



POST 2025 MARKET DESIGN FOR THE NATIONAL ELECTRICITY MARKET (NEM)

The COAG Energy Council has tasked the Energy Security Board with developing advice on a long-term, fit-for-purpose market framework to support reliability that could apply from the mid-2020s. By the end of 2020, the ESB needs to recommend any changes to the existing market design or recommend an alternative market design to enable the provision of the full range of services to customers necessary to deliver a secure, reliable and lower emissions electricity system at least-cost. Any changes to the existing design or recommendation to adopt a new market design would need to satisfy the National Electricity Objective. A forward work plan for this project is set out at Appendix 1. This forward work plan was approved by the COAG Energy Council at its December 2018 meeting.

Any significant changes to the electricity market design would need to be well considered, including substantial input from stakeholders and detailed consideration of alternative market designs, and telegraphed well in advance of any change to ensure there is minimal disruption to the forward contract markets for electricity.

If changes are required to deliver a long-term, fit-for-purpose market framework by the mid-2020s, then consideration of any required changes should be concluded by the end of 2020 to enable sufficient time for the market to transition to the new market framework.

Scope of the project

Consideration of the optimal future market design is a far-reaching process that interacts with all steps of the electricity supply chain, from fuel sources to end users. It is taking place in the context of a market and regulatory framework that is already evolving to address emerging challenges such as changes in the make-up of the generation stock, and at a time when energy ranks very high on the political agenda.

Without a holistic assessment of the most efficient way to deliver the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers, we risk layering change upon change with the expectation this will enable these objectives to all be met.

It is not intended that this project review every aspect of the existing system from first principles, but the project will look at issues in depth where they are relevant to the energy transition under way. This may include key fuel markets, such as natural gas markets. The project team will work with energy market bodies as required to understand the longer-term implications of existing reform processes.

The integration of centralised and decentralised resources

Australia already has world-leading levels of rooftop solar PV and this in turn provides a large addressable market for small-scale storage. Small-scale storage may also emerge as commonplace over the next decade especially if there is a rapid uptake of Electric Vehicles. Accordingly, the market design needs to consider how such distributed energy resources (DER) can participate in the market, noting that it is only practical to incorporate them into the market if the market/system operator has visibility of their performance, which is not currently the case with much of the DER that has been installed behind customer meters. So, distribution and retail frameworks are relevant to the project along with bulk power supply and transmission. Further the project will need to explicitly consider how centralised and decentralised resources are integrated in order to achieve the optimal mix of each. This may be achieved by ensuring there are ways by which numerous decentralised resources can be efficiently aggregated to participate effectively in wholesale markets, or by developing localised markets for decentralised resources, or a combination of both. Energy efficiency and demand response will also be a critical element of any future market design.

Securing the supply of the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers

At the time of market start, virtually all energy in the NEM was provided by large synchronous generators. While they differed in levels of flexibility, they were essentially all dispatchable, and inherently capable of providing a range of ancillary services, such as frequency, inertia and system strength (in conjunction with the transmission network). Indeed, there was sufficient confidence in an adequate supply of these services that some of them had no specific procurement mechanism associated with them.

The future electricity system will be made up of a more diverse range of power sources, both large and small scale. It is plausible that the lowest cost sources of energy, especially on a short-run marginal cost basis, will be variable renewables using power electronics. Such resources are not inherently able to provide all the necessary ancillary services to maintain a secure power system (though with appropriate technology they can provide some services). Further, there are non-energy generating assets that can provide ancillary services, such as synchronous condensers. Accordingly, the project will need to consider ways to ensure an adequate supply of such services even in the eventuality that the assets that do so are not able to rely on energy revenue to underpin their financial viability, whilst maintaining the lowest possible system cost. Each service must be considered separately as well as looking at how they can be collectively co-optimised. This will also take place in the context that many customers will directly procure some/all of the services they need via DER.

In the case of services such as low emissions and potentially reliability, the optimal market design would be one that is able to deliver different levels of such services, according to policymakers' preference (or consumer preference mediated through policymakers' instructions).

