Major Energy Users Inc.

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ISP Methodology
Issues Paper

The Major Energy Users is pleased to respond to the AEMO request for a submission to its issues paper related to its ISP methodology.

About the MEU

The MEU was established by very large energy using firms to represent their interests in the energy markets. With regard to all of the energy supplies they need to continue their operations and so supply to their customers, MEU members are vitally interested in four key aspects – the cost of the energy supplies, the reliability of delivery for those supplies, the quality of the delivered supplies and the long term security for the continuation of those supplies.

Many of the MEU members, being regionally based, are heavily dependent on local staff, suppliers of hardware and services, and have an obligation to represent the views of these local suppliers. With this in mind, the members of the MEU require their views to not only represent the views of large energy users, but also those interests of smaller power and gas users, and even at the residences used by their workforces that live in the regions where the members operate.

It is on this basis the MEU and its regional affiliates have been advocating in the interests of energy consumers for over 20 years and it has a high recognition as providing informed comment on energy issues from a consumer viewpoint with various regulators (ACCC, AEMO, AEMC, AER and regional regulators) and with governments.

As a general observation, the MEU recognises that AEMO has dedicated considerable effort into the preparation of the IASR and to a large extent the MEU accepts the work that is embedded in the report and its associated workbook.

While the MEU has expressed concern in other forums about the consultation process in the development of the ISP and the mechanisms to develop it, it also recognises that AEMO has already had the benefit of much of the MEU input and to reiterate its views would be duplicative. The MEU has also provided significant input to the development of many of the inputs to the ISP methodology through its active involvement in Forecasting Reference Group (FRG) and Planning Reference Group (PRG) deliberations and other forums related to the ISP over the years since the first ISP in 2018.

Further. The MEU has already responded to AEMO regarding its IASR and provided its views regarding it. This response to the IASR has many aspects which are relevant to this response to the ISP methodology, so the two MEU responses (to the IASR and ISP methodology) are complementary and should be assessed together.

There are many elements of the proposed ISP methodology that the MEU supports. Below we provide a view on those aspects where the MEU has concerns about the proposed methodology.

Modelling methodology

The proposed methodology does not address certain aspects, introduces inconsistencies and excessive conservatism:

Capacity outlook modelling

- The commercial feasibility of generators continuing to stay in operation when they are making a loss due to low market prices is not addressed.
- The “reference years” (eg first dot point in section 2.2.2 and elsewhere) are not defined
- Climate change is more than temperature and rainfall impacts and includes other outcomes such as bushfire risk (and shutting down elements of the networks) and the impacts on generation (eg hailstorm damage to solar panels)

Seasonal ratings

- 10% PoE is proposed for the peak summer demand capacity but elsewhere firm capacity is defined as demand in the top 5 days in the year.

Reserve modelling

- Generator forced outages need to be examined and discounted for non-recurrent causes of outages to reflect reasonable availability.
- There is no explanation why 85th percentile is used for firm rating for wind and solar contribution rather than using 100% when it is considered that using the top 10% of half hour periods already provides a discount on VRE availability. The AEMO approach adds further conservatism that is unnecessary.

- The assessment of peak demand needs to reflect the presence of DSP which is offered (notionally) in the form of “negawatts” when there is voluntary load shedding at high prices. The current approach used by AEMO in its forecasting to incorporate these “negawatts” is too conservative.

Sub-regions

- The MEU agrees that sub-regional assessment will be beneficial but raises the following issues.
    - Why is Canberra considered to be the centre of the southern NSW sub-region when Yass is the focus of supply and demand in this sub-region?
    - When forecasting the load in a sub-region, this should be calculated on a bottom-up approach. The proposed approach does not reflect the potential of peak demands occurring at different times in the sub-regions.
    - The proposed approach for assessing sub-region demands should also look to reflect that some end users will provide voluntary load shedding with high prices.
    - While is accepted there is increased complexity in adding thermal and storage development options in sub-regions, it is important that these be reflected in the forecasts.
    - It is important to assess the impacts of intra-regional transmission transfer capacity in assessment of movements between sub-regions.

Inter-connector losses

- Intra-regional transfer losses need to reflect that transmission between regions is actually between a region and an adjacent sub-region (eg inter-regional flows from Victoria actually go to the southern sub-region of NSW, not the NSW region, and flows from SA to NSW will terminate at the southern sub-region of NSW at Wagga/Yass).
- Loss factors need to be calculated for sub-regions, and not referenced to the state regional node.

