



COAG
Energy Council

**ENERGY SECURITY BOARD
POST-2025 MARKET DESIGN
DIRECTIONS PAPER**

MARCH 2020

Post-2025 Market Design Project – Directions Paper

This paper provides an update on the Post-2025 market design project, it sets out the reform topics and directions the project is examining, how these directions relate to the urgent reliability and security measures agreed by COAG Energy Council (Energy Council), indicative project timelines and consultation and evaluation approaches.

Background

In March 2019, the Energy Council requested the Energy Security Board (ESB) to advise on a long-term, fit-for-purpose market framework to support reliability, modifying the National Electricity Market (NEM) as necessary to meet the needs of future diverse sources of non-dispatchable generation and flexible resources including demand side response, storage and distributed energy resource (DER) participation.

The Post-2025 program has been established to oversee and coordinate this program of work, bringing together multiple forward-looking reform initiatives to develop alternative market designs for recommendation to Energy Council. Considerable input has been received from a wide range of stakeholder interests, and has been valuable in shaping the focus and plan for the Post-2025 program.

In November 2019, the Energy Council met and requested the ESB deliver a number of additional items for analysis, seeking recommendations for consideration at its March 2020 meeting. These items included analysis on Renewable Energy Zones, system security measures, reliability framework and a recommendation regarding development of ahead markets and two-sided markets.

The recommendations emerging from these interim measures have seen significant development by the ESB and the market bodies within each of the respective workstreams. These recommendations have in turn been built into the strategic approach for the Post-2025 market design program, whereby a phased implementation for development and delivery has been developed, laying the foundations for market design reform from now to 2025.

In practice, this will involve three key phases of program development and delivery, as follows:

- **Short term (12-18 month) deliverables:** relating to the Renewable Energy Zones, and interim security measures and reliability framework measures,
- **Intermediate deliverables:** relating to development of Ahead Markets, Two-Sided Markets and Access Reform via CoGATI, to be developed for decision at the framework level by the end 2020 with implementation for some aspects likely ahead of 2025, and
- **Longer term deliverables:** relating to Investment programs, an aging thermal generator strategy and initiatives relating to development of DER markets with implementation after 2025.

Final recommendations on all aspects will be made no later than mid-2021, with development of legislation and rules packages to follow.

This strategic approach is intended to enable phased delivery to Energy Council of high priority reforms on a timetable reflecting the urgency of the challenge, while enabling a rigorous and consistent evaluation of initiatives with other related or interdependent initiatives to be progressed in parallel. Allowing a sensible timeframe for development in parallel over 2020, is intended to enable the design to draw on the rich diversity of inputs from stakeholders, building confidence and support that a considered, holistic and future focused approach is being taken with the development of future market design.

