

Date: 13 Aug 2024

Submission to 2025 IASR Scenarios

Thank you for the opportunity to contribute to the consultation on ISP scenarios. Rondo Energy is a supplier of electric thermal energy storage (ETES, or “heat batteries”), for industrial heat decarbonisation.

Since the 2023 IASR publication, what changes (such as environment, social, policy) do you consider most impact scenario development for the 2025 IASR scenarios?

The initiation of the Safeguard Mechanism should theoretically provide a stronger link between energy and carbon markets and incentivise more rapid electrification of industrial heat and transport. The impacts of this legislation are not yet clear, and it appears that most large emitters are waiting to see how things progress before making commitments.

Is AEMO’s proposal as described above a suitable evolution of each scenario’s parameters that will effectively support AEMO’s functions in planning the transition?

Yes, the changes in red are a sensible update to the scenario parameters.

What additional changes should be considered?

With regards to the *Plausible* principle, the hydrogen assumptions remain implausible in the Step Change and Green Energy Export scenarios. Australia’s ambitions to export hydrogen have not been met with either demand (willingness to pay) from international partners, or adequate funding to support the fantasy. \$6b of federal funding for hydrogen can support at most one modest export facility and would return no dividends to the Australian economy that could justify further subsidisation of a loss making industry.

Hydrogen on a ship cannot ever be competitive with other forms of energy; the capital costs and inefficiencies are inescapable.



Parameter	Progressive Change	Step Change	Green Energy Exports
Hydrogen use and availability	Low production for domestic use, with no export hydrogen 	Moderate-low production for domestic use, with minimal export hydrogen 	Faster cost reduction. High production for domestic industries, with high/moderate exports in the short term, and high exports in the longer term

Table 1 - Hydrogen Use Plausibility

Domestic hydrogen use is more plausible, but its potential is massively overstated. Hydrogen for industrial heat is not and cannot be competitive with other forms of heat due to it having the highest capital cost and highest operating cost. These characteristics will not magically improve for hydrogen and not for competing technologies.

Domestic hydrogen use for chemical conversion is the most plausible end use of hydrogen. However, no efforts have yet been made to evaluate Australia’s competitive position relative to other regions, or to test the equilibrium between flexible, price sensitive demand and non-discretionary demand.

Australia has significant advantages in the scale of high quality renewable energy resources relative to domestic demand. However, this does not necessarily translate into the lowest cost electricity. We suffer from high labour costs, high cost of capital compared to other developed nations, and worsening planning rules. Investors would rather deploy in nations with tax concessions, meaningful emissions legislation, and less onerous planning restrictions.

Hydrogen for ammonia production or mineral processing will require very low prices, below the LCOE of renewables. This is possible in a mutually beneficial equilibrium with non-discretionary demand.

