



15 November 2021

Energy Policy WA
Locked Bag 11, Cloisters Square, WA 6850

Submitted by email to: submissions@energy.wa.gov.au

Dear Sir/Madam,

Re: Low Load Responses – Distributed Photovoltaic Generation Management Discussion Paper

SA Power Networks welcomes the opportunity to provide a submission to the above Discussion Paper relating to the management of low levels of operational demand in the SWIS associated with the high uptake of distributed rooftop photovoltaic (PV) generation.

South Australia has the world's highest penetration of rooftop solar, and the State's electricity system is facing very similar challenges to the SWIS in managing the impact of very high levels of distributed solar PV relative to underlying load. Minimum operational demand for the state reached a new record low of 188 MW in the middle of the day on 31 October this year and may reach zero as early as next year. At times of extremely low operational demand, net load on the distribution network is now negative; at these times, the only demand not met by solar comes from the state's large industrial loads connected at the transmission network, and the entire distribution network is a net generator.

As South Australia's distribution network operator, SA Power Networks has been working actively over several years with AEMO, the South Australian Government, SA's transmission company ElectraNet, the solar industry and South Australian customers to develop solutions to the technical challenges arising from periods of extremely low demand, and the transition to distributed energy more generally. Our response to the EPWA's discussion paper is informed by our experience in this area.

Means to meet the requirements

We agree with the proposal by EPWA to take an outcome focussed, 'technology agnostic' approach to meeting the requirements for DPV management, via the "approved methods for DPV Management". We believe this encourages innovation and competition, provides greater customer choice, and avoids forcing solutions in instances where they may not be practical.

Consideration should be given to offering exemptions for customers who are willing to adopt a fixed 0kW export limit. In practise, the number of customers selecting this option are likely to be low based on the SA experience, however it provides choice and an option for customers who cannot access the internet and/or are opposed to smart meter installations.

As we transition to implementing dynamic export limits in South Australia under our [Flexible Exports](#) connection option, customers will have access to even greater levels of network access. Our standard export limit is currently 5kW per phase, soon to reduce to 1.5kW, but Flexible Exports will offer up to 10kW, approximately 98% of the time. Customers choosing the flexible option benefit from significant additional value from their systems. We believe this will support the transition to 'smart' energy resources and help build social license.

Considering the holistic, long term solution

There are three related, but quite separate, circumstances in which it may be necessary or desirable to curtail the output of a customer's rooftop PV system:

1. To manage distribution network capacity constraints
2. To manage system security risks
3. To respond to a market price signal, e.g. a negative wholesale energy price

Modelling completed as part of our most recent regulatory determination demonstrated that implementing dynamic operating envelopes for DER integration was by far the most efficient option to enable the continued transition to distributed energy, and essential for progressing beyond current levels of solar PV penetration (1). In South Australia, we are on track to achieve this by implementing our Flexible Exports connection option for new and upgrading solar and VPPs in 2022, leveraging the IEEE2030.5 communications standard.

As the DNSP, we also play a critical role in managing distributed generation in order to manage system security risks under the direction of AEMO (2). We have a variety of mechanisms at our disposal to achieve this including SCADA control of large generators, simple remote disconnection, Enhanced Voltage Management (raising network voltages) and shortly, dynamic export limits (Flexible Exports). In time we expect to rely on Flexible Exports as the primary means to manage minimum demand for system security events, on top of daily distribution constraint management.

We need backstops to protect the system from the risk of catastrophic failure when it is operating outside of its normal range and the market has insufficient power to get supply and demand back into balance. The more we can improve the power of the market the less likely it is we will need to call upon backstop interventions.

An issue in SA is that rooftop solar as the state's largest generator is operating outside the wholesale market, and we are regularly seeing periods where there is too much supply. The market is trying to correct with negative prices, but rooftop PV is unable to respond and keeps generating at full power.

