GREENSYNC

Nathan Petrus

Director Consumer Protection and Pricing

Essential Services Commission

GPO Box 2605

ADELAIDE SA 5001

18 August 2017

Dear Mr Petrus

RE: Inquiry into the reliability and quality of electricity supply on the Eyre Peninsula

We welcome the opportunity to provide this response to the Essential Services Commission South Australia (ESCOSA) inquiry into the reliability and quality of electricity supply on the Eyre Peninsula.

GreenSync is a technology company that is part of a new generation of energy innovators using smart software control to optimise the use of distributed energy resources (DERs) in electricity grids. We provide network support to the country's largest utilities, deliver demand charge reductions and physical hedging of spot market exposure for commercial & industrial customers and optimise microgrids to maximise the efficient use of energy resources. We have been successful in attracting federal and state government grants. We have been awarded the largest Regulatory Investment Test for Distribution (RIT-D) project for a non-network provider to date, and work collaboratively with a range of organisations within the energy industry to drive the transformation of our energy system.

We are focused on building the technology to support an integrated, reliable, sustainable and affordable electricity grid.

GreenSync creates technology for behind-the-meter resources such as discretionary loads, backup generators, solar power and battery storage so they can be best utilised through the electricity value chain. This enables resource owners to monetise their existing assets or build stronger business cases for deploying new assets. This technology enables system operators, retailers and networks to utilise previously hidden, uneconomic or unreliable individual DERs. This is provided as an aggregated portfolio that is reliable, economic and visible.

We believe that the technology available today can help Australia build a more affordable, reliable and cleaner energy system within the next 5 to 10 years. If we work together as an industry, this technology driven transformation could see real price decreases for end consumers.

This inquiry provides an opportunity for ESCOSA to establish a framework for delivering the levels of reliability desired by electricity customers on the Eyre Peninsula which uses a mix of network and non-network technology.

To strike the right balance between network and non-network solutions we need more information than is currently provided. In this submission we identify some of the information requirements that could support how we, and other DER providers, can deliver more targeted proposals to the Regulatory Investment Test processes conducted by ElectraNet and SAPN.

Further, we would like the optionality of DER projects to be considered more explicitly in those RIT assessments. In a world which is characterised by declining costs, rapidly evolving technology and competing policy objectives, valuing the optionality of projects is even more important. It ensures that customers are not left paying for assets in 30 years' time which are no longer required.

In this submission, we also highlight how our technology works and where it has been deployed which demonstrates that it could be used to deliver reliable and affordable outcomes for electricity customers on the Eyre Peninsula.

## deX

Our Distributed Energy Exchange (deX) is designed to bring together a wide variety of participants including residential consumers, commercial and industrial consumers, aggregators, energy services companies, technology providers, network operators, retailers and regulatory agencies.

The deX will contain a series of information layers that provide exchange participants with much of the information required for efficient distributed energy resources (DER) investment decision-making, DER service contract design and secure power system management. Information provided by the deX will include a base set of solutions with capacity to grow to meet needs and match market capabilities over time:

- Network information (e.g. network load forecasts, network constraints, network element hosting capacity, existing DER locations, contracted services, operation and capabilities);
- Contract information for existing and offered contracts (e.g. services required, service level agreements, network statements of opportunities);
- Real-time status and dispatch data for each DER to verify and settle services provided under contract; and
- System security management rules to limit DER dispatch impacts on network security (e.g. acceptable recharge times for batteries, response to voltage control issues, contract conflict management systems design).

It offers a set of capabilities to attract users to the deX, from providing the information required for efficient price discovery, to tools for the trade and dispatch of distributed energy services. The deX will also allow DER asset owners and aggregators to enter into multiple contracts with more than one buyer for their DER services, which will minimise the influence of large buyers in the market.

The deX offers an open API to allow developers to bring new products and services to the deX market. The deX is designed to create a multisided market that will build on positive network effects—increasing scale generates more value, which attracts more members, which creates more value—to drive market thickness. These positive network effects also increase the value of deX participation for early adopters as a growing number of DERs enrolled in the deX expands the range of services DER owners can be paid for.

The deX's data-driven matching service will facilitate coordination between exchange participants to optimise investment in and dispatch of distributed energy. By this process, the exchange will capture the benefits created by granular differences in the place and time of dispatch of distributed energy resources.

The small scale of individual DERs relative to the power system as a whole means they are often best aggregated and coordinated. The deX will provide ongoing data about DER responses to dispatch signals, allowing aggregators to ensure the failure of any subset of assets does not affect their ability to reliably deliver contracted services.

