

30 September 2019



Dr Kerry Schott AO
Independent Chair
Energy Security Board
COAG Energy Council Secretariat
John Gorton Building
King Edward Terrace
PARKES ACT 2600

Dear Dr Schott

Energy Security Board Post 2025 Market Design Issues Paper

Energy Queensland welcomes the opportunity to provide comment in response to the Energy Security Board's consultation on the Post 2025 Market Design issues paper. The issues paper is in response to a request from the Council of Australian Governments Energy Council to provide advice on "a long-term, fit-for-purpose market framework to support reliability, modifying the National Electricity Market 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 participation".¹

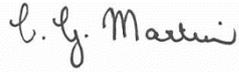
Energy Queensland is supportive of the Energy Security Board's Post 2025 Market Design project. It is clear that, in line with global trends, Australia's energy market is in the midst of a rapid and profound transformation. Technological developments, declining costs and changing consumer attitudes are driving a shift towards large-scale and distributed renewable energy sources, energy storage and efficiency and smart energy management systems. Given that the future landscape for energy generation and consumption is likely to be significantly different from today, it is timely that the future of the energy market in Australia is examined to ensure it is fit-for-purpose and capable of delivering safe, secure, reliable and affordable electricity to consumers and the community.

Energy Queensland's comments on the analytic approach the Energy Security Board proposes to apply to the project and the key challenges material to market design post 2025 are contained in the attached submission. However, given the significant nature of this project and the current expedited delivery timeline, Energy Queensland would welcome engaging with the Energy Security Board directly to further expand on the comments provided in this submission if this would be of benefit.

¹ COAG Energy Council, *Energy Security Board: Post 2025 Market Design Issues Paper*, September 2019, p.3.

Should the Energy Security Board require additional information or wish to discuss any aspect of Energy Queensland's submission, please do not hesitate to contact me on (07) 3664 4105.

Yours sincerely



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Encl: Energy Queensland submission to the issues paper

Energy Queensland

Submission to the
Energy Security Board

Post 2025 Market Design

Energy Queensland Limited
30 September 2019



About Energy Queensland

Energy Queensland Limited (Energy Queensland) is a Queensland Government Owned Corporation that operates a group of businesses providing energy services across Queensland, including:

- Distribution Network Service Providers, Energex Limited (Energex) and Ergon Energy Corporation Limited (Ergon Energy);
- a regional service delivery retailer, Ergon Energy Queensland Pty Ltd (Ergon Energy Retail); and
- affiliated contestable business, Yurika Pty Ltd (Yurika).

Energy Queensland's purpose is to safely deliver secure, affordable and sustainable energy solutions with our communities and customers and is focussed on working across its portfolio of activities to deliver customers lower, more predictable power bills while maintaining a safe and reliable supply and a great customer experience.

Our distribution businesses, Energex and Ergon Energy, cover 1.7 million km² and supply 37,208 GWh of energy to 2.1 million homes and businesses. Ergon Energy Retail sells electricity to 740,000 customers.

The Energy Queensland Group also includes the new energy services business Yurika which will provide customers with greater choice and control over their energy needs and access to the next wave of innovative technologies and renewables.

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1 Introduction

On 2 September 2019, the Energy Security Board (ESB) published the *Post 2025 Market Design Issues Paper* (issues paper). The ESB's issues paper is in response to a request from the Council of Australian Governments Energy Council to provide advice on “a long-term, fit-for-purpose market framework to support reliability, modifying the National Electricity Market 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 participation”.¹

The issues paper discusses the analytic approach the ESB proposes to apply to the project and five key challenges material to market design post 2025, namely:

- driving innovation to benefit consumers;
- investment signals to ensure reliability;
- distributed energy resource integration into the electricity market;
- system security services and resilience; and
- integration of variable renewable energy into the power system.²

The ESB has requested that interested parties make submissions on the issues paper by 30 September 2019. Specifically, the ESB has requested feedback on possible future scenarios and assessment criteria as well as potential opportunities, challenges and risks that will need to be considered in developing any potential future market designs or reforms.³

Energy Queensland's comments in response to the issues paper are provided in sections 2 and 3 of this submission. We are available to discuss this submission or provide further detail regarding the issues raised.

