



SCOPE OF WORK AND FORWARD PROJECT PLAN

DESIGN OF A CAPACITY MECHANISM FOR THE NATIONAL ELECTRICITY MARKET

The Energy Security Board's (ESB's) Post-2025 Market Design Review final advice (post-2025 final advice)¹ recommended a mechanism that explicitly values capacity in the national electricity market (NEM).

Energy Ministers have asked the ESB to progress detailed design work on a capacity mechanism that could be in place by 2025 or earlier. Energy Ministers provided a set of principles that state that the objective of this work is to develop the design of a market mechanism that ensures investment in an efficient mix of variable and firm capacity that meets reliability at the lowest cost. Advice on the final design of the capacity mechanism is due to Energy Ministers by December 2022. The design process should include engagement from Commonwealth Government, state and territory officials, stakeholders, and consumer representatives.

Energy Ministers also asked the ESB to work on orderly exit management arrangements for ageing thermal generators. These arrangements are to be complementary to, or part of, a capacity mechanism. This includes arrangements for jurisdictions to recover appropriate electricity-related costs from consumers and relevant information disclosure arrangements. This advice is to be delivered in March 2022.

1. Context

The NEM is rapidly transitioning to a lower-emissions generation profile, characterised by higher levels of near-zero marginal cost variable renewable generation. The draft 2022 Integrated System Plan (ISP) step change (central) scenario forecasts a transformation in the NEM, consisting of a significant investment in renewable generation, storage, and firming generation, with coal plant exiting by 2043. The modelling anticipates a near doubling of electricity consumed from the grid as transport, heating, cooking and industrial processes are electrified; construction of nine times the NEM's current utility-scale wind and solar generation capacity; and treble the firming capacity that can respond to a dispatch signal.

At the same time, jurisdictional schemes are introducing additional uncertainty. While these schemes can support new investment, their policy priorities are often broader and are often regionally focussed, which has implications for an interconnected market such as the NEM. These schemes can risk dampening spot and wholesale contract market prices which may have unintended consequences such as the early closure of existing large-scale generation. This, in turn, may drive further government intervention to keep ageing thermal plant open for longer. These interventions may not always be transparent and may create further uncertainties in the commercial investment environment.

Given the uncertainty the transition creates, jurisdictions are concerned around longer-term reliability risks, particularly where there is a perceived lack of confidence that the risks are being managed through the existing market design. However, jurisdictions' willingness to accept reliability risk or the very high scarcity pricing necessary for investment seems to be significantly lower than that of the private sector, with governments increasingly investing to manage risk on behalf of

¹ ESB, Post 2025 Market Design Final Advice to Energy Ministers, Parts A, B and C, July 2021. Available [here](#).



customers. Governments also have a lower risk appetite for interruptions in customer supply than commercial participants do, given that they are typically held politically responsible for the inconvenience caused. In the commercial environment, investors face a number of risks including the falling cost of new technologies, uncertainty around generator closure dates, demand uncertainty and a lack of counterparties to underwrite long-term investments

To close the gap between investor incentives and the risk appetite of governments, market arrangements that explicitly value capacity are needed. These will support existing plant where efficient, and otherwise encourage the building of new plant required over the coming decades to deliver the least cost transition. The current arrangements see electricity generators paid for the energy they produce but not necessarily for their capacity during at risk periods. Explicitly valuing capacity can complement existing spot and contract market revenue streams, and in doing so, should provide an investable and enduring long-term signal.

The NEM relies on spot price volatility and financial contracting to drive new investment. The high market price cap provides an incentive on retailers to contract away financial risk to generators (and demand side options), which places an incentive on generators to be available under scarcity. This theoretically provides the necessary return on investment for existing and new supply. However, the increasingly high penetration of variable renewable energy (VRE) with low marginal cost may impact the economics of dispatchable plant, particularly inflexible coal plant, during periods of high VRE output.

A future NEM needs to consider how to specifically value capacity or reward generation availability or demand-side participation when reliability is potentially at risk. This mechanism - a capacity mechanism – provides the opportunity for consistent market-based signals across the NEM jurisdictions to support efficient existing resources and drives new investment in technologies that can deliver firm and flexible resources as thermal generators exit the system at the end of their useful life. In this way, investments in capacity are funded through spot price revenue, supplemented by the value of their capacity delivered through the capacity mechanism.

The design of the capacity mechanism also needs to be considered in the context of:

- a variety of other resource adequacy reforms agreed to by the National Cabinet as part of its decision on the ESB's post-2025 final advice.²
- the Reliability Panel's review of the reliability standard and settings, which the Panel is required to complete during 2022, while the capacity mechanism design process is underway.

