MM Technology
Bridging The Knowledge Gap
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MM TECHNOLOGY'S RESPONSE TO AEMO'S ISP METHODOLOGY ISSUES PAPER

1. Introduction

We appreciate the opportunity to comment on AEMO's ISP 2022 proposed analysis methodology. In keeping with the preceding AEMO ISP 2022 Assumptions Paper, we believe that the simpler and clearer the approach, the better.

In both cases we believe the objective of both papers should be stated, particularly as we are in a transition to a higher percentage of renewable energy penetration in the NEM.

AEMO's operational "de etre" may need to be restated and possibly COAG encouraged to restate it; if it could agree on a single way forward rather than the fragmented path we have before us now.

Given there is a retirement path ahead of the coal fired fleet, the emission reduction objective of the government is largely looking after itself, then the longer term objective should clearly be to maintain a reliable, secure and efficient NEM grid supplying reasonably priced electricity, whilst still providing economic returns to those companies that invest in its growth and continuity of operations. This is the difficult to resolve conundrum facing the NEM, Federal and State Governments, electricity consumers and industry investors.

Both AEMO papers are deficient in not mentioning or taking into account the NEM market and the major influence it has on all investment decisions. The market and the ESB's seeming believe that it cannot be improved before 2025 will leave Australia worse off by earlier than necessary retirement of the coal fired power stations before we have renewables storage beyond batteries, and effective grid voltage and control resolved.

The remainder of this response follows the order followed in the AEMO ISP2020 Methodology Paper.

2. Responses to Matters for Consultation

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- Do you agree with the above proposal to simplify the Advanced and Maturing categories currently in Generation Information publication into a single Anticipated category?

  Yes

- What is your view on the appropriateness of the current Generation Information survey questions? Please provide any suggestions for other questions that would better determine a project's progress towards meeting the commitment criteria.

  Recommend that the two last questions in planning should be relocated under Land

- What is your view on how the announcement and/or commitment of government-awarded funding should influence the commitment status?

  Should simply be included under Finance. We have seen recent examples that government funding award does not confirm project approval. We have also seen government funding announced but not legislated, ie the Federal Government's current desire to include gas in Arena's remit.

- Do you agree with the proposal that Anticipated projects must have provided project information within the past 6 months in order to be "progressing" and therefore included in the ISP? Alternatively, in what ways could AEMO improve the regularity by which a project's status is updated by project proponents to be satisfied that the project is progressing?

  By asking project proponents and their NSP to report against previously agreed "project milestones".

- Do you agree with AEMO's approach to determining anticipated network projects for the ISP?

  Yes but this has to be a two way process with AEMO giving proponents and or their NSP feedback on the status of their likely access to the NEM

Matters for consultation

- Do you agree that the proposed approach represents an appropriate balance between modelling complexity and the expected contribution from generators during peak and typical conditions?

  No real issues with the approach, however in the coming renewables world we also need to understand how long the generating source will contribute to - total available generating capacity is not enough alone!

  I would like a better understanding of how this methodology integrates or builds on the RERT.

- Do you have any alternative suggestions for methodologies or assumptions that better reflect the contribution to peak demand from VRE, in particular how this contribution evolves as the penetration of VRE increases?

  See above. We have to know the real ongoing time performance of storage capacity bidding into the NEM.

  Our view is that the renewables market is going to have to pay premium for renewables storage and probably greater premium for longer storage capacity .

  It will seem to be a tragedy in future that the ESB does not see now that the fossil fired fleet oil, gas and coal should receive a premium payment for what they contribute to the current market in relation to renewables back-up, voltage maintenance and total system control.

- Do you agree with AEMO's proposed approach to determining firm contribution factors for storage by approximating the duration of peak demand events? Do you have any proposals for how AEMO may otherwise account for the contribution to firm capacity provided by storage technologies?

