The Superpower Institute

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National Electricity Market wholesale market settings review

Submission in response to initial consultation package

February 2025

About The Superpower Institute

The Superpower Institute's (TSI's) mission is to help Australia seize the extraordinary economic opportunities of the post-carbon world.

A net zero Australian economy will reduce global emissions by just over 1 per cent. But if Australia successfully seizes the economic advantage in exporting zero emissions goods, this can create an opportunity for full employment with rising incomes for a growing population sustained over more than a generation, and reduce global emissions by up to 10 per cent.

Renowned economist Ross Garnaut and economic public policy expert Rod Sims have joined forces through The Superpower Institute, to focus on practical research and policy to unlock this opportunity. The Institute specialises in the policy settings and market incentives needed to make Australia an economic superpower and provides practical knowledge to governments and industry to realise this opportunity.

TSI works across the building blocks of the superpower economy including: renewable energy, green hydrogen, land carbon and minerals processing; the potential zero carbon export products including green iron and green aluminium; and the enablers of this economy including economic and fiscal policy, trade policy and regional development.

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About this submission

Please contact TSI with any queries info@superpowerinstitute.com.au.

Introduction

TSI welcomes the review by the independent expert panel. This is a pivotal time in the evolution of the National Electricity Market (NEM) and decisions about wholesale market design will have lasting effects, not only on the energy market but also on Australia's entire economy and prosperity for decades to come.

The terms of reference for the review describe a focus on 'market settings in the National Electricity Market to follow the Capacity Investment Scheme.' While this focus is appropriate, many related issues of market design are also critical to consider.

The expert panel identified five topics for focus as part of the initial consultation:

- Topic 1: Investment incentives
- Topic 2: Consumer interaction with the wholesale market
- Topic 3: Changing nature of spot electricity prices
- Topic 4: Essential System Services
- Topic 5: Enhancing competition

TSI's submission focuses on topics 1, 3 and 5 in particular, although our comments have relevance across all topics.

There is also important broader context that has significant bearing on Australia's electricity system and markets, including:

- The global context in which other countries are committing to and taking action towards decarbonisation.
- Future industrial and trade trends, opportunities and threats for Australia.
- Australia's comparative advantage in energy production and energy-intensive industries.

Work by TSI, *The New Energy Trade*, has demonstrated that Australia can play a major role in global decarbonisation by leveraging its comparative advantage in renewable energy capacity and endowment of natural resources and minerals.[1] By supplying green metals, fertilisers and fuels to the world, Australia can contribute to a reduction of up to 10% of global emissions. This will require the capacity to produce renewable energy many times larger than current demand. It is an enormous task but one that would have proportionate payoffs for Australia's long term prosperity in a zero carbon world.

[1] The Superpower Institute, *The New Energy Trade*, November 2024

Standing in the way of realising this opportunity is a significant market failure: the lack of an effective system of global prices on carbon emissions. Green production technologies will be unable to compete with fossil-fuel powered equivalents while the latter do not pay for the damage they cause.

While the terms of reference of this review direct the expert panel to not consider options for *implementation* of carbon pricing, our view is that the panel should consider, and make recommendations on, how Australia can chart a course towards a comprehensive, economy-wide carbon price, compatible with international equivalents.

It is also important to recognise the strengths of the existing features of the NEM and to preserve and strengthen these, while adding complementary policies and measures capable of dealing with the challenges ahead.

TSI looks forward to making further contributions to future consultation as part of the review throughout 2025.

Topic 1: Investment incentives

The review's initial consultation observes:

> The existing 'energy-only' spot market is very efficient at delivering pricing signals for real-time operation. However, it was never intended on its own to be a pricing signal for investment in long-lived firmed renewable generation and storage. It is the interaction of this market with forward derivatives and policies such as the RET, state-based schemes and the CIS that have delivered longer-term pricing signals that allow projects to be banked. This Review will consider options for how to promote investment in firmed, renewable generation and storage capacity beyond the CIS.

TSI agrees with this summary and with the importance of the review recommending options beyond the CIS. We note that the market signals provided by the wholesale market provide guidance on future prices through the development of futures and other derivatives, as has occurred in the NEM over the past several decades. Additional interventions are required to correct market failures, for example those deriving from the external costs imposed by power generation from fossil fuels.