¹ COAG Energy Council, *Energy Security Board: Post 2025 Market Design Issues Paper*, September 2019, p.3.

² Ibid, 3.

³ Ibid, 3.

2 General comments

Energy Queensland is supportive of the ESB's Post 2025 Market Design project. It is clear that, in line with global trends, Australia's energy market is in the midst of a rapid and profound transformation. Technological developments, declining costs and changing consumer attitudes are driving a shift towards large-scale and distributed renewable energy sources, energy storage and efficiency and smart energy management systems. Given that the future landscape for energy generation and consumption is likely to be significantly different from today, it is timely that the future of the energy market in Australia is examined to ensure it is fit-for-purpose and capable of delivering safe, secure, reliable and affordable electricity to consumers and the community.

Energy Queensland is already actively responding to the impacts of current energy market trends, with much of our forward planning focussed on strategies to enable greater integration of new technologies and support positive outcomes for customers and the wider community. For instance, in Queensland:

- We have already integrated the highest penetration of residential solar photovoltaic (PV) systems in Australia, with Queensland believed to have the highest residential solar PV penetration of any state in the world. As at June 2019, there were just over 560,000 customers with solar PV connected to Energy Queensland's networks with a total capacity of 2.8 gigawatts (GW).
- Ergon Energy currently has 104 active export generation projects in progress, mostly for utility-scale solar farms connecting to the distribution network, while in the South-East, Energex has eight enquiries for solar PV inverter systems over 1 megawatts (MW).
- There is significant ongoing activity around the development and deployment of complementary battery storage technology, with over 32 MW hours of energy storage installed over the last 12 months, more than double the volume installed in the previous 12 months.
- There are now over 2,000 electric vehicles, with a 55 / 45 split between battery and plug-in hybrid electric vehicles, and this number is confidently forecast to double within six months.
- Energy Queensland has a total of 874 MW of diversified load under control via demand management programs, with both Energex and Ergon Energy having successfully utilised demand management to reduce or defer network expenditure while improving customer outcomes.

In future, while solar PV is expected to continue to increase (including both rooftop solar PV and large-scale solar, particularly in our rural areas), battery storage and electric vehicles will emerge in higher penetrations as costs continue to fall and customers are able to benefit from these technologies.

Research suggests that if these trends continue as expected (i.e. where there is fast adoption of decentralised systems), the number of customers who have adopted solar PV will increase from current levels by more than 50 per cent by 2030, and significant penetrations of battery storage and electric vehicles will emerge across our networks over the same period. Energy Queensland is forecasting that by 2030 there could be more than 5 GW of solar PV capacity connected to distribution networks in Queensland, including on residential and commercial premises and in solar farms. This future will present both challenges and opportunities for networks and the broader market and will need to be supported by appropriate technological and market mechanisms to ensure customers' investments achieve efficient outcomes not only for the customer but also the energy system as a whole.

In light of likely technology penetrations, Energy Queensland's strategy prioritises embracing change and future technologies and upskilling our workforce so we can be a trusted partner in delivering the energy needs of the future for our communities and customers. Initiatives we are already working on to prepare for 2025 and beyond include delivering:

- Affordability and simplicity for our customers;
- Lower network prices;
- More choice and control for customers, with new retail products, simpler billing and information to enable more informed decisions;
- Improved customer connection processes; and
- A secure and safe by design network.

However, as it is expected that the rate of change will occur at an extraordinarily accelerated pace and will be difficult to predict, it is essential that the overall market and regulatory framework is suitable to enable participants to meet future challenges, while maintaining reliability and affordability for customers.

