

A large green 'X' shape is centered on a white background, forming a frame for the text. The 'X' is composed of two overlapping triangles that meet at the center.

**Consultation  
Draft 2023 IASR**

**Submission  
in response**

**John Diesendorf  
Grid Adviser**

**ABN 27 303 690 794**

**16 February 2023**

**[john.diesendorf@gmail.com](mailto:john.diesendorf@gmail.com)**

**+61 416 281 620**

## 1. Scenarios

### 1.1 Three Scenarios

The **1.5°C Green Energy Exports** scenario is of critical importance and this submission proposes that its ambition be further increased. This scenario must accelerate the transition to 200% renewable energy then 300% etc with green energy exports, rapid greening of existing industries and rapid emergence of new clean green industries supplying both domestic and international markets. It must lead to major strengthening of grid supply to emerging large loads at significant ports.

This submission does not see sufficient value in having two scenarios targeting 1.8°C. It is proposed that the **1.8°C Orchestrated Step Change** scenario and the **1.8°C Diverse Step Change** scenario be combined and that the orchestration be focused on rapid grid development to ready the NEM for further advancement of fossil fuel generation retirement and compatibility with the 1.5°C scenario but on a somewhat slower rate of change due to resource and supply chain constraints.

The **2.6°C Progressive Step Change** scenario can continue as proposed in the draft.

### 1.2 Scenario names

The following are suggested for consideration:

1.5°C Green Energy Exports >>> **Powering Green Energy and Industry**

1.8°C Orchestrated Step Change >>> **Accelerated NEM Supergrid**

1.8°C Diverse Step Change >>> **Scrap this scenario** and build it into *Accelerated NEM Supergrid*

2.6°C Progressive Step Change >>> **Progressive step change.**

## 2. Zero Emissions

All scenarios target net zero in 2050, but differ in 2030 targets.

Notwithstanding that the quantum of green energy will be greater, it does not make sense for the more aggressive transformation scenarios to have the same net zero target as the least aggressive scenario as these targets will drive the grid expansion but targeting 2050 will allow supply chain and skilled worker resources to go elsewhere. It will tend to hold back the transformation and imperil the clean industry and green manufacturing revolution.

It is proposed that the 1.5°C scenario, **Powering Green Energy and Industry** target Net Zero in 2040.

It is proposed that the 1.8°C scenario, **Accelerated NEM Supergrid** target Net Zero in 2045.

### 3. Offshore Wind and Priority REZ development

It is proposed that the the 1.5 °C scenario, **Powering Green Energy and Industry** assume major **offshore wind** commissioning throughout the 2030s and **additional priority onshore REZs** to be connected in the late 2030s and early 2040s.

### 4. Risk

The treatment of risk in the Draft 2023 IASR is not appropriate to the rapid transformation of energy sources for electricity. The ISP must address this in a timely manner. The risks considered are those affecting optimisation of an incremental development process. This not transformation.

The four biggest risks are:

- Lack of sufficient skilled engineers and workers to deliver the plan
- Failure to gain social licence for significant parts of the plan
- Supply chain risks
- Failure of contractors to deliver major projects on schedule.

These risks are the ones to address as a critical priority and they each need to be addressed by action of state and federal governments.

Even if the above risks are addressed rapidly and systematically, the risk of one major project or of multiple projects failing to be completed on schedule can only be addressed by planning for more projects and scheduling earlier completions of grid augmentations wherever possible.

What if Snowy 2.0 tunnelling fails to meet targets and delays Snowy 2.0 by several years?

What if Marinus link fails to contract the needed cable laying ship(s) or some incident at sea prevents the contract being fulfilled on time?

What if 500kV lines in some REZ face stiff community or politically motivated opposition and fail to gain development consents, or if approved projects are delayed by court actions?

### 5. Overlaying a 500kV supergrid

A 500kV grid will need to be constructed and expanded to address the greatly increased demand for electricity rightly foreseen in the ISP. The existing EHV grids will also need expansion to deliver power from 500kV hubs to load areas, existing and new, and to provide connection points for onshore generators and offshore wind.

Reconstruction of critical existing single circuit 330kV/275kV/220kV lines as double circuits will be required ahead of generation connections to enable the long outages needed for reconstruction of other lines. Reinforcements of the existing grid and modifications to address changed load flow

requirements are needed. Widening of the easements of existing lines to prepare for reconstruction at a higher voltage must be prioritised and actioned early to reduce the lead times of the later reconstructions.

Land acquisitions for future requirements must be actioned early. For example reserving sites for new major substations near ports or to receive the generation of offshore wind.

It is imperative that downstream grid augmentations are planned well in advance and preliminary works actioned early. It may not be appropriate for the ISP to spell all this out in detail, but the ISP should indicate in broad terms the generic requirements associated with each ISP actionable project.

Finally I draw attention to the need a long term vision for the future grid. In this connection I attach my submission made in connection with the Illawarra REZ Declaration which includes a 15 year look ahead concept for the future 500kV grid expansion in New South Wales.

---

jd