30 September 2019

Dr Kerry Schott AO
Chair
Energy Security Board

Lodged by email: info@esb.org.au

Dear Dr Schott,

POST-2025 MARKET DESIGN – ISSUES PAPER

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in renewable energy and energy storage along with more than 6,000 solar and battery installers. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner.

The CEC welcomes the opportunity to comment on the Energy Security Board's (ESB's) post-2025 market design issues paper. The Australian energy system is undergoing an unprecedented transition. It is timely to consider whether adjustments to the market framework are needed to ensure it is fit for purpose for this transition and beyond.

The transition will see the progressive retirement of a number of large thermal generators at the same time that significant technological advancements occur, consumer expectations change and demand-side participation increases. In the face of this, policy and market settings need to ensure we can deliver on the current challenges of securing the energy system, ensuring affordable energy supply to consumers and lowering emissions to meet Australia's international commitments. Renewable energy and storage technologies are well placed to address all three challenges. The CEC believes we can transition Australia's energy sector to a lower emissions future, without compromising the delivery of reliable and affordable energy to consumers. As such, it is important that the market framework can support renewable energy and storage technologies entering the market and integrating into the system at least cost, in particular before existing generation exits. The CEC also believes that renewable energy and storage technologies play an important role in addressing each of the five challenges identified in the issues paper.

The remainder of this submission addresses different matters raised in the issues paper. If you would like to discuss any of the issues raised in this submission, please contact me on the details below.

Yours sincerely,

Lillian Patterson
Director Energy Transformation
(03) 9929 4142
lpatterson@cleanenergycouncil.org.au

1 | Analytic approach

a) Consultation

The issues paper provides some detail on the project delivery timeline. First, the project will identify two potential fit for purpose market frameworks for evaluation against each other and the National Electricity Market (NEM) design by early 2020. It will then recommend a package of measures to adapt the existing market design or alternative market designs at the end of 2020. Consultation and development of any changes to the National Electricity Law and National Electricity Rules will then occur from 2021.

In addition to being ambitious, this timeline is unclear on stakeholder engagement. The CEC suggests the ESB provide greater detail on the stakeholder engagement process that will occur throughout the project delivery timetable. The ESB has established an Advisory Panel and Technical Working Group to support the project (the CEC is a member of the latter) and we understand both are meeting regularly to discuss project issues. We are supportive of this but given the far-reaching nature of this project and the potential for significant reform to existing market arrangements, it is critical that all stakeholders have an opportunity to engage in this process both through written submissions and directly with the ESB and other stakeholders. The ESB should provide indicative times for the different stakeholder consultation points, specifically when consultation papers will be released and the length of the succeeding consultation period. These should be accompanied by a public forum similar to those undertaken during the development of the National Energy Guarantee where the ESB can provide an overview of current consultation matters and hear from a range of stakeholders. Stakeholder engagement is critical to the success of the post-2025 market design project so a clearly defined stakeholder engagement process will enhance stakeholder confidence in the development process and allow stakeholders to prepare and plan for consultation periods.

The CEC understands the next step in the post-2025 market design project is a paper, planned for November 2019, to commence the next round of consultation on the market design options to be assessed in addition to the current NEM design. This implies a significant leap in project development in a very short time from this issues paper, which sets out the five key opportunities and challenges, to a paper, which will outline viable options for a potential future NEM design. We recommend that the next paper should canvas the range of options, potentially across some form of spectrum, that have been considered in the paper's development and how the ESB has settled on the two selected market design options. While it may be the case that the Advisory Panel and Technical Working Group will be more actively engaged in the development of options prior to the next paper, the wider range of stakeholders will not have been involved in these discussions and so need an insight into the rationale for the options presented in the paper. This will assist stakeholder responses to the next paper. A longer than usual consultation period should follow the next paper in order that stakeholders can provide well considered responses to what is likely to be quite a hefty paper.

b) Scenarios and modelling

The CEC generally supports the scenarios and modelling approaches outlined in the issues paper. In relation to scenarios, we support the post-2025 market design project using the Australian Energy Market Operator's (AEMO's) Integrated System Plan (ISP) scenarios as the starting point for investigating possible future market designs across different technological scenarios. Sensitivity analysis, however, becomes vitally important given scenarios cannot provide perfect foresight into possible futures. This is evident from the fact that if this project had been undertaken five to ten years ago, we would have been considering a very different range of scenarios to what has actually transpired over those years to today. A range of sensitivities should be assessed. In particular, this should include the earlier retirement of thermal generation capacity before it reaches the end of its technical life and accelerated cost reductions for new technologies, particularly for both utility and small-scale generation and storage costs.