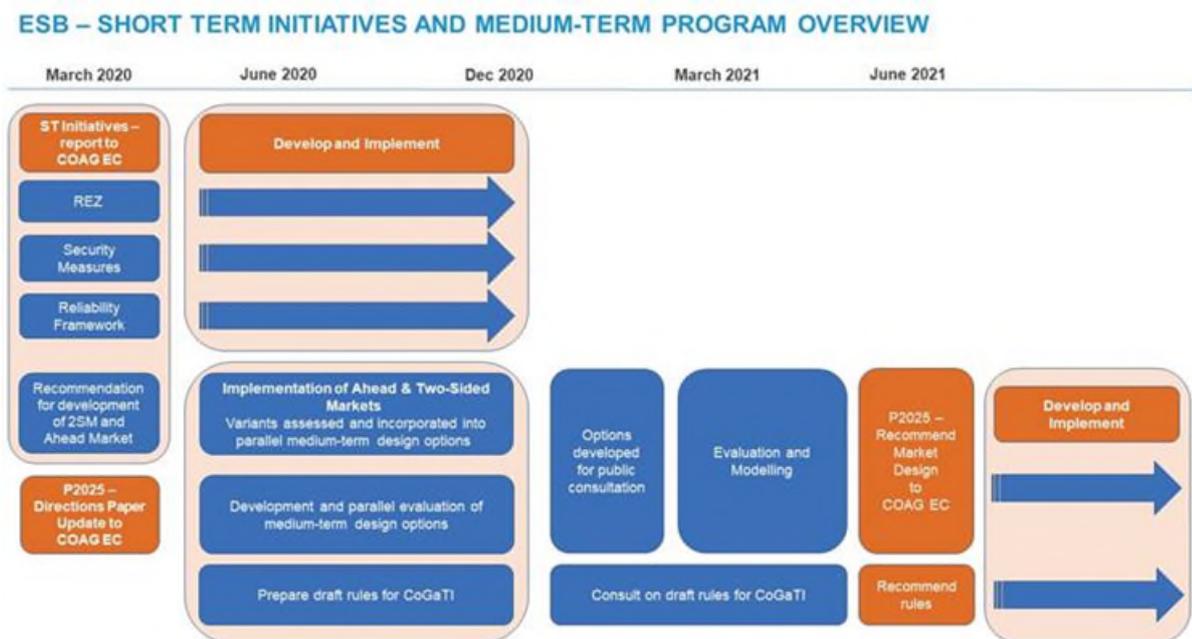
This paper is intended to provide an update on progress made to date and set out the structured approach and timing intended for assessing and implementing the proposals for future market reform.

Program Overview

An overview of the Post-2025 program structure is set out below in Figure One, including illustration of how recommendations from the interim reliability and security initiatives are being built into options for future market design.

Consistent with Energy Council requests, recommendations for aspects of market design will be delivered early in 2020 to enable development and implementation to progress over the short term. Development of broader initiatives will continue in parallel over 2020, enabling medium term design options to be delivered in conjunction with stakeholder input for 2025.

Figure One – Short Term Initiatives and Medium Term Post-2025 Program Overview



Market Design Initiatives

For the Post-2025 Program, there are seven core market design initiatives being progressed. Each of these initiatives will have significant implications for the operation of the existing NEM, with work progressing to assess each initiative from a technical and regulatory perspective. Multiple variants may emerge from within each framework level option, each of which will require careful consideration. An overview of each initiative is summarised in **Appendix A**.

A summary of these initiatives and organisational project lead for each are identified below:

A. Investment signals for reliability (Capacity Mechanisms) – AEMC + ESB

This workstream is evaluating the case for introduction of a mechanism to incentivise investment in resources, and the evaluation of the pros and cons of specific mechanisms.

B. Aging Thermal Generator Strategy – ESB

The focus of this work will be on the market arrangements and regulatory approaches to ensuring that sufficient replacement capacity and system services are available to replace large, aging thermal generators as they exit the NEM over the coming decades.

C. Essential System Services – AEMO + ESB

This work stream will build on the interim measures relating to system security and intermediate measures on ahead markets agreed at the March Energy Council meeting. The focus of this work will be to develop an enduring regulatory framework that will enable the market operator and participants to meet future system services needs. This framework will be applied to provide advice on:

- future system service requirements in the p2025 timeframe
- identify and define new system services that may be needed
- high level mechanisms to efficiently source system services.

D. Ahead Markets – AEMC + AEMO

The ESB considers that security constrained economic dispatch of energy-only is, by itself, no longer sufficient to maintain system security. The ESB considers that new system services need to be established and remunerated and an ahead market is required to ensure system security going forward.

The ESB will provide advice to COAG on a design for ahead market(s) and timing of implementation by the end of 2020.

An ahead mechanism for the NEM can take a range of forms. A range of options will be developed from smaller changes that strengthen the commitment mechanism for reliability and security, to more extensive changes that integrate fully with the energy market, allowing co-optimisation of energy and system services, cross-market coordination (such as with gas) and optimising a much more complex and diverse resource mix including facilitating the transition to a two-sided market, potentially leading to overall lower cost of electricity to consumers.

While ahead markets in some form will be implemented prior to 2025, it is important that the various options developed are considered as part of the work to identify interdependencies between workstreams (discussed below).