  "One possible method is to determine a reasonable approximation of the duration of peak demand events and to adjust the firmness to reflect the contribution that could be provided across this period; for example, if the average duration of peak demands was determined to be approximately three hours, a 1 megawatt (MW)/2 megawatt hours (MWh) battery would be allocated a firm contribution of 66.7%."

  We believe that the above approach/suggested methodology is wrong ie multiplying actual capacity by time period of storage. We recommend the actual capacity by a defined time period ie we believe in the new market 'time slot" bids have to be for both capacity and a time period of availability.

- Can you identify any issues with AEMO's proposal to move from a regional topology to a sub-regional topology for the capacity outlook model?
- Do you agree that the considerations listed above used to determine sub-regions are appropriate? Are there other considerations in the selection of sub-regions AEMO should be looking at?
- Does the methodology described above to forecast demand at a sub-regional level seem appropriate for the sub-regional model?

No MM Technology comment or contribution to the three above AEMO questions.

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- AEMO welcomes consultation on what matters should be considered in determining the location of storage and traditional thermal generators in the power system.

  We are seeing lower wholesale prices in the NEM as two real future costs are not yet materially flowing through to domestic price; these are firstly the cost of renewables storage and the cost of transmission into the NEM from more distributed VRE as well as additional major links between regions.

  One way of minimising future storage costs will be to locate battery storage facilities on the sites of retiring power stations as AGL is/was proposing to do with a 500MW battery at Liddell.

  As we move into other storage technologies for medium and deeper time periods new transmission lines and consequently costs may come into play.

  Assuming the retiring power stations are inland and water cooled, then medium term storage based on electrolysis of water and hydrogen as the energy source, could also be located at retiring power station sites as the cooling water is no longer required and could be used to make hydrogen.

- AEMO proposes to model transfer limits that represent a number of system conditions. Please provide feedback on the types of system conditions that should be represented, and why.

  MMTechnology is not sure we are answering the question but in ISP2020, the future estimate for the dispatchable power requirement is far too wide and the coming round of modelling needs to improve the estimate. The risk here is not even; too much dispatchable capacity is not really an issue, but not enough can bring the whole system down.

  We have a view that RERT costs should trend toward zero over time and that reduction should go into the modelling of the dispatchable energy requirement -probably on a region by region basis.

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- AEMO is interested to understand perspectives on how to approximate future inter-regional losses as the network is modified.
- AEMO welcomes feedback on other matters related to losses not covered in the above.

No MM Technology comment or contribution to the two above AEMO questions.

Matters for consultation Page 25

- Considering the limitations in the proposed implementation, are there prudent amendments to the proposed method that you consider would increase the effectiveness of the modelling approach?

  Whilst MM Technology has supported the inclusion of hydrogen in ISP 2022 it is currently still some years off and firstly should be looked at by AEMO as a renewables storage medium and less so as an export opportunity at this time.

  We have a large learning curve to get through and in our view the infrastructure and skills set required by hydrogen should be built up using "blue hydrogen" which is much cheaper to produce.

- What approach, if any, should AEMO consider in capturing the potential different characteristics between hydrogen export ports?

  "There is relatively limited consideration of water limitations/costs at this stage."

  AEMO would considerably reduce the options for consideration if water requirements were included.

  9.1 litres of pure fresh water are required per kg of hydrogen produced by the electrolysis process taking into account the fact that Australia is the World's driest continent, then the AEMO work should concentrate on Tasmania and North Queensland in general terms. It is noted that serious players like FMG are already working on hydrogen projects in Tasmania.

- What additional considerations should be considered in the hydrogen methodology? Is the complexity of the approach appropriate, or should AEMO reduce the granularity (and therefore accuracy) of other parts of the capacity outlook models in order to increase the sophistication of this component?

  MM Technology recommends keeping it simple and more granular for the next two ISP's follow what is being done by companies "walking the walk" and using a high proportion of their own funds.

Matters for consultation Page 25

- What other options could AEMO consider to better reflect the potential benefits of the co-location of storage and VRE?