We also recommend that the scenarios and modelling to support the post-2025 market design project should include climate change scenarios. The issues paper rightly acknowledges that the potential impacts of climate change on the performance of the system heighten certain risks. Climate change also has consequences for consumer behaviour and technological advancement so is an important consideration in this process. Climate change scenarios should include the impact of more extreme and frequent weather events on the energy system.

c) Assessment framework

The CEC generally supports the proposed assessment framework outlined in the issues paper noting that given the large number of principles, tensions between principles are inevitable and therefore trade-offs between different principles will need to be considered.

With respect to the risk allocation principle, it is important to note that not all parties see risk in the same way. This must be considered when assessing which party is best placed to manage a particular risk.

The assessment framework should explicitly seek to ensure that existing assets are made no worse off than under current arrangements. If market reforms penalise existing asset owners, investor confidence will be diminished and generation capacity could be withdrawn from the market. The consequence of this is that greater incentives will be required in the future to encourage essential investment in generation assets. These incentives will either need to be higher revenues for power generated or explicit support schemes. Both represent inefficient outcomes where costs would ultimately be passed on to consumers.

While not an assessment principle in itself, it is important that the assessment of options should identify any wealth transfers. This relates to the above point and is linked to the principles of technology neutrality and competitive neutrality. Winners and losers are possible with any regulatory reform. There must be a clear discussion of this to ensure no particular sector or series of players is unfairly disadvantaged and that the new arrangement still facilitates an overall net benefit.

The assessment process for the market design options must recognise that while efficient markets are preferable, market failures exist and it may be more efficient and least-cost for a mandated and/or centrally coordinated approach. This should also recognise that the electricity supply chain combines competitive generation and retail sectors with monopoly transmission and distribution networks. Examples to illustrate this include:

- The ISP provides a long-term and nationally-coordinated approach to forecast system developments required for the NEM over the next 20 years. It identifies the transmission investments that will support the least cost portfolio of resources necessary to meet consumer demand over this period. The ESB's ISP action plan effectively activates the ISP in order that efficient transmission investment objectives can be met for monopoly assets.
- There could be instances where a regulated approach produces a more efficient outcome than a market-based arrangement. This can take the form of a mandated requirement on a competitive element of the supply chain, such as generators, or on a monopoly asset, such as Transmission Network Service Providers (TNSPs). There may be cases where having a mandated requirement on a monopoly asset at the network level may produce greater overall efficiencies than an approach aimed at the generation sector, for example around system strength described later in this submission.

2 | Australia's energy transition and implications for market design

The CEC broadly agrees with the five identified challenges in the issues paper. Renewable energy and storage technologies are an important part of the solution to each of the identified challenges.

We caution that splitting the overall future challenge into five distinct challenges lends itself to an assessment process whereby each challenge is considered in isolation of the others. The post-2025 market design project must keep front of mind the interconnection across the five challenges. Doing so could produce options that address one or more challenges simultaneously. This would also support the principle of simplicity as the project should aim to avoid creating an overly complex future market design.

a) Driving innovation to benefit the consumer

Changing consumer expectations and more active demand-side participation are a feature of the energy transition. The CEC agrees that in light of this, there needs to be consideration of how market design can allow fundamentally different service offerings to emerge that are not currently accessible but may be in the future. This should look to facilitate consumer empowerment while ensuring that consumer protections are preserved. It must also recognise that not all consumers will seek to be active players and so services offerings will need to cater for a range of different consumer types and that the energy transition is complex so we must be mindful of the energy literacy of different types of consumers.