All potential options for securing supply and cost recovery models will be considered

There are numerous ways in which a service can be secured, including but not limited to: mandatory service provision by those who can, regulated pricing, bilateral negotiation, competitive tender, facilitated market and a free market. So, although this project is framed as finding the best market design, it will also consider options that may include more centralised planning and decision making. The consequences for risk allocation will need to be carefully considered in evaluating these options, as will the implications for successful integration of centralised and decentralised resources where these are subject to different types of service provision. There are also many ways in which the costs of a service can be recovered. The choice of how to secure supply may dictate the cost recovery model – e.g. a market such as the NEM wholesale market. Some services may be procured globally on behalf of customers and there are important decisions to be made as to how best to share those costs across different consumers. In this regard user pays/causer pays methodologies can in principle serve as a signal to consumers (or their agents) to manage their behaviour to minimise the requirement for such services. This may not always be the case in practice, however.

The current context of government taking a more active role in the sector in various ways, including new investments, contracts for difference, grants and other instruments means that some public sector models that might not previously have warranted consideration are in scope. Additionally, the ongoing role of governments and how their actions may influence the success of different market designs will also need to be considered. Even though the role of governments will be under consideration, compulsory acquisition of privately-owned assets is not.

Ultimately, the preferred models will be predicated on understanding what is physically required to be delivered and what is the lowest cost for delivering those physical services.

The optimal market design will not only need to deliver lowest-cost power and other services on a day-to-day, minute-to-minute basis, but also be capable of sending appropriate signals for timely investment and disinvestment and give investors confidence in their ability to make a risk-adjusted return on investments. It does not follow that investors in new or existing resources should be guaranteed a return, although the trade-offs inherent in choices about where risk resides will need careful consideration. A further consideration is that an increasingly material proportion of investment is made by customers large and small, many of whom will make investment decisions using simplified heuristics. The project will need to investigate the various barriers to investment that have been cited, both those internal and external to the market design itself.

Exploring the interaction of the physical and financial markets will be important to understanding how investment is supported as will the dynamics of the Commercial & Industrial (C&I) customer market.

Complementary policies will need to be considered

The most effective market design may require other policies in order to work most effectively. This could potentially include gas market reforms, or changes to the way some network revenues are recovered. To the extent an alternative design is the project's final recommendation, the complementary policy requirements will also be included in the recommendations. There may also be negative recommendations, i.e. policies to be avoided because they will not fit well with the market design. Conversely, given that other policies may not be enacted as an integrated whole with the market design, there are risks in choosing a market design whose success is heavily dependent on particular complementary policies.

Scenarios will need to be developed

Market design options will be informed by reasonable expectations of the generation mix in 2025 and beyond, the extent of take-up of distributed resources, the ways consumers interact with the system, the configuration of the transmission network, external policy settings, future technology price paths, the potential development of a hydrogen industry, and the way these factors could all evolve over time (several of which of course will be influenced by market design options). Clearly there are various ways in which these factors can diverge from where we are today. Well-developed scenarios are also necessary for testing expected outcomes from the alternate market designs. This does not mean that the alternate market designs will or should be tailored to the scenarios, given that they represent only a handful of possible futures.

Various parties, including the energy market bodies have developed and are developing multiple scenarios to inform their own analysis. However, scenarios are always to some extent designed for the particular use to which they are being put, and so this project will need to develop its own set of scenarios to be an appropriate tool for analysis. In doing so, it will undoubtedly draw on other similar exercises for input.

The governance of the electricity system is not considered to be in the scope of this project. Should an alternative market design be recommended that required a review of governance arrangements, there is adequate time to carry out and implement the review before market start in 2025.

Stakeholder input will be critical

Effective stakeholder engagement will be critical to the success of the project. To this end, the project will be informed by an expert advisory panel and technical working group, each comprised of a diverse set of stakeholders with appropriate experience and expertise. Participation in these groups will be by invitation only.

Three rounds of public consultation will be held in 2019 (see Appendix 1 below for further details) and further public consultation is expected in 2020 with the timing and format to be dependent on the nature of the options under consideration.

The project team will also seek to engage directly and as broadly as possible with stakeholders throughout the course of the project.

Specialist advice on technical issues will be obtained where required, including international perspectives.

Project Governance

COAG Energy Council

COAG Energy Council, supported by the Standing Committee of Officials, will be the ultimate decision makers on any major design changes to Australia's electricity markets.

The Energy Security Board will be expected to report regularly to both COAG Energy Council and the Standing Committee of Officials on progress against the agreed forward work program.