2. Objective and scope of the capacity mechanism design process

The ESB considers that the objective put forward by Ministers for this design process³ can be further broken down into two limbs to capture the aim of a capacity mechanism:

1. Ensuring investment in an efficient mix of variable and firm capacity that meets reliability at the lowest cost by:
 - facilitating the timely entry of new generation, storage and flexible resources
 - facilitating or complementing the orderly retirement of ageing thermal generation

² Further information on the final package of reforms for the Post-2025 NEM, as endorsed by National Cabinet, including the design principles can be found [here](#).

³ The objective of this work is to develop the design for a market mechanism that ensures investment in an efficient mix of variable and firm capacity that meets reliability at lowest cost. Further information can be found [here](#).

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- complementing other market arrangements addressing resource adequacy.
 - 2. Increasing government and community confidence that the market will deliver resource adequacy and thereby reducing the need for interventions over the longer term

This objective means that a capacity mechanism for the NEM would:

- Provide adequate investment certainty to facilitate the transition to a net-zero emission market. Specifically, to:
 - drive investment in new resources, including in demand response
 - incentivise existing plants to stay if they are needed, up to the end of their useful lives
 - allow all resources on both the supply and demand sides to be adequately rewarded for the reliability services they provide.
- Support the business case for new required technologies, such as long-duration storage and demand-side participation.
- Increase transparency about what capacity is available during anticipated reliability shortfalls.
- Integrate current government investment schemes and provide a role for government investment to work alongside the mechanism.

3. Scope of work

A new mechanism to explicitly value capacity to increase investment confidence is a significant change to the NEM. While there are international examples of various capacity mechanisms, a fit-for-purpose capacity mechanism must reflect power system conditions unique to the NEM and the characteristics and capabilities of its existing assets, as well as drive efficiencies that help transition the NEM towards a net zero emissions future at least cost.

In any capacity mechanism there are several key design choices. Various options for a capacity mechanism share many of the same building blocks and design drivers. There are two design choices that lead to very different options for a ‘physical’ capacity mechanism:

- Who forecasts and determines the amount of capacity that will be required?
- Who is responsible for the procurement of capacity?

Further background on design choices for any capacity mechanism are outlined further in sections 4 and 5 of the project initiation paper.

For the ESB to deliver an efficient and effective detailed design for a capacity mechanism by December 2022, the options for a mechanism need to be considered at the beginning of the process. Doing so will allow a preferred option to be agreed early in the process and progressed to a detailed design phase.

3.1. Approach to the design work

The ESB acknowledges stakeholder feedback on the need for a capacity mechanism. We accept that there is a continued need to demonstrate why new market arrangements that explicitly value capacity, separately from the energy price, are needed to support investment for a future net zero emissions NEM. This will form part of the design process.

3.1.1. *High-level design options*

In the initial phase of the process, the ESB will consult with stakeholders on two ‘physical’ options for a capacity mechanism:



1. A decentralised mechanism where retailers are incentivised to procure capacity, which in turn drives investment in the required resources.
2. A centralised mechanism where a central body determines the capacity requirement and has responsibility for procuring the necessary resources to meet the reliability requirements.

The ESB's focus for this phase will be on a capacity mechanism best suited to the NEM's future needs.

Capacity mechanisms are common in other parts of the world and often operate alongside wholesale energy markets. The ESB will consider the best aspects of different designs whilst also considering how these would be able to be incorporated into the very specific requirements of the Australian market.

The aim will be to develop high level designs for both physical options in sufficient detail to allow selection of a preferred mechanism to be developed in detail for recommendation to Ministers in December 2022.

3.1.2. Detailed design and evaluating the benefits of a capacity mechanism

Once a preferred mechanism has been identified, subsequent work will focus on developing the preferred mechanism to detailed design. Consultation with stakeholders and governments will occur throughout the design process prior to key decision points.

To evaluate the benefits and performance of the design of the preferred capacity mechanism, the ESB will develop and consult on a 'base case' that is, a plausible future for the NEM in a net zero emission future in the absence of a mechanism that explicitly values capacity.

3.2. Core design areas for any mechanism that explicitly values capacity

There are several complex decisions when developing a physical capacity mechanism. Both centralised and decentralised capacity mechanisms share many of the same building blocks and design drivers. The design of the capacity mechanism can be decomposed into the following elements:

- the definition of capacity
- transmission constraints and interconnection
- market power mitigation
- certificate trading and procurement
- forecasting methodology and the determination of capacity demand
- compliance, incentives and penalties.

Each of these elements will be addressed by a workstream. Resources will be shared across workstreams to account for interdependencies across elements.

The ESB is cognisant of the impacts associated with the significant shift in market design that comes with a new capacity mechanism. Minimising these impacts will be a key priority in the detailed design phase to safeguard competition in the retail and wholesale market and reduce adverse market impacts which will ultimately be borne by consumers. Impacts of any mechanism on small retailers and commercial and industrial (C&I) customers will require careful consideration. As will the ability of the capacity mechanism to incentivise the participation of demand response to allow for potential efficiency gains and ensuring that the right mix of resources is incentivised. Each of these will be considered in the choices of core design elements. The ESB has published an initiation paper with more information on these elements.