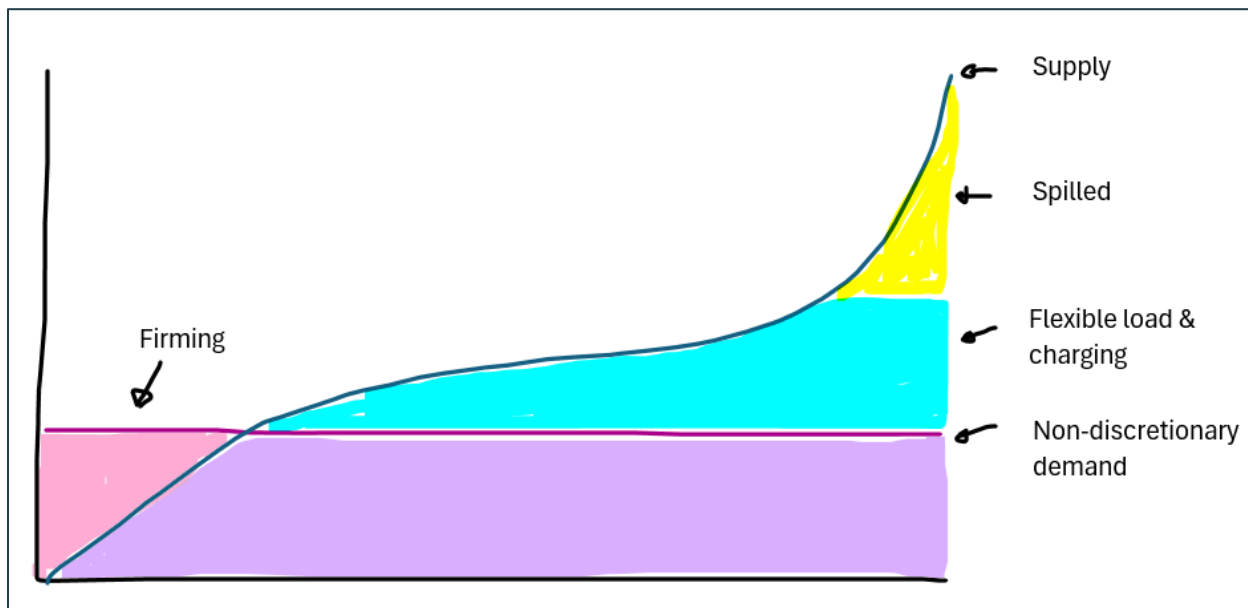


Figure 1 - Illustrative Renewable Supply Distribution

Without flexible load, non-discretionary demand must pay for the cost of renewable energy and firming. The payment for some portion of the renewable energy by flexible load reduces the amount of firming due to higher overbuild, and the proportion paid by non-discretionary demand.

As the ratio of flexible load grows, the price it pays must converge towards renewable LCOE, which is not economically viable. Some equilibrium exists where prices are too high for additional flexible load to deploy, and too low for additional renewables to deploy.

This level of equilibrium poses a problem for export oriented hydrogen derivatives as they cannot afford prices that thermal energy storage for industrial heat, or electric vehicles can. These substantial sources of flexible load could theoretically exhaust excess generation volumes before a hydrogen export industry becomes viable.

Why is this important?

The inclusion of high electricity consumption from hydrogen and its derivatives creates the impression that the transition will be ludicrously expensive and impossible to achieve. The potential revenues from export industries are not recognised in the discussion of scenarios so onlookers can only see the costs of additional generation infrastructure.

The hydrogen demand parameters are seen as a forecast even though AEMO explicitly says that they are not. This perpetuates the infatuation with hydrogen that governments and industry have. Our human and financial resources could be better directed elsewhere.

I understand it is out of scope for AEMO to model global hydrogen demand potential and Australia’s relative competitiveness. I would like to propose simple changes to the scenarios with regards to hydrogen to make them more plausible.

	Scenario: Progressive Step Change Green Export		
Existing hydrogen demand (oil refining, ammonia)	Low	Moderate	High
Domestic industrial hydrogen demand for heat	None	None	None
Domestic commercial hydrogen demand for heat	None	None	None
Domestic residential hydrogen demand for heat	None	None	None
Domestic hydrogen demand for transport	None	None	None
New domestic demand (e.g. SAF)	Low	Moderate	High
New export demand for mineral processing	None	Low	Moderate
New export demand for chemical feedstocks	None	Low	Moderate
New export demand for H2	None	None	None

Table 2 - Hydrogen Demand Sector Suggestions

These suggestions still maintain differentiation between scenarios (*Distinctive, Broad*), but are much more realistic in scale.



Flexible Load – Industrial Heat

With respect to industrial heat – we reiterate that the view that electric thermal energy storage should be included in the ISP as a major electrification pathway.

Please feel free to contact Rondo for further information.

Sincerely,

A handwritten signature in black ink, appearing to read "TG", is positioned above a solid horizontal line that serves as a signature line.

Tom Geiser
Head of Australia, Rondo Energy