E. Two-sided Markets – AEMC + AEMO

The AEMC and AEMO are leading the workstream to develop a two sided market. Final recommendations on a market design will be made to Energy Council by the end of 2020.

A two-sided market is a market model that promotes direct interaction between suppliers and customers. There are a number of benefits to consumers from progressively moving to a two-sided market, who will be better able to manage their consumption and costs. It will also provide the economic signals necessary to enable consumers to release the full value of DER.

There is also a range of benefits to the market more generally. More accurate and up to date information on both the supply and demand sides would enhance the ability for market participants to make informed decisions and assist AEMO in maintaining the safe, secure and reliable operation of the power system.

A two-sided market encourages price responsiveness and demand flexibility which serves to improve matching of supply and demand across time. This in turn might remove, or at least reduce, the need for operational interventions by AEMO, or in market re-design.

Greater flexibility through exposure to price for all participants can enhance the efficiency and robustness of the market. Not only is this efficient but helps maintain system security and reliability.

F. DER Markets – ESB + DER INTEGRATION STEERING COMMITTEE

Scope for this program is currently under development.

G. CoGaTI – AEMC

The CoGaTI review will substantively address the key challenge of integrating variable renewable energy (VRE) into the electricity system. The CoGaTI reforms are planned to commence in 2025, allowing implementation to be considered along with other reforms identified by the p2025 project.

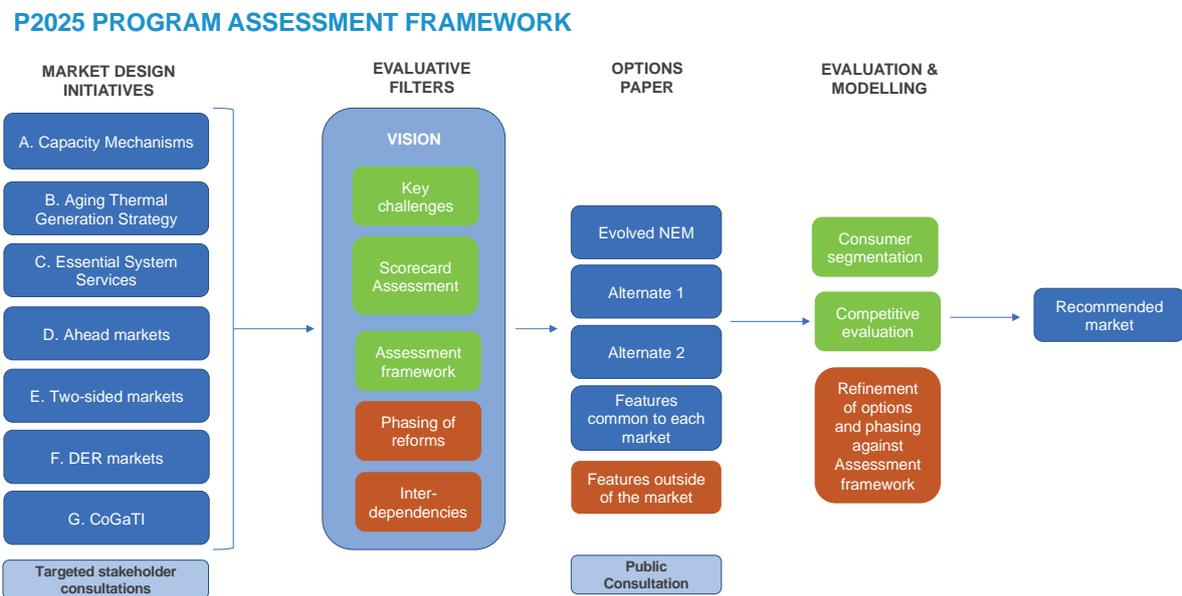
Assessment framework

Figure Two below provides a high level overview of the assessment framework proposed to evaluate the multiple initiatives contained within the Post-2025 program.

We note that some of the market design initiatives are at a more advanced stage, e.g. CoGaTI, and elements of others are likely to be progressed and implemented earlier than 2025, e.g. ahead markets and two-sided markets.