We are starting to see retailers look to ways to curtail customers' PV at these times. Smart inverters and standards like 2030.5 make this possible, but it's important to note that turning down inverters by customers, retailers or aggregators in response to price signals is a quite separate activity that can and will co-exist in the long term with the setting of export limits by DNSPs (1) and occasional emergency generation shedding events (2).

The interface for dynamic operating envelopes can provide the solution to (1), (2) and (3) above. On the other hand, we note that a significant disadvantage of a DPV management scheme based on simple remote disconnection of the solar inverter is that it does not allow for the level of control required to respond effectively to distribution constraints (1) or market price signals (3).

We encourage EPWA to consider the longer-term solution beyond the initial stop gap remote disconnection and provide additional clarity on longer term policy direction so that it can be considered by the industry as part of implementation.

The importance of national consistency

On a global scale, states in Australia represent a small market. However, they are strategically important as models for high DER network across the world. Nonetheless, it can be challenging to stimulate the required development activities in technology providers to support the advanced use

cases required for DPV management, particularly given concerns around technology dead ends and bespoke approaches across each jurisdiction.

Therefore, for the benefit of DPV management in each state, we believe it is important to align on approaches and to clearly signal this to industry. Short term, this might look like SA Power Networks and Synergy agreeing on a basic API over which communications to technology providers platforms for bulk inverter disconnection orders can take place.

In the longer term, we believe this means transitioning to dynamic export limits facilitated by the Australian Common Smart Inverter Profile (CSIP-AUS) for implementation of IEEE2030.5, as developed by the DER API Technical Working Group and overseen by the DEIP Interoperability Steering Committee.

This capability will be required for all exporting inverters in South Australia from July 2022, as defined by the SA Government's 'Smarter Homes' regulations. We believe this will provide an opportunity for other jurisdictions to leverage SA Power Networks' connection process, the IEEE Utility Server, the guidelines developed by the Office of the Technical Regulator, supporting collateral for the solar industry and a suite of inverters compatible with CSIP-AUS 'out of the box' to streamline implementation.

We strongly recommend that WA should seek to follow the national approach with IEEE2030.5 as defined in CSIP-AUS, which

- Allows for all use cases, notably dynamic export limiting for managing distribution network capacity, not just occasional generation shedding
- Allows for customers to install equipment that is directly compatible with the scheme, rather than have to have an agent. This may make no difference initially, but recognising that the agent role is optional in the longer term may facilitate the future transition to retail competition in WA
- Allows a common approach nationally, which will facilitate an easier transition and encourage technology providers to develop compatible products

Clarifying roles and responsibilities

We note that the proposed model in which Synergy acts as an 'authorised agent' to convey DPV management signals from Western Power to the customer's DER is consistent with the market arrangements in WA in which the customer has no direct contractual relationship with the DNSP.

In South Australia and other states that operate under the NECF, the technical aspects of a small customer's connection and use of embedded generation are governed by the terms of their regulated connection agreement with the DNSP. This means that customers do not need an 'authorised agent' to participate in DPV management; they have a direct obligation under their connection agreement to operate their DER within the DNSP's dynamic export limit, and they can achieve this simply by installing an inverter that complies to the CSIP-AUS, which will connect to the DNSP's IEEE2030.5 utility Server and follow the limits published for its NMI.

This does not preclude a customer appointing a third-party retailer or aggregator to act as their agent and control their DER if they choose to do so.

"Synergy would be responsible for triggering the capability within its DPV customer portfolio. Synergy would have flexibility to implement a technical solution (within those approved by Western Power) that meets its needs and those of its customers."

We note that this would need to be done in a manner that is cognisant of the physical constraints in the distribution network, and other mechanisms that Western Power may be deploying in parallel in response to the system security event. Hence, we would recommend against making the retailer responsible for choosing which customers to activate the response for as it may not have sufficient information on the dynamic state of the network to do this effectively. It would be more appropriate for Western Power to choose which customers to activate as part of a coordinated response, with the role of the retailer or agent limited to ensuring the signal is passed through and actioned at each customer site. This is how the agent role works in SA. This limits any new legal obligations on the retailer to things within its control.