Investment decisions are essentially driven by risk and predictability of returns. Factors that influence this in the NEM can include:

- Variability in spot market prices, both intra-day and longer term
- The effectiveness of hedging against risk through derivative instruments
- Government regulation, policy settings and incentives
- Risks to stability such as uncertainty over any of the above factors

Policy settings should promote efficient investment decisions in the NEM by recommending policies and settings that have regard to the above factors.

TSI identifies two main issues for the panel to examine closely: how to promote the efficient investment in:

1. Sufficient amounts of energy production capacity to meet the demands of Australia's economy, and a future economy that will likely demand far more electricity than it does today. This includes demand during unusual and infrequent periods of limited variable renewable energy (VRE) availability.
2. Zero carbon energy and storage, which should be favoured over fossil-based energy sources in order to meet Australia's emissions reduction targets, potentially with a small role for 'peaking' technologies such as natural gas and hydrogen.

The energy-only market is a critical feature of the NEM that remains important, even as the market evolves to feature more VRE and consumer energy resources (CER). The

energy-only market promotes real time dispatch of the lowest cost electricity resources available to the market. This provides the right fundamental incentives for investments in capacity that is capable of producing at lowest cost.

High variability in prices is not necessarily a negative feature of the market and can play an important role. High variability of prices over time is a feature of many markets for goods in which capital costs represent a high proportion of total costs–for example, much oil and iron ore production. Over time, expectations of oversupply and low prices inhibit investment and future output; and expectations of undersupply and high prices encourage investment in new capacity. Stability in the market rules will encourage such developments in the energy market. In the electricity market, adjustment will be accelerated by the capacity of storage and flexible demand to increase absorption of product when prices are low, and augment supply when prices are high.

Confidence in long-term stability of market design is an important condition of efficient operation of the market–a condition that has been absent in Australia in recent times.

This leaves a question of what other measures, instruments and incentives should be adopted to complement the energy-only market in a way that meets the objectives of the NEM.

The Capacity Investment Scheme (CIS) is currently the main government instrument by which we seek to ensure sufficient levels of energy production capacity and storage are available to meet demand into the future.

If the CIS is effective over the period to 2027 it will see large amounts of VRE and storage built, contributing significantly to Australia's demand for energy by that time and our progress towards emissions reduction in the sector.

However, there are a number of significant shortcomings of the CIS:

- It requires large amounts of government discretion and resources directed to decisions regarding which projects receive support. Economic theory and practical experience generally tells us that government foresight on such matters will be inferior to investment being led by market signals.
- It crowds-out or has a cooling effect on investments outside of the program. This could mean that a sub-optimal level of investment in generation and storage capacity will be built if the government misjudges the amount that should be underwritten through the CIS.
- It may not deliver sufficient amounts of capacity that can be available during unusual and infrequent periods of limited VRE availability.

TSI recommends the panel examine options for investment incentive mechanisms beyond 2027 that: require less government discretion, favour a defined set of criteria for qualification and lean on market signals to guide investment decisions. Certificate schemes tend to have these features and the Renewable Energy Target (RET) scheme was an example of this.

We also highlight, under the heading of Topic 5, a recommendation made by the ACCC in its 2017-18 Inquiry which aims to encourage investment in supply from new sources.

Ultimately, the most efficient signal to guide investment in sufficient amounts of zero carbon energy and storage would be carbon pricing at the social cost of carbon emissions. This is a well-understood, conventional economic tool to deal with the negative externality of carbon emissions. With a carbon price in place, clean energy production would become a relatively more attractive investment proposition compared with polluting sources.

While the terms of reference rule out the expert panel considering **implementation** of carbon pricing, the panel can, and should, consider a pathway towards carbon pricing as an ultimate policy destination. Indeed, it is essential that any post-2027 mechanism to replace the CIS is capable of a smooth transition to carbon pricing by say, 2030.

Finally, there will likely be a need to separately address the need to have sufficient capacity available in unusual and infrequent periods of VRE unavailability. As these periods are highly unpredictable but potentially high impact a separate instrument to those described above may be necessary.

TSI does not favour a capacity market, such as those that are used in other jurisdictions. These tend to impose high costs on energy users and are not well suited to the kinds of unpredictable and infrequent shortfalls in supply we are seeking to deal with.

