**AEMO DRAFT 2021 IASR Report**
**SUBMISSION**

## GENERAL

The IASR 2021 is considered to be an effective document outlining necessary conditions for predicting changes in the power system with present knowledge. Two matters are set out in the scope for consideration followed by comment where requested and appropriate.

### Scope

The forecasting concept and methodology has generally been based on ensuring likely maximum load conditions were met in a timely manner. The changing nature of the grid has introduced a new requirement concerning the stability of the grid, namely identifying likely minimum load stability.

In addition, whereas ensuring there was adequate generation to meet likely maximum load we now have an excess of power available that must be curtailed to maintain system stability.

This excess will be harnessed at some time in the future in some form of secondary market between generators and customers. To this end the available excess power needs to be identified, recorded and eventually forecast so that this market between generator and customer, where there is transmission capacity available, can be identified and utilized.

## SPECIFIC

## Section 2 scenarios

### Scenario overview

The five core principles are considered appropriate for this study. They assume that an appropriate level of investment in the necessary technologies will be available from the government or private sector precisely when required over a 20-year period.

They also do not identify the two emerging markets, one for power and the other for system stability and the competition between these for necessary capital investment.

Maintaining this necessary level of investment interest is not the subject of this process but must be addressed elsewhere.

### Consultation process

While not extensive or strictly broad the consultation process was superior to previous ones and adequate for its purpose to identify potential scenarios.

### Comment on specific scenarios

Central scenario
This provides an acceptable starting point.

Sustainable growth scenario
This is considered one of the more likely developments.

Slow growth scenario

This is considered one of the more likely developments.

Diversified technology scenario
This gas led scenario will not come about unless Victoria, which has presumed low-cost gas, decides to develop it. This scenario would simplify the eventual power system transition for AEMO.

Export superpower scenario
This scenario is considered unlikely unless a South East Asian consortium invests strongly in its development.

**Risks**
As requested, possible risks are identified below:

| | Importance | Likelihood |
|---|---|---|
| Victoria coal closure | 2 | highest |
| NSW coal closure | highest. | 2 |
| Marinus late. | 4 | 4 |
| Central DER uptake. | 3 | 3 |
| Copperstring | 5 | 5 |

Timely, adequate investment is considered a far greater overall risk than any of the above over the period.

**Section 3 Engagement**
The present process adopted for the FRG is for the relevant AEMO expert to prepare a document/slides presentation for discussion. In general, this works well. However, at times there is insufficient time for robust discussion. Particularly for new or contentious topics such as development of "EV demand" a few judicially selected rabble-rousers could be identified providing broader discussions at the early stages of developing a program.

A number of factors concerning hydrogen and its place in forecasts might be a useful start.

**Section 4 Inputs/assumptions**

**Magnitude and variability of component loads**
It is felt that a simple graph, perhaps log scaled, showing the magnitude and variability of the various components of load would give a better sense of proportion in discussions.

**Public policy settings**
These Australian State policies should be included across all settings.

International policy settings should at least be noted. For instance, limitations on the export of coal/LNG will make these significantly cheaper within Australia affecting all scenarios.

**International scenarios**
I do not think the scenarios should be aligned with international ones. It is difficult enough to cope with the various federal/state scenario aspirations. If the federal government aligns with one particular international scenario AEMO should follow. The likelihood of this is presently obscure.

This comment applies to state-based emission targets until legislated.

**Consumption and demand**
These are in line with expectations. The major change over the period will be the energy utilized in fossil-based transport being transferred to the electricity sector at an unknown rate.

**Economic forecasts**
The economic forecasts are considered appropriate. The greatest disturbance would be the export of coal and LNG being affected by climate action internationally, reducing Australia's trade income significantly.

**Retirement and refurbishment**
The proposals by AEMO are considered appropriate.

**Fuel prices**
It is considered likely that various economies will reduce/stop their import of coal/ LNG from Australia, resulting in greater availability/reduced price for these resources over time in the Australian domestic market.

**Gas modelling**
Gas is traded by volume at a specific pressure but utilized on a heating value basis. The addition of a proportion of hydrogen alters this linkage and needs to considered. The eventual use of greater hydrogen proportions will exacerbate this problem and the use of pure hydrogen is quite different. There may need to be identifiably different "gas" definitions in the future.

**Hydrogen**
Hydrogen should only be modelled in the Export Superpower scenario. Present hydrogen distribution systems in other economies are relatively small diameter/high pressure systems. It is unlikely that this type of system will replace the existing large diameter low pressure pipe system presently in use by 2045.

With respect to hydrogen storage the proposed Kawasaki hydrogen tanker has a capacity of 40,000 cubic metres of liquid hydrogen.

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