Energy Queensland agrees that it is not efficient to continue layering incremental changes on the existing framework and that a holistic approach is required. We also note that the ESB considers that changes should continue to be made to market and regulatory

arrangements while the comprehensive review of overall market design is underway.⁴ In this regard, and noting the significant energy market reform projects currently in progress or being implemented, Energy Queensland also agrees that any interim regulatory reforms should be limited to only those that are critical for addressing an urgent need and will further enable market reform to meet future challenges. Energy Queensland considers that:

- Customers should not be exposed to an additional financial burden as a result of inefficient delivery of or adverse impacts from market reforms and, therefore, care should be taken to ensure that unnecessary costs are not imposed on participants through non-critical system and process changes in the short-term that are likely to become redundant in the longer-term as the market continues to evolve;
- The risk of inefficient outcomes or duplicated investment needs to be considered as additional participants, with potentially competing objectives, are introduced;
- Similarly, to avoid inefficient outcomes, any proposed reforms must be coordinated with and complementary to the other reforms and initiatives currently underway;
- Where possible, any costs should be recovered from the party receiving a benefit in a way that reflects the service being provided and avoids this cost being recovered from other participants;
- It is essential that any market design should retain sufficient focus on systems resilience and disaster response capability to reflect the nature of electricity as an essential service;
- Any market reforms should enable the free flow of capital to appropriate investments as well as provide certainty to encourage investment; and
- The regulatory framework should not become an inhibitor to the overall transformation of the electricity segment.

Energy Queensland notes and supports the fact that the terms of reference for this review include consideration of and engagement with all aspects of the energy supply chain. A key component of the post 2025 market design should be clarification of the roles and opportunities for different network segments (i.e. transmission and distribution) in enabling a high renewables future. While the Australian Energy Market Operator's (AEMO's) *Integrated System Plan* (ISP) has been listed as the starting point for scenario analysis for

⁴ COAG Energy Council, *Energy Security Board: Post 2025 Market Design Issues Paper*, p. 7.

market design, Energy Queensland cautions that the 2018 ISP is heavily transmission network-focussed and has limited consideration of distribution networks and the associated impacts and opportunities. While the 2019 ISP is clearly forming a more granular view of the growing impacts of renewables, the increasingly distributed nature of generation warrants a whole-of-system design to ensure an optimised outcome for customers and markets across the entire supply chain. The volume of utility-scale renewables connected to the Energex and Ergon Energy networks and the volumes of 66 kV, 110 kV and 132 kV assets owned and operated by Energex and Ergon Energy, for example, highlight the need for overall system consideration and optimisation. The role of distribution networks is becoming increasingly complex as the growth of renewables drives a range of challenges that networks need to actively manage.

Further, Energy Queensland considers that additional work is required to support post 2025 market design, including:

- An approach for clarification and support of “no regrets” actions around enabling higher penetrations of distributed energy resources, such as appropriate technology to support increased low voltage network visibility, network monitoring and control and tariff reform, as described in the issues paper;
- Review of the regulatory justification for implementing these actions, as the accurate forecasting and justification of avoided costs is challenging within the current framework; and
- The ability for networks to respond to changing customer and market requirements and to make changes within a five-year regulatory control period given the rate of change across the industry.

In the meantime, Energy Queensland’s distribution network businesses, Energex and Ergon Energy, will continue to leverage their considerable demand management and demand response capabilities to complement efficient network investment whilst maintaining secure and reliable networks. This capability includes using load control to not only reduce local peaks but also turn loads on in local areas of high PV export to enable greater levels of PV penetration. In line with recent market reforms, the network businesses are actively working with third parties and customers to evolve their programs to ensure they can continue to efficiently leverage customer-led investment. The networks are also participating in the *Open Energy Networks* program currently being undertaken by Energy Networks Australia and AEMO which is exploring the “no-regrets” actions required to continue to successfully integrate growing numbers of distributed energy resources into the grid at lowest cost to all consumers.