The issues paper lists a number of current market arrangements and reform initiatives but does not mention the extent to which industry itself has and continues to take the initiative to address these matters. For example, the CEC has long recognised that purchasing new technologies such as solar is complex and confusing for consumers. Consumers need help in determining which retailers are committed to fair sales and marketing activities and solar industry best practice. As a result, the CEC established the Approved Solar Retailer program in 2013, which is a voluntary industry code of conduct authorised by the Australian Competition and Consumer Commission (ACCC).[1] This program has over 470 signatories responsible for 51 per cent of the solar installed in Australia over the past year.

In addition, a working group consisting of energy industry bodies and consumer advocate groups has come together to develop a New Energy Technology Consumer Code.[2] This is a code for retailers of products such as solar generation systems, energy storage systems, electrical vehicle charging and other emerging energy products and services. It sets minimum standards of good practice and consumer protection and will apply to all aspects of customers' interactions with participating retailers. This code has been submitted to the ACCC for authorisation and the ACCC is expected to make a final determination on this in October/November 2019.

b) Investment signals to ensure reliability

The single biggest risk to energy reliability in Australia is the lack of new generation investment as our existing generation fleet phases out. Long-term investment-grade policy is necessary to ensure new private investment is made in a timely manner. At the highest level, this requires a long-term integrated federal energy and emissions policy. The Renewable Energy Target (RET) was a highly successful policy that drove significant levels of investment in new utility-scale generation. Now that the RET has been met, the absence of any long-term policy is slowing and distorting the investment

[1] More information is available at: https://www.cleanenergycouncil.org.au/industry/retailers
[2] More information is available at: https://www.accc.gov.au/public-registers/authorisations-and-notifications-registers/authorisations-register/new-energy-tech-consumer-code

decisions required to support a reliable electricity system. Investors are looking to governments to establish stable policy settings that will deliver for the next two to three decades.

The issues paper notes that the post-2025 market design project must contribute to the outcomes of the COAG Energy Council's Strategic Energy Plan. Centred around delivering more affordable energy and satisficed consumers, an outcome of the plan is to deliver reliable and low emissions electricity and gas supply. This points to the importance of low emissions technologies so it is imperative that the ESB provide strong advice around the need for an integrated energy and emissions policy. Australia has an international obligation under the Paris Agreement to reduce emissions to 26-28 per cent on 2005 levels by 2030. It is widely acknowledged that the energy sector has the potential to continue to do the heavy lifting in reducing national emissions, including assisting those other sectors where abatement is both more difficult and expensive. Any national energy and emissions policy must recognise that an unambitious target in the electricity sector sets Australia on a path that risks us falling short of meeting our national target across all sectors. Given this, the assessment of options should also model the emissions outcomes for the electricity sector of the different options.

At a market level, the energy only nature of the NEM is such that it can and does provide signals for new investment, however this can be late and at high cost. The requirement for power station operators to provide notice of closure is useful to provide greater planning visibility and encourage more timely investment behaviour but may not be enough to mitigate the impact of closures on price and reliability. At the same time, it must be acknowledged that as generation ages it becomes less reliable so even with a notice of closure, there are no guarantees of generator availability during this period.

Discussions on reliability must acknowledge this last point around reliability and performance of generators as they near the end of their technical life. In its latest Electricity Statement of Opportunities, AEMO identifies reliability concerns in Victoria for the 2019-20 summer as a result of unplanned outages of two major fossil fuel power stations. The fact that two generators can have such a significant impact on the market balance highlights that an electricity market consisting of large, old and clunky power stations is not suitable for the current energy landscape.

The market framework must aim to incentivise new generation entering the market in place of extending the life of existing generation. To do the latter would only further exacerbate concerns about new generation investability. In light of this, we note that the issues paper focuses on the need for dispatchable generation. The CEC considers the ESB should instead focus on increased flexibility in the market rather than simply increased dispatchability to meet reliability. Flexibility refers to the ability for generation or load to respond to changes in demand and supply in a timely manner. Focusing on flexibility would recognise the important contributions from flexible renewable energy sources, storage technologies such as batteries and pumped hydro, demand side management and Distributed Energy Resources (DER).