It is important to recognise the very important role of the solar retailers and their installers in the sale, commissioning and on-going support of the remote disconnection technology. The roles and responsibilities of the solar industry are largely unchanged, however the transition to 'smart' DER requires a significant uplift in capabilities that cannot be underestimated. Early and ongoing engagement with solar retailers and installers is critical for successful implementation.

There is a risk, as has occurred in the agent implementation in South Australia, that the roles and responsibilities between the agent, technology solution provider and the solar retailer/installer are not clear. We strongly encourage EPWA to consider the most appropriate framework for implementation, which should consider the logical roles of each party, and aligning appropriate incentives and obligations. This should be integrated as part of the changes to regulations, clearly communicated to all parties and overseen by an operational governance framework.

Timeframe

Consideration should be given to striking the right balance between speed of implementation and ensuring the solutions deployed are technically sound and able to be supported by the industry. Our experience in South Australia would likely have benefited from more time spent developing capabilities within the solar industry, clear roles and responsibilities and an approach for compliance management.

Please refer to the attachment for responses to specific questions within the consultation paper.

If you wish to discuss any aspect of our submission, please contact Brendon Hampton, Manager Network Strategy, on 0418 362 267.

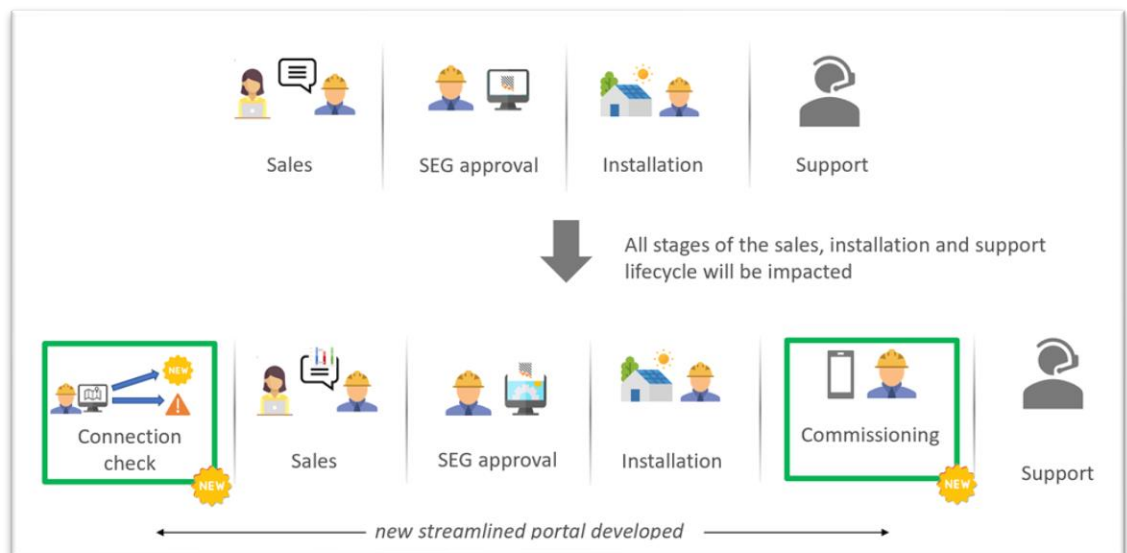
Yours sincerely,

Mark Vincent
GENERAL MANAGER STRATEGY AND TRANSFORMATION

ATTACHMENT 1 – FURTHER DETAILS

- a) **Are there any practical considerations Energy Policy WA should have regard for in implementing the proposed DPV Management model?**
- Relevant comments have been provided in the body of our response
- b) **What mechanisms should be used to provide information to consumers about DPV Management events and what form should this information take?**
- Emergency curtailment events are rare. We have pre-prepared materials that are available for release on various communication channels in the event that DPV is curtailed for system security purposes. AEMO is typically the initiator of the disconnection direction and takes the lead with the media.
 - It is just as important that this information reaches the solar industry, as from our experience, they will usually be the party which receives the customer query regarding the disconnection/"failure" of their solar system.
 - It is important to explain, in simple terms, why such events were necessary and what they have prevented i.e. state-wide blackout.
 - Importantly the SA Government, AEMO and SA Power Networks have engaged in some coordinated proactive media messaging to explain the need for DPV management in emergency circumstances and what it will prevent.
 - In time, particularly as we transition to dynamic operating envelopes, we expect that relevant information on curtailment will be built into the customer portal/apps of the technology provider (aggregator, HEMS or inverter OEM).
- c) **What sort of customer support information should be made available by Synergy to assist customers to maintain compliance with remote communication – for example, if a Wi-Fi connection needs to be re-established?**
- It would be appropriate for the technology providers and/or Synergy to send an automated message to the customer advising that this has occurred and providing steps to resolve the issue. SA Power Networks intends to establish this capability to support the implementation of our 'Flexible Exports' connection service.