With respect to future consultation on market design, Energy Queensland recommends that timeframes for response should be extended to allow stakeholders sufficient time to provide a considered and meaningful response to what are likely to be wide-ranging and complex issues. The recent release of the Australian Energy Market Commission's final report on the *Economic Regulatory Framework Review: Integrating Distributed Energy Resources for the Grid of the Future*, which is aligned with the ESB's market design review, and the broad array of transformational work currently being undertaken across the industry, highlights the need for a measured and thorough consideration of issues that are critical to the future of the Australian energy market. Furthermore, Energy Queensland notes that the issues paper references a wide range of work that the ESB is considering in its market design approach, but it is unclear whether the ESB considers this work should be used as key reference pieces leading transformation, or whether it plans to use the research as inputs into subsequent consultations. Guidance on what the ESB views as key policy work will assist in identifying priority areas for focussed engagement and consultation.

To assist in the achievement of the ESB's objective, Energy Queensland has provided specific comments on the issues raised for consultation in section 3 of this submission. Noting the significant nature of this project and the current expedited delivery timeline, Energy Queensland would welcome engaging with the ESB directly to further expand on the comments provided in this submission if the ESB considers this would be of benefit.

3 Detailed comments

Energy Queensland provides the following comments on the questions raised in the issues paper for further consideration by the ESB:

ESB Question	Energy Queensland Response
ANALYTIC APPROACH	
<ul style="list-style-type: none"> What scenarios and shocks should be used? How should these be used to test market design? 	<p>Energy Queensland is expecting that distributed energy resources will continue to be adopted by our customers. Consequently, any new policies that apply to distributed energy resources, either to encourage, discourage or change operational behaviour, need to consider impacts on all customer segments and the tensions that may arise.</p> <p>The testing of future market designs must consider all impacts on the entire market framework and ensure that the flow-through implications do not cause unintended consequences for any parts of the supply chain, such as retailers, customers or aggregators responding to national market signals and causing a need to invest in local networks. Additionally, future market designs should identify and address any barriers that currently exist to enabling local, state and national market signals to flow through to customers and thereby allow further choice.</p> <p>Energy Queensland recommends that any modelling should adopt an agent-based approach that models how behaviours and attitudes of market participants and customers will drive adoption of technology and how this technology will manifest in different ways at a localised level, not just at a system level. Electricity networks need to manage a range of challenges simultaneously (e.g. local areas of peak demand growth together with local areas of high renewables and PV export) depending on how technology adoption emerges. Such localised challenges may not be picked up at an aggregated system-level modelling approach and have the potential to result in significant unintended expenditure if not appropriately managed.</p>

ESB Question	Energy Queensland Response
	<p>Furthermore, modelling should also consider how market settings and signals, such as cost-reflective tariff reform, will impact customer behaviour and attitudes to technology adoption and integration with the broader electricity system. The continuation of inefficient signals or signals that exacerbate customer distrust could incentivise inefficient technology adoption which flows through to overall electricity system costs. Such settings and behavioural impacts should be assessed to explore the implications of tariff reform and electricity prices in longer-term market design.</p> <p>Shock scenarios should consider national energy security issues, such as:</p> <ul style="list-style-type: none"> • Global energy supply; • Disconnection of large volumes of customers from the National Electricity Market via embedded networks or stand-alone power systems; • Response to natural disasters or “black-swan” events as the operating environment becomes increasingly uncertain; • Unexpected loss of baseload generation plants through unforeseen events; and • Coordinated cyber security attacks on distributed energy resources to destabilise the national grid.
<ul style="list-style-type: none"> • How can market and economic modelling best be used to evaluate individual components of market design or the end-to-end market design? 	<p>In order to maximise the benefits of market and economic modelling, Energy Queensland recommends that:</p> <ul style="list-style-type: none"> • Economic models and system model designs should be socialised with the industry for review and to enable independent modelling to evaluate the risk of unexpected consequences; • Care should be taken not to preference one part of the supply chain over others and to consider what aspects of the supply chain can support a competitive market and what aspects should be managed as a natural monopoly;