Given the NEM is one of a small handful of energy only markets around the world, it is inevitable that the post-2025 market design project will consider capacity mechanisms. An examination of potential capacity mechanisms must first consider whether scarcity prices are capped at too low a level in the current NEM design and if demand response is insufficient to assist in meeting the reliability standard at all times. If these two pre-requisites can be satisfied, it must be recognised that designing and operating capacity mechanisms can be challenging given it requires operators to predict future electricity demand, which has been a historically problematic task, and they are not a tool for resolving problems in wholesale markets so any such problems must also be addressed. Capacity mechanisms can take many forms but the CEC cautions that irrespective of the form, the potential for market distortions, the overall cost of the mechanism to consumers, the implications for innovation and the impact on emission reductions efforts of any potential capacity mechanism must be carefully considered. We note that the issues paper details that the ESB expects to model an energy only market only. To effectively understand any proposed capacity mechanism, this would clearly need to

be expanded to a full model of the capacity mechanism to understand how both markets would work and interact.

The post-2025 market design project must also recognise that key to ensuring reliability is that the right planning and investment frameworks must be in place in order to make sure that new generators have transmission that has been built before they need to connect to it. The transmission network should not be the limiting factor in future generation development. Strategic, coordinated and timely transmission investment will help to deliver affordable and reliable energy to consumers.

c) Integration of DER into the electricity market

Australia has enormous potential in rooftop solar and household batteries as well as other forms of DER such as electricity vehicles and embedded resources in the distribution system. DER solutions will play a critical role in empowering energy customers and supporting a more resilient and distributed energy system that can deliver lower power prices and increased reliability. There has been significant growth in DER such that there are now over two million Australian households with rooftop solar and forecasts suggest further future growth with the Australian Energy Market Commission (AEMC) predicting that more than half of all houses will have solar PV systems and about a third of residential buildings will have energy storage by 2050.[3]

The CEC believes we need to change the way we manage solar and battery systems and how they interact with the grid in order to accelerate the uptake of these solutions. This will require new rules to mandate technological capability and new markets to make best use of the capabilities already at our disposal. We have produced a report, The Distributed Energy Resources Revolution: A Roadmap for Australia's Enormous Rooftop Solar and Battery Potential, which will be helpful for the post-2025 market design project. The report addresses the challenges that Distribution Network Service Providers (DNSPs), regulators, governments and policy makers will face as we make the transition to a DER future and proposes recommendations to facilitate and unlock the enormous potential for DER.[4]

While the issues paper has focused on integration of DER into the electricity market as a challenge, the ESB should be open to the potential ability for DER to address the other four identified challenges.

d) System security and resilience

Maintaining power system security is of utmost importance to efficient market operations. The NEM has several ancillary service markets or mechanisms to support network security, namely Frequency Control Ancillary Services (FCAS), Network Support and Control Ancillary Services, and System Restart Ancillary Services. These are ancillary to the wholesale market so generator revenues from these services are relatively small compared to revenue from electricity sales. Other system security services, such as frequency and inertia, are critical for power system security but not explicitly valued so there is no clear incentive to provide them.

The current ancillary service market was largely designed around the performance and capabilities of gas and coal generation technologies so does not fully utilise the potential range of services operating in the NEM today. There is a need to redesign market frameworks to enable new technologies to participate in ensuring energy security. Renewable energy and storage technologies have the

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[3] AEMC 2019, Energy innovations as solar and batteries approach socket parity, 28 June. Available at: https://www.aemc.gov.au/sites/default/files/2019-06/Energy%20innovations%20as%20solar%20and%20batterie~roach%20socket%20parity%20-FINAL%20MEDIA%20RELEASE%20-%20Embargoed%2012.01am%20Friday%2028%20June2019.PDF

[4] CEC 2019, The Distributed Energy Resources Revolution: A roadmap for Australia's enormous rooftop solar and battery potential. Available at: https://www.cleanenergycouncil.org.au/advocacy-initiatives/energy-transformation/the-distributed-energy-resources-revolution

capability to support power system security. For example, wind turbines are able to provide inertia to the system through sophisticated electronics and control systems that effectively allow rotating blades to provide a boost of power once a fault is directed and batteries are able to provide fast frequency response and inertial response. Given this, the post-2025 market design project must define services in a way that they can be provided by the largest range of providers. Future system security service arrangements must also be flexible and adaptable to future technological developments and promote innovation. Speed and accuracy performance must also be valued in addition to capability.