Hydrogen

- The MEU is not convinced that AEMO should be trying to second guess what hydrogen developers might or might not do. These decisions will be commercially driven (not unlike other end users) and the development of hydrogen assets will be driven by more than what the NEM might need. AEMO doesn’t try to plan other end user activities so it should not attempt to do this for hydrogen.
- Hydrogen might not be stored in gas pipelines, especially if used for other purposes. Some might be injected into gas pipelines, but this is unlikely to be the prime use of hydrogen. It needs to be recognised that adding hydrogen to gas steel pipelines can lead to embrittlement and does lead to a need for pressure reduction, reducing the transport capacity of the pipeline.
- The MEU is not sure whether the most economical approach is to locate elecrolysers at the point of electricity generation (recognising water limitations and then transporting hydrogen) or moving electricity to where the electorolyser is best located for other reasons. AEMO should not try and double guess the best approach as this may be dependent on the developer of the hydrogen assets.

Hybrid VRE and storage

- Colocation of battery and generation potentially provides a lower cost solution for the NEM (ie is more efficient) as this could lead to lower capacity powerlines in not trying to manage all of the output for a limited time), but smoothing the output ie needing lesser capacity power lines by transporting a lower output for longer times
- Colocation of VRE and storage should be encouraged and not left to chance.

REZ network expansion costing

- The MEU does not agree that the cost of networks to serve REZs will increase linearly with capacity. MEU members tend to use the more common approach of cost increasing with capacity to the power 0.7.

Power system security costs

- There is a fundamental issue with regard to system security costs - and this relates to who pays. If a generator is aware that they will incur these costs, then they might make different decisions which will impact the design considerations by AEMO eg if generators pick up the costs for system strength then they might consider relocating or buying inverters that don't cause the SS issues. In contrast, if consumers are allocated the costs, then VRE generators will look for the lowest cost for their generation. This dichotomy needs to be recognised in the modelling.

Ramp rates

- AEMO proposes to use VRE ramp rates as determined from AEMO studies. However, these ramp rates need to be assessed in relation to ramp rates offered by other generation, including VRE generation

Infrastructure delivery

- The ISP program should be structured such that having multiple transmission projects occurring at the same time must be minimised, recognising that TNSPs and DNSPs will be continuing with their projects at the same time. Having concurrent projects will unnecessarily increase the cost of all projects – smoothing the delivery of projects will result in lower costs for consumers.
- It will be difficult to coordinate with other infrastructure projects outside the NEM so liaison with governments should be implemented to maximise smoothing.

Cos benefit analysis

- An amendment that must be considered is the selection of discount rates to reflect the uncertainty of the expected cash flows in that the cash flow for a network solution would have low risk (reflecting the WACC used for network regulation) but a non-network solution should have a higher discount rate to reflect the increase in risk unless the revenue is guaranteed for the long term. Expected benefits will have a much higher discount rate due to the uncertainty of these benefits occurring, especially deep into the future. This point is expanded in the MEU response to the IASR consultation. The ISP guidelines require AEMO to explain how it sets the discount rate and why this rate reflects the risk profile

of the inputs being used. The methodology needs to be amended to include the derivation and appropriateness of the discount rates used.

- A key criticism of the proposed approach is that there needs to be defined need. In a number of proposed projects, AEMO has not defined a specific need but has allowed need to be flexible, changing with the benefits of each option considered. By not defining a clear need, this discriminates against non-network solutions as the non-network solution can only be developed against a specific need. Therefore, a defined need must be stated and all options considered against this and benefits arising from other network solutions have to be excluded or the ODP redefined so that non-network solutions can be developed to address any other benefits of the wider network solution
- How is the optimisation of land value done? In the case of wind, land optimisation is less critical than in the case of solar so is this reality recognised?
- Voluntary load shedding. It is not clear in the methodology how this is incorporated, so the issue needs to be expanded to include direction on what is done and how.
- The annuity approach is not supported. A solution that is supported, is to generate a NPV for the capital works (using a discount rate appropriate to the risks faced) with a separate NPV for the benefits using a discount rate reflective of the risks and assumptions made in developing the benefits. A NPV approach effectively includes for the terminal value.
    - In the case of new generation assets, these have an expected life potentially shorter than the lives of new network assets and therefore the benefits of this new generation could terminate before the network asset reaches full return of the asset value. A 20-year window could see the network asset depreciated by a third, but the generating assets providing the benefit could be fully depreciated over this period. It is possible that the generating asset might be replaced but this is not as certain as the network asset remaining, thereby costing consumers though funding redundant network assets.
    - Benefits stretching well into the future have a high likelihood of not occurring or being delivered much later than forecast, increasing the unreliability of the cash flow to consumers. To manage this differential requires a different discount rate to reflect this uncertainty.
- The MEU notes the discussion regarding the ODP/LWR approach versus the scenario approach Using both methods seems reasonable, then assessing the outcomes and, if a change from the mandated approach is preferred, then an explanation must be provided.
- In principle, the TOOT approach is sensible and supported. As with all such techniques, it is how the process is conducted and assumptions made that delivers the best outcome. Assumptions need to be fully explained in the TOOT analysis for each actionable project. In particular, it needs to be explained that when undertaking the TOOT analysis, if a specific project is shown to have a net negative benefit but still contributes to a net positive benefit for the ISP as a whole, then the specific project will not be implemented.

