

30 September 2019

Ms Kerry Schott, Chair
Energy Security Board
CoAG Energy Council Secretariat
GPO Box 787
CANBERRA ACT 2601

By email: Kerry.Schott@esb.org.au
Cc: info@esb.org.au

Dear Ms Schott

Re: Energy Security Board Post 2025 Market Design – Issues Paper

GreenSync welcomes the opportunity to provide comments in response to the ESB's post 2025 market design project and recent issues paper.

We appreciate the role that the ESB is playing to set direction for the current and future transition of the Australian energy system. We also value the ESB's strong interest in technologies and their roles in our markets leading up to and beyond 2025.

GreenSync has participated in stakeholder forums and sessions to provide insights and experience to the ESB project team. In addition to views provided those sessions, we are providing specific comments on the role that distributed energy resources play in relation to four of the five challenges material to market design in 2025:

- Investment signals to ensure reliability
- Integration of DER into the electricity system
- Provision of system ancillary security services and system resilience
- Other barriers to investment

We also attached two recently developed papers that will provide input to your thinking:

- **Navigating standards and frameworks for distributed energy resources** – What standards fit where & the four steps to flexible markets for DER
- **Application and deployment of Dynamic Connection Agreements for distributed energy resources**

About GreenSync

GreenSync is an Australian energy-tech company that develops software solutions to connect millions of distributed energy resources (DER) and create more dynamic grids. Our technology, led by the deX platform, enables flexible and decentralised electricity grids via new marketplaces for



GreenSync Pty Ltd
info@greensync.com
<https://greensync.com>
ABN : 68 141 586 003

decentralised energy. By connecting decentralised energy resources, more resilient, efficient and sustainable energy networks can operate. Our market-enabling technology offers capability and efficiency for today's virtual power plants and tomorrow's transactive energy systems. Our approach aims to:

- Drive appropriate investment in infrastructure and encourage energy trading and sharing
- Empower households and businesses to participate in energy exchanges to derive best value from decentralised assets
- Improve the sustainability of our energy systems without compromising security or reliability.

To date, over 100 organisations across 20 countries have partnered with GreenSync and deX, including major utilities, leading technology brands and industry bodies. In Australia we have active participation from key networks and retailers, AEMO and State and Federal agencies. In addition, we have extensive support from DER technology vendors and technical integrations completed or scheduled with major DER hardware vendors and VPP aggregation platforms.

About deX

GreenSync's Decentralised Energy Exchange (deX) is a digital platform that allows electricity market/system operators and networks to gain visibility and better coordinate the increasing volume of individual DER and aggregated fleets in the electricity grid, while helping consumers get more value from these assets. It provides an open exchange through which retailers and aggregators can recruit DER to VPP offers and enable service contracts to be published by system, and network operators. deX provides the capability to enable three key outcomes:

1. Streamline and simplify customer DER asset connection, registration and compliance
2. Increase distribution network (near) real-time visibility and coordination of individual DER and aggregated DER activity in virtual power plants
3. Unlock customer value and choice by enabling VPP interoperability in the national electricity market and in local flexibility markets

GreenSync is working across Australian and international jurisdictions in delivering deX technology and software integrations, asset registration, customer consent, dynamic asset control for network operational requirements and for participation in service markets such as FCAS, energy supply, storage and demand response.

Energy Security Board Post 2025 Market Design - comments

At a high level, GreenSync considers that our national electricity market is not broken, but in need of renovation. The renovation project needs to orient the market to survive and thrive with increased behind-the-meter capacity, demand side participation and majority renewable and distributed energy technology-based grids.

Today there are barriers for participation by DER through rules, regulations and technical hurdles. There are also barriers for procurement of services by other parties (including networks) through rules, regulations, restrictions and technical requirements.

Our view on how to modify or change these present barriers are, as far as possible, to ensure that requirements are outcomes focussed, enabling any capable technology and service provider to deliver against the outcomes.

Further comments are made below in relation to distributed energy resource (DER) interaction and provision of services to energy markets in line with the ESB's recent round of stakeholder workshops.

Investment signals to ensure reliability

DER have the potential to support investment signals through inherent digital smarts that could be leveraged by Australia's energy market design. The role that DER can play in relation to investment signals to ensure reliability include:

- Provision of data services to inform more granular, locationally accurate forecasts and planning for infrastructure and market operations
- Provision of energy services to wholesale market participants to support balancing and 'reliability' obligations, demand response and (potentially) emergency reserves; reducing the absolute requirement for other utility-scale capacity and storage assets to be built.
- Provision of resource services to network and system operators to provide locationally valuable voltage/frequency support; providing services to support reliability, data about that service provision and an evidence base to underpin granular network investment business cases.

Integration of DER into the electricity system

The integration of DER into the electricity system is underway today. Over the next couple of years, technology vendors like GreenSync and others will have largely solved technical challenges to DER integration with other (existing) systems in the electricity ecosystem.

We appreciate that legacy DER which will have no digital links to the wider electricity system will remain in our grid for some decades to come. However, we know that most new DER technologies can be connected and made visible to other systems via internet connectivity, cloud-to-cloud communications systems and software platforms.

At scale, using technology available and emerging today, DER can be managed collectively to optimise costs and capacity at an aggregated level through software platforms and tools. But, aggregation that optimises a fleet may not correlate to the best physical outcome for the distribution grid or wider system. Clearly, there is a role for better coordination, overall.

In order to get to a point of system-level coordination, we need a place to start and iterative steps to move forward. In our view, there are four-steps to build up to that system-level coordination of DER:

- Sensible autonomous behaviour of DER
- Connectivity and visibility of DER
- Remote control of DER
- Flexible markets for DER services

These steps are articulated in more detail in the attached paper on **Standards & Frameworks for DER**. These steps underpin our experience in developing the Decentralised Energy Exchange (deX) whereby the potential for service contracting and markets for DER flexibility services can form a key pathway for, and drive workable integration of, DER in the energy system.