The value from system security services are vital for utility-scale battery development given current arrangements mean revenue generation is largely through the FCAS markets rather than energy arbitrage in the wholesale market. However, it is must be noted that that while this may be the case, battery storage is currently not receiving the full value of its response given the absence of a fast frequency response market. Battery storage is a critical element in Australia's future energy mix and while it can deliver a suite of services across a range of timescales, these are not currently monetised.

The CEC supports market-based solutions to value system security services to manage the power system, but it must be recognised that market-based arrangements may not be appropriate to deliver all these services in the most efficient way and to the greatest net benefit to the market. Assessing the value of potential markets must consider the risk tolerances around these services and whether there would be sufficient liquidity in the market to deliver sufficient levels of a given service. Such an assessment may make it clear that it may be more efficient for a service to be delivered through a mandatory requirement at the NSP level. For example, under the current requirements around system strength and 'do no harm', connecting generators are increasingly being required to build synchronous condensers for the purposes of system strength remediation. This is resulting in multiple synchronous condensers being built by multiple connecting generators, which in turn is leading to a degree of overbuild. This is not an efficient market outcome. A more efficient solution would be to build one larger synchronous condenser, perhaps owned by the TNSP, from which services should be shared between multiple generators. This could take the form of a regulated service whereby system strength is effectively managed by the TNSP therefore allowing generators to quickly and easily connect without having to consider system strength requirements, or a commercial service whereby generators could contract with the TNSP to meet their system strength requirement.

This links to a current difficulty in relation to services around split responsibilities across different parties in the NEM. In the example of system strength, AEMO is responsible for identifying and declaring gaps and TNSPs are then responsible for responding with appropriate measures to provide for the minimum level of system strength necessary to maintain the power system in a secure operating state. At the same time, new connecting generators are required to do no harm to the level of system strength necessary to maintain the security of the power system. It is appropriate that the post-2025 market design project consider which parties are best placed to undertake the different responsibilities and how this connects into efficient market and power system outcomes.

In considering the range of system security services, it is easy to see these leading to the introduction of a number of new markets. The CEC cautions against a proliferation of service markets as with each market comes cost and as more and more markets are developed, the marginal value of each is likely to decrease while the cost of set up and continued operation increases. For example, we can point to the UK experience where there are a substantial number of balancing services and products and National Grid has undergone a process of rationalising these. In addition, a proliferation of service markets creates a more complex environment that could perversely dissuade investment as it could be difficult to factor these into a new generator's business case.

e) Integration of variable renewable energy into the power system

The issues paper splits this matter into two matters: access and coordination of investment, and operations. In relation to the former, the ESB points to the AEMC's Coordination of Generation and Transmission Investment (COGATI) work program and notes that the post-2025 market design project

will be consistent with the COGATI review and look to build upon the proposals. This appears to be a pragmatic approach and highlights that such a complex reform must not be rushed. Sufficient time must be allowed to develop and test the detailed design and then implement it. In relation to the latter, the CEC supports considering the appropriate method of dispatching energy resources into the transmission network, but this must consider what new approaches to market operations would mean for different types of plant.

The integration of renewable energy challenge should also consider the connections process for utility-scale generators. New generators are regularly reporting that connection issues are leading to increased costs and delays to renewable energy developments. Often cited reasons for this include:

- Inconsistent interpretations of the process, particularly relating to generator technical performance standards, by different NSPs and AEMO
- Complex and opaque modelling requirements
- Resourcing issues for NSPs and consultants that assist developers with the connection process, generator technical performance standard negotiations
- Last-minute requirements for system strength remediation impacting developers' ability to energise.

This is an area that the CEC and its members have been examining for some time, including engaging a consultant to survey different parties involved in the connections process to better understand connections experiences, draw out common problem areas or themes across the process and provide recommendations to improve the process. We would be happy to share this work with the ESB.