 - Ideally the technical requirements for the site would include a fail-safe, that will ensure that generation is reduced to a safe level should the internet connection fail. This is the case for any inverter operating on dynamic operating envelopes under CSIP-AUS 2030.5. This provides a financial incentive for the customer to have the issue rectified, while also providing a technical backstop if they don't.
- d) **What assistance or training might be provided for installers to help meet requirements for validation, at the point of installation, and on an ongoing basis?**
- It is important that technology providers provide high quality information to help installers set up their equipment such that it will be able to be curtailed by Synergy. This information must be readily accessible on-site.

- Technology providers need to offer relevant training and support (i.e. support line) for installers.
- Issues such as validating the location of the DER will also be important, to ensure the plant is located within the WP network and subject to disconnection requirements.
- To support the transition to 'smart DER' SA Power Networks has recently launched a new small embedded generation connections portal. This tracks the connections process end-end, and captures the critical new steps of:
 - i. Selecting the appropriate technology solution and export limits for the site
 - ii. Providing a means for the installer to 'close out' the installation at the time of commissioning and provide important information that will ensure the site is able to be matched with systems available for control under technology providers' platforms



- The rules built into the portal are aware of the SA Government's Smarter Homes regulations and valid technology solutions, enabling 100% of applications to be pre-validated and auto approved
- The portal provides links to the necessary support information to commission the equipment, which are accessible to both solar retailer and installer
- The portal also provides a much-needed capability to track and enforce compliance
- As we move to implement Flexible Exports in 2022, we will integrate the commissioning of the IEEE2030.5 interface into the portal, such that the installer will receive a 'green tick' when the system is online and ready to receive dynamic operating envelopes. This will enable the installer to be confident that the site is working and they have met their obligations
- We're also in the process of integrating smart meter data feeds which will be used to automatically check for new/upgraded sites without approval and checking compliance with specified export limits.

e) Energy Policy WA will assist customers and installers in providing fact sheets and other communication tools to support the changes. Do you have any suggestions for information that you would like included within these fact sheets?

- The long term vision and how the proposed reforms fit into the broader landscape of solutions to achieve the best overall customer outcomes
- It will be important to clarify roles and responsibilities of each party, and the expected processes
- Refer to South Australia’s Office of the Technical Regulator for examples of facts sheets provided for the implantation of the similar “Smarter Homes” reforms in SA. These could certainly be enhanced, particularly with current experience, however they provide a reasonable starting point:

https://www.energymining.sa.gov.au/energy_and_technical_regulation/energy_supply/regulatory_changes_for_smarter_homes

f) Do you have any other questions, or comments?

- We are very happy to contribute to on-going collaboration between WA and SA in the implementation of DPV management and the energy transition more generally