outside of this accuracy band<sup>28</sup>. And also, as noted above, the proponents do not have a route but seem to think that their  $\pm 30\%$  'including land costs' for a route they do not have provides justification for the level of sensitivity they have provided in the PADR.

### Questions

These are similar to those above referring to Section 8.1 Cost estimation

- What underpins your level of confidence that sensitivity testing of an increase in capex  $>30\%$  is not required?
- What is the reason you think a sensitivity testing of a capex cost  $<30\%$  is useful?

Do not hesitate to be in contact should you have any questions.

Kind regards,



Andrew Richards  
Chief Executive Officer

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<sup>28</sup> See footnote 126 on p. 71