However, it is important that the broad suite of initiatives are considered together during the evaluation phase so that interdependencies can be understood and coherent market design combinations be proposed in mid-2021. Further, it is important to note that decisions on market design that have already been made will not be revisited at this stage, but rather will be built as foundations into options for future market design.

Figure Two – Overview of Program Assessment Framework



Proposed Evaluation Assessment approach

Assessment of interdependencies

It is intended that as part of the design process, a regular assessment is made regarding the congruency of initiatives; i.e. where interdependencies exist, how each initiative interacts and impacts

with others, rather than considering each initiative separately. Note, this aspect of the assessment does not consider the 'substance' of each initiative, but rather considers how each interacts with each other, as well as with other reforms or reviews currently underway across the energy sector. By building this into the design phase of the program, it is intended that potential issues relating to system or process interdependency (for example) can be identified and addressed earlier in the process.

A proposed framework for enabling such assessment has been developed by KPMG (commissioned by the Australian Energy Council), and submitted for consideration as part of the Post-2025 Issues Paper consultation.¹ This paper provides a useful framing of how to consider interdependencies and is intended to be used as a base for this process.

In its submission, KMPG/AEC noted that an outcome from applying such a framework is to demonstrate the need for coordination and alignment between reforms holistically rather than individually, prompting more thorough analysis on the interactions and flow-on effects of each change to the market. Given the wide-ranging nature of the reform initiatives being considered, the use of such a framework appears appropriate and likely to enable a more fulsome consideration of the long-term impacts on customers and the broader community.

A valuable outcome of using an evaluation tool to assess the congruency of proposals, is likely to be a more objective and structured basis for identifying priority initiatives for the short-medium term, including phasing of initiatives for the longer term (i.e. for either technical or regulatory reasons).

Scorecard assessment

To support the evaluation of the market design options, it is proposed each of the initiatives will be assessed via a 'balanced scorecard' approach, assessing how each achieves the P2025 program vision and objectives. We note similar scorecard approaches have been used in assessing the relative merits and value of a range of other different policy initiatives.²

The scorecard objectives will build on challenges identified in the Post-2025 Issues Paper consultation,³ and also include consideration of how well consumer challenges being experienced within the existing market settings are addressed (e.g. energy affordability, complexity, energy equity etc) by proposed market design options.

In developing the scorecard, it is intended that objectives will build on the strategic priorities identified by the ESB in its Strategic Energy Plan (see below).

- *Affordable energy and satisfied consumers*
- *Secure electricity and gas system*
- *Reliable and low emissions electricity and gas supply*
- *Effective development of open and competitive markets*
- *Efficient and timely development in networks*
- *Strong but agile governance*

The balancing of these objectives will necessarily be a mix of qualitative and quantitative assessment, and it is recognised that careful trade-offs will need to be made involving a number of diverse stakeholders.

¹ See KPME-AEC report here: <https://www.energycouncil.com.au/media/17223/coordinating-electricity-market-reform-full-report-final.pdf>

² For example, see Balanced Customer Scorecard developed by the ENA and CSIRO in their Electricity Network Transformation Roadmap, 2017.

³ <http://www.coagenergycouncil.gov.au/publications/post-2025-market-design-issues-paper-%E2%80%93-september-2019>.

By introducing and using such an evaluation tool, we envisage that this will enable a more open engagement with stakeholders regarding the assessment process and support more robust outcomes. Our intention is to build regular workshop check-ins with stakeholders (via the Technical Working Group (TWG) and Advisory Group (AG)) to identify issues of potential interdependency over the development phase also.

Market Design – Options papers

Following evaluation, based on the range of initiatives emerging that best facilitate achievement of the P2025 program objectives, a set of market design options will be developed for consideration.

These options may have common elements, but include variants that propose phasing of initiatives over different timeframes to advance the achievement of certain objectives over others. It is proposed that once market design 'Options' are developed, detailed modelling would be carried out to determine appropriate phasing over different timeframes. The modelling requirements will differ depending on the design, and would be determined by the market bodies together with the ESB.