3.3. Design of the energy market

As part of the design process the ESB will also consider how the energy market will operate alongside any capacity mechanism, particularly the NEM's price settings.

3.3.1. *Reliability settings*

The Australian Energy Market Commission (AEMC) is considering a rule change request from Dr Kerry Schott AO that seeks to align the Reliability Panel's current reliability standards and settings review with this design process. The outcome of the rule, if made as proposed, will require the ESB to consider:

- the reliability (market) settings that would work alongside any recommended capacity mechanism to achieve the reliability standard
- what reliability (market) settings, if any, should be in place for the interim period before a capacity mechanism is implemented, considering the impact of the timing of any changes on the contract market, and the potential to place a freeze on the settings before the mechanism is implemented
- the reliability (market) settings that would achieve the reliability standard in the event a capacity mechanism is not agreed.

The ESB notes that stakeholder engagement on each of the above scenarios for the price settings will be critical. The ESB and Panel are working to determine the best way that the ESB can leverage the Panel's expertise and industry representation in the design process. The ESB and the Panel will be collaborating closely on these related processes

Milestones for deliverables for this market settings work and its interdependencies with the forward work plan (set out below) will be published when the rule change is further progressed.

3.3.2. *Enhanced Financial Retailer Reliability Obligation*

The post-2025 final advice considered various modifications to the current Retailer Reliability Obligation (RRO). However, the ESB did not recommend these modifications. The ESB noted that an alternative to creating a physical capacity mechanism was to alter the definition of qualifying contracts in the existing RRO in a way that would increase the likelihood of a physical linkage. Altering, or limiting, the nature of contracts considered 'qualifying contracts' for the current financial RRO could incentivise financial contracting with a stronger link to 'firm' physical resources.

The ESB is proposing to not consider enhancing the financial RRO to increase the likelihood of a 'physical linkage' as an option for detailed design. The energy-only market with the current financial RRO (including other proposed minor amendments) will be considered further as part of the base case against which the benefits of a proposed capacity mechanism will be considered.

4. **Assessing the capacity mechanism**

4.1.1. *Using the National Electricity Objective as a basis for evaluation*

The ESB is guided by the National Electricity Objective (NEO) in developing and assessing capacity mechanism design options. The NEO, as stated in the National Electricity Law (NEL), is:

"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- *price, quality, safety and reliability and security of supply of electricity*
- *the reliability, safety and security of the national electricity system."*



4.1.2. Approach to the design principles

Energy Ministers have also provided the ESB with principles to underpin the capacity mechanism design process (see appendix A). The ESB acknowledges that the design principles reflect concerns that Energy Ministers would like to see addressed in the development of the detailed design of a capacity mechanism. These will be a critical input for the agreement of any mechanism.

Some of the Energy Ministers' design principles are readily addressed in developing a capacity mechanism that is best suited to the NEM's future needs and will apply across the NEM. Other design principles will require careful investigation to ensure that the capacity mechanism satisfies them as best as possible while meeting the objective of ensuring investment in an efficient mix of variable and firm capacity that meets reliability at the lowest cost.

The assessment criteria in section 3.3 have been developed in line with Energy Ministers' design principles and provide a framework through which different design options will be assessed against the NEO.

4.1.3. Assessment criteria and design principles

The ESB is proposing the following assessment criteria:

1. Achieving the optimal level of reliability: a mechanism should achieve the level of reliability that consumers and governments value.
2. Appropriate allocation of risk: a mechanism should efficiently and appropriately allocate risks.
3. Technological neutrality: a mechanism should be technologically neutral while recognising the rapid pace of change, noting there are design principles which relate to these criteria that will be addressed during the process.
4. Minimise regulatory burden: a mechanism should minimise the regulatory burden for market participants.
5. Emissions reduction: a mechanism should be compatible with emissions reduction targets set out by state and federal governments.

Addressing the detailed design principles will form an integral part of the design process. To best facilitate the detailed design process, the ESB intends to consult on, and provide advice to Energy Ministers on, the implications of design principles for the detailed design process and the options for design to accommodate design principles as the process progresses. This staged approach will allow Energy Ministers to provide guidance on these principles at various points in the process and be able to consider the ESB's advice in the context of a developed mechanism.

5. Project timelines and stakeholder consultation

Effective stakeholder engagement will be critical to designing a capacity mechanism for the NEM. The ESB recognises stakeholder concerns over the significance of such a change to the market and will work with stakeholders and jurisdictions to develop the mechanism to put to Ministers in late 2022. The process has been designed to maximise stakeholder engagement within these timeframes. Working together and 'co designing' where possible, will be important.