Other observations

The MEU has noted other aspects that are either absent from the methodology or require better explanation as to how the methodology will address the issue.

- There is no clarity on how the methodology will interact with various state-based approaches that will impact the ISP. Specifically, the MEU points to
    - The NSW decision for its infrastructure road map
    - The Victorian VicGrid initiative
    - The impacts of the Tasmanian government decision to provide 300% VRE, necessitating export of considerable amounts of generation from the state
- There needs to be more clarity on how AEMO will accommodate the increasing amounts of DER that are being generated deep within the distribution networks.
- A better definition is needed of what is required for each of the ISP projects proposed. Eg the new VNI is proposed on the basis of a need to manage the exit of Yallourn power station, yet the proposed ISP solutions go far beyond this express need and include other benefits such as connecting renewable energy zones to allow more VRE to connect to the NEM. While the MEU does not expressly discount the benefits of connecting more VRE, it points out that the approach excludes the ability of other parties to provide their solutions to both the expressed need and to advise on their ability deliver the additional benefits that might occur from the wider network solution. The current approach leads to the only solution being an augmentation (usually at great cost to consumers) of the network. The ISP analysis program does not necessarily lead to the least cost solution or the least regrets solution – it only generates the least cost/regrets **network** solution.
- The methodology should reflect that there is continual augmentation of the transmission and distribution networks occurring and these will impact the ISP as they occur. The MEU considers that the methodology needs to accommodate the effects of these other augmentations on a rolling basis and for the ISP to be updated more regularly than every 2 years. The MEU considers that updates do not necessarily require the ISP process to be carried out more frequently than the 2-year cycle, but for AEMO to perhaps re-run elements to reflect changes that are occurring
- There is no mention of the likelihood of increasing numbers of micro-grids being implemented and the impact these might have on the ISP, especially where VRE is located near to where these micro-grids might be established.
- The MEU considers that when running the ISP program, advising the upper limit of cost for an augmentation (ie the cost at which the project is unviable) is sound, despite concerns that by doing so, this might incentive networks to overstate capital costs.
- The MEU considers that AEMO must improve its capital costing accuracy for the ISP and state clearly where the capital costing comes from (eg from AEMO internal costs or from a TNSP PACR. The MEU supports the AEMO decision to establish a costing data base as a way of improving its project costing.

- The methodology must recognise that there is a need for scenario development weightings. While the actual weightings would be included in the IASR, the process for allocation of weightings needs to be included in the methodology.

Gas price modelling

In its response to the IASR, the MEU raised concerns about the inconsistencies inherent in the IASR spreadsheets in relation to setting future gas prices. The MEU recognises that forecasting future gas prices is quite challenging. Despite this, the methodology should provide much greater clarity on how gas price modelling will be carried out and how this will address inconsistencies between different sources of information.

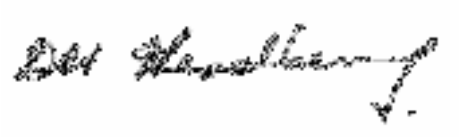
The MEU also notes the inherent contradiction observed regarding drivers of gas availability and use, affecting the price. The state governments are driving end users in their regions to reduce the use of fossils fuels in order to reduce emissions whereas the Federal government is advocating the greater use of gas as a firming fuel, driving emissions up.

The MEU notes that gas price modelling is primarily an issue of assessing future benefits of a network solution (eg by quantifying the benefits of less gas being burned to create electricity). It is clear that the savings from generating electricity from sources other than gas are consistently one of the highest value benefits identified in the ISP process. Therefore, it is imperative that forecast gas prices are as accurate as possible.

The MEU welcomes the decision by AEMO to have further stakeholder consultation on gas price development and considers that this should occur as soon as possible. The consultation should encompass an explanation as to how Lewis Grey Advisory developed its forecast, a comparison of this with other measures and development of the range of sensitivities that might apply to the assessment.

The MEU is happy to discuss the issues further with you if needed or if you feel that any expansion on the above comments is necessary. If so, please contact the undersigned at davidheadberry@bigpond.com or 0417 397 056

Yours faithfully



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