Program Delivery

ESB will continue to carry out an overseeing and coordination role to support development and delivery of initial design options.

Regular webinar check ins with the TWG and AG are currently being put in place to keep stakeholders up to date with developments across the P2025 program, and provide opportunities for feedback and input.

A P2025 program consultation is planned for August 2020. This consultation is intended to cover the program vision and objectives, and provide an overview on developments and interdependencies identified across initiatives. Separate consultations relating to individual initiatives may also be released as necessary by project lead organisations.

Market design options will be developed for consultation by end 2020. It is envisaged that to support this process, dedicated resources would be pooled from ESB and market bodies (and potentially stakeholders for a 6-8 week period), with defined timetable and key reporting milestones updates back to ESB and Energy Council. Note that timing is yet to be confirmed in recognition of reduced capacity by stakeholder representatives and market bodies at the current time.

Recommendations on market design (including proposed timeframes for delivery and out of market design recommendations) will be provided to Energy Council in mid 2021.

Appendix A

Overview of Post-2025 workstream initiatives.

Each workstream will be overseen by the p2025 project Internal Working Group (IWG) with day to day guidance provided by the workstream leaders. It will involve consultation with the Technical Working Group (TWG) and Advisory Group (AG) and public consultation as appropriate.

A. Investment signals for reliability (Capacity Mechanisms)

Workstream leaders: AEMC + ESB

This workstream is evaluating the case for introduction of a mechanism to incentivise investment in resources. The workstream will:

- Analyse the nature of challenges Australia's energy-only wholesale market will face in bringing on the significant investment in new energy resources.
- Assess the case for introducing a mechanism to incentivise investment in resources, or investment in specific types of resources could play in the transition and the benefits and drawbacks of moving away from an energy-only market. This will include the possible contribution to, and impact on, the wholesale market of small-scale distributed energy resources.
- Undertake an evaluation of specific mechanisms to incentivise investment in additional resources given the likely evolution of Australia's electricity market, the current and planned NEM design and settings, the risks and incentives faced by market participants, Australia's regulatory settings and the behavioural norms that govern market behaviour.

This analysis will offer a long-term view on the questions of how best to ensure resource adequacy (reliability) and is closely related to reliability review discussed at Energy Council meeting in March.

B. Aging Thermal Generator Strategy –

Workstream leader: ESB

The focus of this work will be on the market arrangements and regulatory approach to ensuring that sufficient replacement capacity and system services are available to replace large, aging thermal generators as they exit the NEM. The work will examine:

- the capacity, energy and services thermal generators currently offer the market (nameplate and in practice).
- the current arrangements to incentivise replacement capacity, and impacts on wholesale and consumer prices
- evaluation of the need for and efficacy of possible alternate market mechanism and associated regulatory arrangements to provide greater confidence that replacement capacity will be available - reliability must run, bonds etc...

This analysis will be conducted in close coordination with the workstream examining investment signals for reliability and essential system services.

C. Essential System Services

Workstream leaders: AEMO + ESB

This workstream will build on the interim measures relating to system security approved by the Energy

Council at its March meeting. The focus of this work will be to develop an enduring regulatory framework that will enable the market operator to meet future system services needs. This framework will be applied to provide advice on:

- future system service requirements in the 2025 timeframe;
- identify and define new system services that may be needed
- develop and deploy mechanisms to efficiently source system services.

The workstream will conduct the following analysis:

1. Describe the drivers (in terms of the physics and operations of the NEM) for the introduction or modification of services for system security (that have historically been delivered by synchronous generators as a by-product of their participation in the energy market).
2. Confirm the analysis of future system services requirements and describe new services that will be need to be provided or existing services.
3. consider how new services should be planned, paid for, valued and procured, given the trends in the physical system.
4. Informed by steps 1; 2; and 3, develop options for a regulatory framework that is flexible and can adapt to changing service requirements and technology evolution, effectively and with minimal reform processes. The regulatory framework should include roles, responsibility and processes to embed steps 1, 2 and 3 into the regulatory process on an ongoing basis so that system services continue to evolve with the NEM

D. Ahead Markets

Workstream leaders: AEMC + AEMO

Market processes will need to be enhanced to coordinate the scheduling of all resources so that the full needs of the system (including energy and the essential system services) can be provided in a co-optimised way that minimises the cost of delivery. A form of ahead mechanism is considered essential for improving visibility of and confidence in the provision of all the system's needs.