  See above savings in transmission costs and losses minimisation.

Matters for consultation Page 28

- Are there other factors which need to be considered for the REZ resource limit?
- Is the penalty factor approach with soft land use limits appropriate?

  No MM Technology comment or contribution.

Matters for consultation Page 28

- AEMO welcomes ideas on what factors should be considered in the REZ network hosting capacity for the capacity outlook modelling, including whether an acceptable level of curtailment should be used.

  No MM Technology comment or contribution.

Matters for consultation

- Without care, this approach of linearising REZ expansion costs can over or understate the true cost of network expansion required for a given amount of REZ generation development. AEMO welcomes feedback on any possible improvements or refinements.

  No MM Technology comment or contribution.

Matters for consultation Page 30

- Are there any important factors that need to be considered when making assumptions to simplify the transmission expansion costs for the Export Superpower scenario?

  Firstly the direct export of energy proposals like SunCable should not be a planning consideration for AEMO, they should be self-supporting inclusive of their constructions costs if they reach that point.

Secondly in respect of hydrogen export, take pure water cost and availability into account, model the doers and not the talkers, and those using own company expenditure. Accept that Australia has a learning curve.

Thirdly green steel is predicted to be 2 to 3 times the cost of using coke and will need ten years to develop - follow developments in regard to European trial plants.

- Do you agree with the direction being explored for simplifying assumptions for the Export Superpower Scenario?

  See above responses particularly for the next couple of ISP's say 2022 and 2024.

  The modelling focus should be on how we effectively replace the retiring coal fired power stations (90%) growth when it happens (5%) and other hydrogen (5%) in terms of modelling and focus.

Matters for consultation Page 34

- Do you agree with the proposed assumptions regarding which system security costs are to be accounted for in the cost benefit assessments?

  Yes

- Are the proposed assumptions regarding the need for high-level planning assessments to model system security impacts reasonable?

  Yes

- Do the existing methodologies and proposed improvements capture the level of detail required to ensure the treatment of system security costs is transparent? If not, what aspects still need further improvement?

  We believe so.

Matters for consultation Page 35

- How might the 2022 ISP, or subsequent ISPs, consider smoothing the delivery of multiple simultaneous large ISP infrastructure projects – especially considering the relationship with infrastructure projects outside the energy sector?

  No MM Technology comment or contribution.

Matters for consultation Page 35

- What additional matters should AEMO consider regarding the interplay between distribution and transmission networks?

  No MM Technology comment or contribution.

Matters for consultation Page 38

- Is the approach described for selecting DPs appropriate? If not, what improvements could be made to this approach?
- Does the approach described fully capture option value and flexibility considerations?
- What approaches are possible to improve the consideration of non-network options in the assessment?

  No MM Technology comment or contribution.

Matters for consultation Page 39

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- What approaches are possible to improve the consideration of non-network options in the assessment?

  No MM Technology comment or contribution.

Matters for consultation Page 40

- Is the approach described for the identification and quantification of costs and market benefits appropriate?

  No MM Technology comment or contribution.

Matters for consultation

- Which approach do you consider most appropriate for selecting the ODP and why? What do you consider to be the benefits of that approach relative to the alternative?
- Would another approach provide a more appropriate, considered framework for assessing benefits and investment risks?
- Do you consider that the risk appetite for consumers is such that a solution that minimises risks under some conditions may be preferred over a solution that delivers the lowest expected cost? Would you support the inclusion of a condition that excludes LWR outcomes that result in expected costs exceeding the scenario-weighted approach by some threshold?

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- What tests do you consider to be most critical in testing the ODP?
- Is the methodology described for the TOOT analysis appropriate? What improvements would you propose for this approach?

No MM Technology comment or contribution to the final four above AEMO questions.

Thankyou for the opportunity to comment on the analysis methodology to be used in ISP2022

We have no issue with the publication by AEMO of this response.

Yours sincerely

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