The forward work program has been structured to allow the ESB to seek guidance from Energy Ministers on the progression of the design of the capacity mechanism at key stages in the design process. This will allow the ESB to seek stakeholder feedback in an informed way.

The ESB will establish an advisory panel and various technical working groups comprising diverse stakeholders with experience and expertise to inform the detailed design process.



The ESB will also carry out formal public stakeholder consultation, consisting of submissions on consultation documents, stakeholder briefings and public forums/webinars as appropriate.

A more detailed timeline of the various opportunities will be made available in early 2022.

5.1. Timing and deliverables

National Cabinet has requested that the ESB prepare a detailed design of a capacity mechanism for Energy Ministers to consider by December 2022. Table 1 below sets out the indicative forward work program. It includes meetings with Energy Ministers to seek guidance on the progression of the capacity mechanism. These meetings have been given indicative dates for planning purposes.

The key four phases for the process to December 2022 are as follows:

1. Develop a preferred approach of a decentralised or centralised mechanism. This will be based on stakeholder feedback to an initiation paper released in December 2021.⁴
2. Develop a detailed strawperson for the preferred option for consultation.
3. Prepare a draft detailed design for consultation.
4. Develop final design and recommendations for Energy Ministers.

⁴ Capacity mechanism – Project initiation paper found [here](#).



Table 1 forward work program – indicative key milestones

Milestone	Indicative timing
Project initiation paper	December 2021
(Indicative) Report to Ministers: <ul style="list-style-type: none"> high-level design for a preferred option for capacity mechanism advice on implications of design principles for the detailed design process advice on orderly exit management contract arrangements and interaction with the preferred capacity mechanism option 	March / April 2022
High-level design consultation paper on preferred option	April 2022
Public webinar on the consultation paper	April 2022
Submissions due on the consultation paper	Early May 2022
Ongoing stakeholder input – ESB working papers/workshops on various detailed elements of capacity mechanism design	April – July 2022
(Indicative) Report to Ministers: <ul style="list-style-type: none"> draft detailed design advice on options for design to accommodate design principles 	August 2022
Draft detailed design paper published	August 2022
Public webinar on the draft detailed design	August 2022
Submissions due on the draft detailed design	September 2022
Ongoing stakeholder input. ESB working papers/workshops on: <ul style="list-style-type: none"> elements of ‘re-design’ needed to address principles, where necessary further design of elements of the capacity mechanism Legislation and drafting underway for capacity mechanism as set out in the draft detailed design	August – November 2022
Submit final detailed design and proposed law and rule changes to Ministers	Early December 2022
Report to Ministers: <ul style="list-style-type: none"> Final design of the capacity mechanism for agreement 	December 2022



Appendix A – Energy Ministers’ Principles to guide capacity mechanism development

Energy Ministers have provided the following principles to guide the development of a capacity mechanism.

The objective of this work is to develop the design for a market mechanism that ensures investment in an efficient mix of variable and firm capacity that meets reliability at lowest cost.

Noting that:

- Jurisdictions can derogate from the National Electricity Rules if they wish, following the process set out under the National Electricity Law.
- The Australia’s Emissions Projections 2020 report anticipates emissions reductions in the NEM of approximately 50 per cent on 2005 levels by 2030, driven by increased levels of renewables and the closure of coal-fired generation, with further reductions expected beyond 2030.

The detailed design work on a capacity mechanism will be guided by the following principles agreed by Energy Ministers:

1. be consistent with the **National Electricity Objective**
2. focus on **affordability, reliability, security, and continued emissions reduction** of electricity supply
3. provide a **signal to value capacity** that best supports the needs of the NEM
4. **complement existing energy only market design** and well-functioning **markets for financial contracts**, and other reforms in development
5. **minimise regulatory burden** for market participants
6. **safeguard energy consumers**. In particular:
 - a. ensure costs and revenues are efficiently and fairly allocated; and
 - b. avoid duplication of costs to secure reliability.
7. ensure sharing of resources across the NEM by **supporting inter-regional contracting**
8. provide **greater certainty around closure dates** of exiting generation
9. **mitigate** reliability risks presented by **unexpected closures** of existing capacity
10. encourage the **timely replacement** of existing capacity through driving commitments to new investment within reasonable notice periods of closure of existing capacity
11. to the extent it does not conflict with state and territory policies, be **technology neutral** to ensure a focus on the ability of each resource to deliver generation on demand, for the periods when it is most needed
 - a. Jurisdictions must be able to determine, via their regulation, provided for in the National Electricity Law framework, which technologies are eligible for participation in a capacity mechanism in their region
12. recognise relevant **state and territory policies and investment schemes** to account for bespoke arrangements to retain and replace existing capacity
13. enable jurisdictions to opt out, via the National Electricity Law framework
14. enable jurisdictions to opt in, through triggered thresholds for the mechanism.