Australia Energy Market Operator
By email: ISP@aemo.com.au

Tuesday, 30 January 2018

Deakin University Response to Preliminary Questions - AEMO Integrated System Plan

Deakin University welcomes the opportunity to participate in the consultation process for development of the inaugural Integrated System Plan (ISP) for the National Electricity Market (NEM).

A field of particular strength within Deakin University is development and application of multi-layered models of complex infrastructure systems to increase productivity, better manage risk and deliver broad social, environmental and economic benefits.

Successful application of the Deakin University capability in the water and energy sectors has demonstrated benefits to industry through clarification of intended and unintended consequences, establishment of a decision-making framework across infrastructure systems and the unique ability to incorporate non-technical parameters into this framework. By using this methodology, complexity becomes obvious but so do the mechanisms to elicit input from, and communicate to, non-technical stakeholders.

Our response to questions 1.1 and 1.2 follows. The remaining sections will be addressed in a subsequent document. Please contact me if anything in this response requires clarification or about Deakin University's capability generally.

Yours sincerely,

Dr Adrian Panow
Director, Deakin Energy

Stakeholder input to modelling (questions 1.1 and 1.2)

1.1 The material questions the ISP seeks to address are in Section 1.3.1. Are there any other questions the ISP should address?

With respect to the first bullet point – *"What is the best way to achieve the policy objectives of affordable, reliable, secure power and meeting emissions targets?",* consideration should be given to non-technical issues. Effective communication to political, commercial and community stakeholders is essential to ensure proposed technical solutions are able to be implemented. Furthermore, affordability of public good outcomes and/or outcomes with broad general benefit is a complex question which should be quantified and communicated specifically.

Additional questions:

- **What communication needs to occur to remove barriers to implementation?**
- **How can affordability be defined and quantified to ensure that public good and general benefits can be weighted appropriately in investment decision systems?**

A robust integrated system plan needs to take into account non-energy infrastructure. It must also have the capability to represent the system dynamically and what occurs at nodes, i.e. points at which infrastructure systems intersect.

Additional question:

- **What other infrastructure systems need to be considered when developing the ISP?**

With respect to the final bullet point – "*What is the optimal balance between the lowest-cost pathway and having the optionality to ramp up new development if required by circumstances, such as earlier than expected generator retirements, lower than expected DER uptake/orchestration, or higher than expected development of renewable generators?"*, the dynamic nature of infrastructure must be able to be accommodated by the methodology underpinning the ISP.

Additional question:

- **Do traditional infrastructure planning approaches allow for the dynamic nature of the NEM?**

1.2 The scenarios the modelling will use to inform the ISP are outlined in Section 1.4. Recognising the time limitations to produce the first ISP in mid-2018, are these suitable scenarios to address at a high level? Should these be expanded in more detailed analysis following the first high level ISP?

There are likely scenarios and uncertainties that are specific to regions of the NEM. It may, therefore, be possible that some regions will be in one category whilst others are more appropriately described in another scenario.

It is recommended that the scenarios consider such circumstances and commentary is made about the robustness of the ISP and its ability to accommodate a non-homogeneous system.