This approach enables rapid change and evolution for software APIs while leveraging hardware behaviour and connectivity, set and defined by DER standards. That said, it is important to recognise there is no one standard to rule them all. As such, the role for middleware that can act as an adapter between standards, and vendor specific APIs is a crucial element to enable integrations between systems today, and standards as they emerge.

In our view the technical integration is solvable, and is being solved, by hardware and software solution providers working in collaboration with retailers, aggregators, networks, market operators. We recommend that the ESB focus on enabling participation and provision of services from DER, as a way to drive the intended outcome: increased integration of DER in the energy system and markets.

Provision of system security (ancillary) services and system resilience

System security (ancillary) services are used by AEMO to ensure the secure and reliable operation of the NEM. Irrespective of how a market may be designed to achieve the desired outcomes, there needs to be some mechanism for AEMO to achieve an appropriate combination of generation dispatch to ensure the secure and reliable operation of the power system.

Under a market-based approach, competition in the provision of ancillary services should be encouraged, while ensuring that market participants meet all technical requirements. GreenSync considers that part of the ESB's work on the post 2025 should focus on reducing the barriers to entry for third parties to participate in ancillary service markets. This would drive innovative approaches for the provision of these services.

We note that the wholesale demand response mechanism will begin with substantial restrictions on what and who can provide services. While (seemingly) outside of the ESB's present consultation, it seems prudent to suggest that a role for practical demonstrations to inform market evolution would assist in enabling regulatory and market oversight to be more agile and responsive.

As the installation of customer DER continues to accelerate, customers in many instances are installing assets that have the capability to provide certain ancillary services. In this context, we would like to see the ESB's work ensure there is a mechanism to allow for these assets to provide these services. In our view, consideration needs to be given to:

- How these services may be provided on behalf of the customer by a third-party aggregator or VPP operator?
- How to provide clear signals on the value of these capabilities to the operation of the power system and to drive further innovation by technology vendors?
- The overall efficiency that can be achieved by utilisation of existing assets that can support the system and market, and if there is an incentive and pathway to do this?

In addition to the existing transmission network level ancillary services, consideration should be given to the role of services in the management of the distribution network. While today localised network performance issues are largely addressed through network augmentation, there is an opportunity for procurement of DER services to defer or avoid network investment. As the penetration of DER in the distribution network continues to increase, so too does the availability of these assets to provide services to distribution networks, at the location and time required by the network. However, there is currently no framework around how services might be procured in the distribution network.

GreenSync recommends that as part of the ESB's work on the post-2025 market design, the role of service procurement in distribution network management should be considered. We would urge the ESB to consider:

- How the procurement of services by networks from DER can drive overall efficiency (eg. by allowing asset owners to receive additional value from their assets, while driving the deferral or avoidance of network investment)?
- How to ensure that the outcomes are fair, consistent, and in alignment with customer expectations (eg. by beginning to define an approach/framework for how distribution networks procure services from third parties)?

Other barriers to investment/opportunities for DER

As consumers continue to invest in DER, there is a growing opportunity to encourage (via incentive programs or opt-in) basic communication functionality between the DER asset, network and market operator. Without this basic capability being established in the near-term, the ability for future service provision and participation in markets becomes far harder.

GreenSync strongly considers that basic asset registration and dynamic visibility are key to better planning and management of the energy system and the development of flexibility markets. In our view, beyond registration and basic communication, opportunities for DER to provide flexible services will be enabled by:

- Mechanisms for tendering and bidding (requesting and offering) services
- Definition of DER service products - data or energy related
- Supporting services evolving, such as settlement, and impartial baselining

Summary of recommendations/key messages

Between now and 2025 (and beyond), the ongoing transition in generation investment at all scales will continue, regardless of any modification to the energy market. Behind the meter investment will continue and underpin a growing cohort of prosumers owning solar PV, battery storage, electric vehicles, smart pool pumps, smart water systems. This trend is happening at a rate, in Australia, that is unmatched in other countries.

As such, facilitation and management of ongoing grid-connection of DER in the short to medium term will be a key challenge for Australia's grids leading up to 2025. The impact on voltage, thermal limits, frequency control and inertia create challenges for both network and system security and

reliability. The total installed capacity behind the meter will also create opportunities for efficient energy services to the wholesale market.

The post-2025 market design needs to evolve to meet the technology capabilities and draw on these for both system and market requirements. While we don't underestimate the ESB's task here, it is the only prudent option. We cannot wait until 2025 to start. There are actions required over the next five years that will need to be implemented to underpin a resilient post 2025 market design that delivers for consumers and system operations.

We consider that the Australian energy market and its operations can be oriented to enable and leverage the capabilities of distributed energy resources. To accelerate along this path and drive towards markets for DER services by 2025 requires basic steps to be taken in the near-term.

DER participation in the post-2025 market can be enabled by:

- Identifying and encouraging cross-industry collaboration to, rationally, build up to system-level coordination of DER, beginning with sensible autonomous behaviour of DER and connectivity for visibility of DER.
- Ensuring existing and new market mechanisms allow for DER to provide services.
- Identifying opportunities for DER to provide flexible services and the key enabling elements required between now and 2025:
- Identifying how to enable procurement of services from DER assets at the distribution level.

For queries in relation to our comments or the attached paper, please contact Bridget Ryan on 0402 115 589 or bridget.ryan@greensync.com.

Yours sincerely,

Bridget Ryan

Policy and Government Lead