ESB Question	Energy Queensland Response
	<ul style="list-style-type: none"> • Consideration should be given to differences applied to registered generators, i.e. depending on whether they connect to a distribution network or transmission network; • Scenarios and modelling should consider emerging challenges at all levels of network connections, noting that some of the transformational work referenced in the issues paper, such as the <i>Distributed Energy Integration Program</i>, is more focussed on the emergence of distributed energy resources at the lower ends of the distribution network while Energy Queensland is seeing growth in renewables at all levels of network connections; • Scenarios should be appropriately granular and socialised such that all market participants can use them to assist in their own internal modelling and, for example, inform responses to regulatory consultations or develop products and customer offerings; • Market and economic modelling should not occur independently of technical modelling as the best economic outcome may not always be feasible or may result in perverse technical or commercial outcomes; • Where possible, modelling should assume costs are recovered from the party receiving the benefit to avoid costs being recovered from other participants; • Economic modelling should also leverage behavioural modelling as consumer adoption of technology may not follow economically rational decisions, especially with respect to retail adoption and usage of distributed energy resources; and • As noted earlier in this submission, modelling needs to consider localised as well as system level impacts to ensure overall expenditure is optimised.

ESB Question	Energy Queensland Response
<ul style="list-style-type: none"> Is the assessment framework appropriate to evaluate the effectiveness of future market designs? What else should be considered for inclusion in the assessment framework? 	<p>Energy Queensland agrees that ensuring the satisfaction of the National Electricity Objective should be the basic over-arching principle for the Post 2025 project. We are also broadly supportive of the potential assessment framework principles highlighted for consideration in the issues paper.</p>

AUSTRALIA'S ENERGY TRANSITION AND IMPLICATIONS FOR MARKET DESIGN

<ul style="list-style-type: none"> Have we identified all of the potential challenges and risks to the current market? If not, what would you add? 	<p>Energy Queensland suggests including the following challenges and risks:</p> <ul style="list-style-type: none"> The cyber security risk associated with high volumes of distributed energy resources that, when aggregated, can have a significant impact on system stability and market performance; Challenges associated with transferring benefits and / or costs, or aggregating benefits across a diversified supply chain which is proving complex, especially where individual cost / benefits can be outside a customer's interest and the nature of a shared asset is that investment costs are shared across a broad range of customer types; Differences between jurisdictional policy and national rules and policy which result in inconsistencies and conflicts; Ensuring that equitable access to electricity as an essential service remains a priority; The complexity of market rules and the fragmentation of supply chains intended to increase competition and market development, which can limit customers' opportunity to participate where there is no proven market or market history; and Challenges in coordinating multiple participants in the provision of demand management and managing the risk of inefficient investment, with a view to enabling
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ESB Question	Energy Queensland Response
	<p>distributors, such as Energex and Ergon Energy, to continue to extract value from existing demand management programs and work with new participants on future projects to allow further value to be captured.</p>
<ul style="list-style-type: none"> Which of these challenges and risks will be most material when considering future market designs and why? 	<p>Energy Queensland considers that supporting and managing the continued uptake of distributed solar PV, utility-scale renewables, battery storage and electric vehicles by our customers is likely to be one of the most significant technical and economic impacts that will flow through the electricity system to 2030.</p>
<ul style="list-style-type: none"> Which (if any) overseas electricity markets offer useful examples of how to, or how not to, respond to the challenges outlined in this paper? 	<p>Energy Queensland supports looking at overseas markets that may be fit-for-purpose and relevant to the Australian market. In addition to the overseas markets noted in the issues paper, Energy Queensland considers that the Hawaiian, and other similar markets with growing penetrations of centralised and decentralised renewables, may also provide useful insights into the regulatory options being explored to support a higher use of renewables.</p>