The deX will coordinate the advance commitment of DERs through a day-ahead dispatch planning and review system within boundaries set by the Distribution Network Service Provider (DNSP); or, as distribution markets evolve, a distribution system operator (DSO). The DNSP will be able to monitor and manage the impacts of DER dispatch on system security through continuous review of dispatch plans against system technical capabilities up until a final gate-closure period, before physical dispatch.

## Mornington Peninsula

One example of where our technology has been deployed is on Victoria's Mornington Peninsula. GreenSync has entered into a partnership with Victorian utility United Energy (UE) to deliver a demand response and energy storage project. [1]

The project will defer the need for capital investment on the lower Mornington Peninsula by managing periods of peak demand.

UE has been actively looking for cost competitive alternatives to traditional network augmentation, which it has found in GreenSync's solution.

Over the next five years, GreenSync will engage and incentivise households, small businesses and community organisations on the lower Mornington Peninsula (from Rosebud to Portsea) to help them reduce and/or shift their electricity usage voluntarily or through the use of solar PV and energy storage systems. As part of this project GreenSync is engaging with local utilities and other larger Commercial and Industrial operations to control their discretionary loads.

The non-network demand response initiative will allow UE to delay having to build new infrastructure to meet infrequent high demand in the area, typically over the summer holiday period.

## Information is key

Central to the delivering the outcomes required is improved information sharing to enable non-network providers, such as ourselves, to deliver reliable and affordable outcomes.

The Independent Review into the Future Security of the National Electricity Market identified some of these challenges:

[1] https://www.unitedenergy.com.au/wp-content/uploads/2015/09/Lower-Mornington-Peninsula-Supply-Area-RIT-D-Final-Project-Assessment-Report.pdf

- There is a lack of transparency of information about electricity prices and consumer bills; Existing arrangements for sharing electricity consumption data are not effective. Consumers struggle to access their own consumption data in an effective way and to be able to share it with service providers;
- A lack of visibility of DER, including what is installed and how it is operating, is challenging AEMO's ability to manage power system security; and
- A recognised gap in data used for NEM forecasting and planning is the limited information on energy consumption and the changing drivers of energy demand. For instance, as a result of current net-settlement arrangements between retailers, no single entity (including AEMO) has access to a complete set of energy consumption data[2].

While there have been good strides made towards improving information transparency at the lower voltage levels, such as through the Distribution Annual Planning Report template[3], further information is required on the following network challenges:

- Voltage;
- Frequency;
- Harmonics;
- Flicker; and
- Power factors.

AEMO has also identified some potential information challenges with managing a centralised power system. Some of the information gaps identified by AEMO include:

- Trip settings;
- Modes of operation;
- Device part of aggregated control;
- Performance derating;
- PV and Battery Manufacturer, make and model number; and
- PV and Battery Installation date and decommissioning date.

We encourage ESCOSA to consider how it could impose licence conditions which compels the network businesses to release this information.

## Consider the inherent optionality of DER

To obtain the full benefits from DER its optionality needs to be explicitly valued. Real options is a method for valuing the inherent flexibility of investments delivered through most DER solutions. Unlike the more commonly used discounted cash flow net present value (NPV) approach it is better suited to valuing staged projects with irreversible investment decisions where there is substantial uncertainty.

Valuations generated using a real options model may diverge significantly from an NPV approach – in cases where future investment flexibility is valuable. Because the standard NPV approach uses the unconditional expectation of future cash flows, it cannot capture contingent events and investment flexibility, such as future investment or divestment decisions made in response to changing circumstances.

They are also particularly useful when it is necessary to incorporate uncertainty surrounding the future impact of renewable technologies, policy changes, or technological advancements on power infrastructure planning.

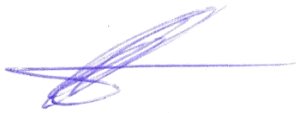
Real options models can be implemented using a variety of approaches: some simple scenarios allow a closed form mathematical solution, while more complicated scenarios require Monte-Carlo simulations, decision trees.

However, to date they have rarely been used by network businesses. This risks over investment in network infrastructure which might be redundant in 10 years time.

We would welcome ESCOSA imposing a requirement for these to be explicitly considered in investment decision making on the Eyre Peninsula.

We would welcome an opportunity to meet with ESCOSA to provide an overview of the deX and to discuss the future direction of DER and how it can be used on the Eyre Peninsula. If you have any questions about anything we have raised in this submission please do not hesitate to contact me on 0406 677 162.

Yours Sincerely



Matthew A. Coleman

General Manager Network Services