Energy Security Board

The ESB will make recommendations to COAG Energy Council on the post-2025 Market Design. The ESB is the decision-making body on the shape of those recommendations. The ESB will guide the project and discuss and approve all documents prior to their public release or submission to COAG Energy Council or the Standing Committee of Officials.

Internal Working Group

An Internal Working Group will be the locus of working level interaction between the ESB project leads and each of the market bodies. The Internal Working Group will work as a project team to deliver all the materials for Board approval.

SCO Reference Group

The SCO Reference Group will be comprised of senior officials from each of the NEM jurisdictions and will provide the focal point for feedback from jurisdictions on the progress of the project.

The SCO Reference Group will be chaired by the Deputy Chair of the ESB.

Advisory Panel

The Advisory Panel will be comprised of senior stakeholder representatives covering a range of existing and potential electricity suppliers, technology developers, academics and users as well as government stakeholders.

Given the challenges of convening such a panel, it will need to be used judiciously to provide advice and to test options on significant issues such as: the range of services to be considered, the overall state of the current market design and the options to be presented for consideration.

The Advisory Panel will be chaired by the Deputy Chair of the ESB.

Technical Working Group

The Technical Working Group will be comprised of market and technical experts from a range of stakeholders, and will be used to tease out issues and answers to more detailed elements of the market designs, such as understanding why issues with the current market have manifested, how the markets for different services interact, where there may be technical barriers to particular solutions, and detailed questions around potential alternative designs.

The Technical Working Group will meet as required but would be expected to meet at least once prior to each document being finalised for ESB approval ahead of public consultation. The Technical Working Group will be chaired by the Project Director.

APPENDIX 1: FORWARD WORK PROGRAM – POST-2025 MARKET DESIGN

The timetable below is indicative.

- February 2019 – Establish Internal Working Group to provide technical input on work program and support project team.
- February-March 2019 – Develop detailed project plan including scope of work. Scope of work to explicitly consider the integration of centralised and decentralised resources and the areas of technical analysis that will be required. Scope of work should also consider how investment occurs and is rewarded throughout the electricity system and identify the most appropriate charging models. The scope of work should consider the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers including energy, capacity, flexibility, frequency, voltage, inertia, system strength, transmission and distribution services, and demand response (as a provider of multiple services).
- March-May 2019
 - Identify the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers.
 - Establish the objective measures to inform all stakeholders of how the existing market design is performing and the appropriate assessment framework for any alternative market designs. Determine how the post-2025 market design work program will integrate with existing work programs that are considering future changes to the existing market design.
 - Describe how (if) the existing market design delivers the full range of services required to deliver a secure, reliable and lower emissions electricity system and quantify the total system cost to customers.
 - Scenarios development.
 - First meetings of expert advisory group and technical working group to assist with above work. These groups will also meet 2-3 more times during 2019.
- June 2019 – Undertake broad stakeholder consultation on:
 - the full range of services required to deliver a secure, reliable and lower emissions electricity system at least cost to customers, and;
 - the performance of the existing market design.
- June-August 2019 – Identify options for the provision of the full range of services required to deliver a secure, reliable and lower emissions electricity system
- March-August 2019 – Assessment of different international options for electricity market design
- September 2019 – Stakeholder consultation on the options for the provision of the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers
- December 2019 – Identify two potential options for the provision of the full range of services required to deliver a secure, reliable and lower emissions electricity system at least cost to customers (in addition to the current market design).
- December 2019 – Undertake broad stakeholder consultation on two potential options for post-2025 market design.
- Q1 2020 – Establish key work streams to develop detailed design of each of the options.

- Q1–Q4 2020 – Detailed analysis of each of the options obtaining specialist advice where required. Undertake consultation on specific issues as required.
- Q4 2020 – Recommend changes to existing market design or alternative market design to enable the provision of the full range of services required to deliver a secure, reliable and lower emissions electricity system at least-cost to customers.
- 2021 – Develop, consult and agree any changes to the National Electricity Law and/or Rules required to implement the changes to the existing market design or alternative market design.
- 1 July 2022 – Finalise any changes to post-2025 Market Design.
- 2023 – Systems development for post-2025 Market Design (as required).
- 2024 – Live testing (parallel) of post-2025 Market Design (as required).
- 1 July 2025 – Post-2025 Market Design commences operation (as required).