It is likely to be challenging to provide incentives for capacity to be built which will earn a commercial return when it will be called upon so infrequently and unpredictably. The panel should consider alternative models to meet demand in such circumstances such as:

- Government 'purchasing' mothballed or retired capacity for use only in strictly and clearly defined circumstances
- Limited direct government investment in capacity that will be drawn upon only in clearly defined circumstances.

TSI would welcome the opportunity to provide further input on the possible design of such mechanisms as the expert panel's review progresses.

Topic 3: Changing nature of spot electricity prices

The expert panel's initial consultation paper observes:

> During the transition to a highly renewable system, energy-only spot prices have become more volatile, including many periods where electricity is negatively priced and a higher number of extreme price periods. These provide acute signals for generators and consumers to be flexible in supply and consumption as well as for investment in storage. However, it may also make the insurance products to manage price risk more expensive.
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> Despite representing a small fraction of overall TWh of generation, gas prices drive a significant proportion of average wholesale electricity price outcomes. This trend is also observed across many other overseas markets. Given East Coast gas prices are heavily influenced by Asian gas prices, wholesale prices in the NEM have been and remain influenced by international events.

And the panel asks: How will prices at different times of the day and year change and evolve with the move towards firmed, renewable energy generation and storage?

TSI makes two observations.

Firstly, the dominant feature of the market in recent times whereby during daytime sunshine hours, when abundant solar PV energy is available, electricity is negatively priced, is an efficient market signal in two respects:

1. It sends a signal to the market that more investment in generation of this type is not valued by the market and will not earn a commercial return from spot prices (setting aside other payments outside of the spot market).
2. It sends a positive signal to the market about the opportunity for investment in technology (i.e. batteries) that can take advantage of negative daytime prices through energy storage, for use at other times when prices are high.

The 'arbitrage' opportunity for battery storage participating in the NEM is unlikely to be an ever-present feature. We should expect that as battery capacity increases in the NEM this will 'soak up' much of the negative pricing during the middle of the day and there will be more competition for the availability of this energy during the evening hours and therefore lower prices. It is uncertain how long this transition will take and therefore how long negative prices will persist as a feature in the market; the point is that there will be market-led pressure to reduce the opportunity over time.

Secondly, TSI sees an opportunity in future with the development of energy-intensive superpower industries (e.g. green iron, aluminium, fertilisers and fuels) to produce an energy system so large that the variability in pricing we see now will be overwhelmed

by the capacity to supply energy into the grid from a diversity of very large sources of supply. This can be viewed as a new form of very large and influential source of demand-side participation in the market. Where these industries are capable of ramping production up and down in response to energy price signals the sources of generation will be able to be diverted to supply the market in response to high prices.

TSI is undertaking work on this concept during 2025 which we will welcome the opportunity to share with the panel.

Topic 5: Enhancing competition

TSI agrees that enhancing competition is an important focus of this review.

We note that previous work on this topic, including the Australian Competition and Consumer Commission's (ACCC) 2017-18 inquiry, had a heavy focus on ways to enhance competition in the NEM.

The ACCC made a number of findings and recommendations regarding wholesale generation markets, including the following mechanism to enhance competition:

> The Australian Government should operate a program under which it will enter into low fixed-price (for example, $45–$50/MWh) energy offtake agreements for the later years (say 6–15) of appropriate new generation projects which meet certain criteria. In doing so, project developers will be able to secure debt finance for projects where they do not have sufficient offtake commitments from C&I customers for later years of projects. This will encourage new entry, promote competition and enable commercial and industrial customers to access low-cost new generation.

Under the ACCC's recommendation the support mechanism would have been available only to new entrants and those with only small market shares.

In the years following the ACCC's review the federal government implemented a policy known as the Underwriting New Generation Investments (UNGI) program. It was established to '....support firm generation capacity and increase competition as part of the Australian Government's commitment to lowering electricity prices and increasing reliability in the system.'

The government announced 12 projects to receive support under UNGI and held negotiations with the shortlisted parties. However the program closed on 25 October 2022 without having allocated any funding to any projects.

TSI notes that UNGI was not a faithful embodiment of the original ACCC recommendation. It suffered from the flaws identified earlier in this submission in that it relied on government discretion in picking successful projects rather than pre-determined criteria that automatically qualified project proponents.

TSI recommends that the expert panel re-examine the merit of the ACCC's original recommendation in the current market environment.

Further Information

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