Ahead mechanisms are market-based mechanisms that are run in advance of real-time and increase certainty for participants while giving AEMO more scheduling options to mitigate uncertainty and the risk of shortfalls in system service in real-time.

The ESB considers that security constrained economic dispatch of energy-only is, by itself, no longer sufficient to maintain system security. The ESB considers that new system services need to be established and remunerated and an ahead market is required to ensure system security going forward.

Advice will be provided to Energy Council on options to introduce ahead markets by the end of 2020. This work will be jointly developed by the AEMC and AEMO.

While ahead markets in some form will be implemented prior to 2025, it is important that the various options developed are considered as part of the work to identify interdependencies between workstreams.

E. Two-sided Markets

Workstream leaders: AEMC + AEMO

A two-sided market offers the best opportunity to meet the reliability requirements in an efficient manner and will contribute to system security. It will also provide the economic signals necessary to enable consumers to release the full value of DER.

Digitalisation provides an opportunity to change the way (generation) reliability is treated in the NEM. In a fully digitalised world, instead of relying on a system-wide standard, individual customers could nominate their own preferred level of reliability. One way this could be signalled to

retailers is as a tolerance for different outage lengths at different times of the day or week. Revealing to a retailer a higher tolerance for outages should result in the customer being shown the (estimated) saving the customer will receive while a lower tolerance would reveal the (estimated) size of the increase.

On the basis of these customer-revealed tolerances for outages, individual customers or an approved third party (e.g. aggregators or retailers) could automatically adjust demand bids and rotate outages around customers so generation always meets demand while ensuring all customers receive the level of reliability they want. This additional digitalisation and technology change would enable a more dynamic and individualised provision of reliability. If customers revealed higher tolerances for outages than implied by the existing reliability standard then this would reduce the cost of electricity for all consumers. Even if the costs increased (everything else being equal) it would be efficient because customers were demanding higher levels of reliability than the existing system was delivering.

Such a system would reduce the administrative and operational costs involved in centrally setting the reliability standard and AEMO procurement of last resort resources.

The ESB considers that a two-sided market framework should be developed as soon as possible for Energy Councils' consideration by the end of 2020. This work will build on existing work by AEMC and AEMO on demand response.

Over the coming months, the ESB and market bodies will concurrently continue to develop the ahead and two-sided market designs, evaluating the various options to identify a recommended design by the end of 2020. This work will be informed by and coordinated with the 2025 work program, and other work streams being carried out by the market bodies.

There will be two critical parts of this work on developing the ahead and two-sided markets:

- The assessment framework that will be used to evaluate options. This assessment framework will be consistent with that developed for the 2025 project. It will also include an assessment of the potential costs, benefits and trade-offs of the various options.
- Determining the transitional pathway for what will be a significant change to the market to maximise benefits while also minimising impacts to consumers and market participants. Each of the papers provided to Energy Council highlights potential transitions and these will be explored further during the next phase of work.

F. DER Markets

Workstream leaders: ESB + DER INTEGRATION STEERING COMMITTEE

Scope for this program is currently under development.

G. CoGaTI

Workstream leaders: AEMC

The CoGaTI review will substantively address the key challenge of integrating variable renewable energy (VRE) into the electricity system.

The reforms specifically address wholesale pricing, introducing a system of locational based pricing for scheduled generators, financial risk management through the introduction of financial transmission rights that can be purchased by generators.

The review no longer addresses transmission planning, which will continue to be done through existing processes.

The CoGaTI reforms are planned to commence in 2025, allowing implementation to be considered along with other reforms identified by the p2025 project.

