312 Smith Street
Collingwood, Victoria 3055
(03) 9419 8700
www.melbournefoe.org.au/

# Friends of the Earth Melbourne Submission to AEMO ISP Inputs Assumptions Scenarios

## Submitted: 17.10.2023

Friends of the Earth (Melbourne) Inc. is a membership-based environmental justice organisation which has been active in the state of Victoria for more than 45 years. Friends of the Earth works alongside communities, businesses and unions to advocate for a just energy transition and ambitious action on climate change in Victoria, and is pleased for the opportunity to provide input to AEMO's Draft 2023 Inputs, Assumptions and Scenarios Report (IASR)

We would like to highlight a number of issues, and make a series of recommendations for strengthening the next iteration of the AEMO's Integrated System Plan (ISP).

## Aligning the AEMO ISP with the Paris Climate Agreement

As a signatory to the Paris Climate Agreement, Australia is required to pursue efforts to limit global warming to a maximum temperature rise of 1.5C. The legally binding treaty works on the basis of five- year cycles of increasingly ambitious climate action.

It is unclear why the 2023 draft IASR has modelled less 1.5C scenarios and sensitivities than the 2021 ISP, especially when the policy making environment requires governments to ratchet up ambition on emissions reduction over time.

The inclusion of three scenarios that include global temperature rise beyond 1.5C seems to be based on an assumption that Australia will not pursue action on climate change commensurate with its international obligations, despite multiple governments introducing legislation requiring them to do so, announcing a number of energy policies and delivering sectoral strategies designed to achieve these goals.

This is flawed and places the 2023 draft IASR out of step with contemporary climate and energy policy. This puts the utility of the next ISP for governments, investors, businesses and the community at risk.

This flaw is best rectified by modelling 1.5C across all scenarios.

The current approach of only modelling a single 1.5C scenario under '*1.5°C Green Energy Exports'* is fraught. There are many uncertainties around the establishment of a renewable energy export industry, and governments will need to pursue domestic focussed decarbonisation strategies whether a renewable energy export industry is achieved or not.

At the least AEMO can model a 1.5C scenario with a much stronger focus on domestic electrification. The simplest way to achieve this would be to produce an updated scenario based on the *'Strong Electrification'* sensitivity from the 2021 ISP in line with 1.5C. This is more likely to be useful for jurisdictions like Victoria that are beginning to implement strategies for electrification such as the Gas Substitution Roadmap.

If AEMO proceeds with modelling scenarios where temperatures rise beyond 1.5C, it will need to model the significant physical risks to energy infrastructure associated with this level of global heating to ensure the full economic cost of these scenarios are covered.

**Recommendations:**

Model 1.5C across all scenarios.

Model a 1.5C scenario based on an update to the Strong Electrification sensitivity.

Include climate risks to energy infrastructure as an input in any scenario that is not compliant with 1.5C.

## Inadequate representation of announced and legislated government policies

There are a number of key policies which will have a real world impact on the transition that are not modelled in the draft IASR. This is a significant gap that must be addressed if the next ISP is going to be a useful strategic document for governments, industry and the wider community.

These include:

- Victoria's most recently announced economy-wide emissions reduction targets of 75% to 80% (on 2005 levels) by 2035, to be modelled across all scenarios.
- Updated Victorian Renewable Energy Target of 95% by 2035.
- Rolling Offshore Wind Targets of 2 GW of capacity by 2032, 4 GW by 2035 and 9 GW by 2040.

Under the Victorian Climate Change Act 2017, the Victorian government is legally required to deliver five yearly interim emissions reduction targets, to keep Victoria on track to meet its

long-term target of net-zero emissions by 2040. It is also legally required to develop a Climate Change strategy every five years setting out how these targets will be achieved across all economic sectors, consisting of key policy instruments such as the state's renewable energy targets.

The absence of state emissions targets and renewable energy targets that are directly linked to Victoria's legal requirements to act on climate change is a major gap in the IASR and a limit to the practical utility of the ISP.

A number of these policies will have a significant impact on transmission planning. For example, building 9 GW of offshore wind by 2040 will require significant investment in transmission in the Gippsland Renewable Energy Zone, including the need for redundancies.

AEMO considered the role of offshore wind by including candidate offshore wind zones in the 2022 ISP such as Gippsland, the Hunter and the Illawarra. The Gippsland Offshore Wind Zone was formally declared in December 2022, and candidate zones in the Hunter and Illawarra are likely to proceed to formal declaration in 2023. This process is supported by Commonwealth legislation the Offshore Electricity Infrastructure Act 2021. Modelling of offshore wind zones will also need to include different technology costs, particularly the difference between floating offshore wind and fixed-bottom technologies.

AEMO can strengthen the 2023 draft IASR and ensure the next ISP accurately reflects contemporary climate and energy laws and policy by including these key pieces of legislation and policy levers as inputs in all scenarios.

**Recommendations:**

Include the following policies as inputs across all scenarios:

- Victoria's most recently announced economy-wide emissions reduction targets of 75% to 80% (on 2005 levels) by 2035, to be modelled across all scenarios.
- Updated Victorian Renewable Energy Target of 95% by 2035.
- Victoria's Rolling Offshore Wind Targets of 2 GW of capacity by 2032, 4 GW by 2035 and 9 GW by 2040.
- Formal declaration of the Gippsland Offshore Wind Zone, December 2021.
- Commonwealth Offshore Electricity Infrastructure Act 2021.
- Candidate offshore wind zones in NSW at the Hunter and Illawarra.

## Significant Risk: Hydrogen Assumptions

The current hydrogen assumptions in the draft 2023 IASR represent significant risks that need to be addressed. The most concerning aspect is including the blending of hydrogen in the gas network in all the scenarios. In the '*1.5°C Green Energy Exports'* hydrogen blending this is considered limitless, while in other scenarios there is up to 10% hydrogen blending in gas networks.

Blending hydrogen in gas networks presents unique and unacceptable safety risks that will significantly increase costs, including[1]:

- Increased risk of gas network corrosion due to the diffusion of hydrogen through metal surfaces that can cause cracks and embrittlement
- Increased risk of leakage due to the smaller molecular size of hydrogen compared to gas, producing inefficiencies as well as global warming potential.
- Increased risk of ignition in gas network infrastructure including in the home[2].

Addressing these issues will require the wholesale retrofit of gas networks in order to prevent unacceptable safety risks. For this reason we believe hydrogen blending should not be included in the IASR. If AEMO proceeds with modelling this hydrogen blending it will need to include the very high cost of retrofitting the gas network, which is likely to make it uneconomic..

There is a role for hydrogen in the energy economy as an alternative feedstock in chemical production, high heat industry and some parts of the transport sector.

To reduce inefficiencies and leakage, hydrogen production will need to be concentrated on-site in industrial areas for these specific uses.

For all other uses, electrification of homes and businesses is a much more cost effective and efficient solution and should be prioritised in AEMO's scenario modelling.

Recommendations:

- Remove assumptions that hydrogen blending occurs in all scenarios.
- If AEMO proceeds, any modelling of hydrogen blending must include the cost of assessing and retrofitting gas networks to prevent unacceptable safety risks.

[1] 'Can Your Natural Gas Pipelines Handle Hydrogen Blends? Identifying and managing risk for hydrogen blending in natural gas pipelines', Exponent, May 26 2022 www.exponent.com/knowledge/thought-leadership/2022/05/can-natural-gas-pipelines-handle-hydrogen-blends

[2] Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues, US National Renewable Energy Laboratory, 2010.