



Government
of South Australia

Department for
Energy and Mining

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Consultation on the Proposed Export Limit Requirements for Distributed Solar Generating Plants in South Australia

Glossary

AEMO	The Australian Energy Market Operator
DER	Distributed Energy Resources
DNSP	Distribution Network Service Provider
IES	Inverter Energy Systems
ISP	Integrated System Plan
PV	Photovoltaic
SAPN	SA Power Networks

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1. Background

To the Australian Energy Market Operator's (AEMO's) knowledge, South Australia is the first gigawatt scale power system in the world to approach operation with such a high proportion of demand met by distributed energy resources (DER), such as solar generation on homes and businesses.

In AEMO's latest *South Australian Electricity Report*, for 2018-19, rooftop photovoltaic (PV) accounted for 9.5% of South Australia's energy, generating 1,374 GWh of electricity. This was an increase from 2017-18, which was 1,162 GWh of electricity generated from rooftop PV. This increase was the result of an additional 151 MW of rooftop PV being installed in 2018-19 across both business and residential sectors.

Looking forward, in the Draft 2019-20 Integrated System Plan (ISP), there is a significant difference between the two ISP scenarios for South Australia:

- The Central scenario shows rooftop PV growth slowing and plateauing in the near future, reaching total installed capacity of around 1,400 MW by 2024-25.
- In contrast, the High DER scenario shows a short-term acceleration in rooftop PV growth, followed by continued growth similar to historical rates. It reaches a total installed capacity of around 2,200 MW by 2024-25.

Distributed solar generation in South Australia has reached a level that is starting to raise some challenges with the operation of the power system. The challenges include disconnection of distributed solar generation in response to voltage disturbances, network voltage management and minimum levels of demand needed to operate the power system in islanded conditions.

Households and businesses should have the choice to take up solar generation. However, to maximise consumers ability to take up this technology, mechanisms are required to actively manage solar generation when it is necessary for system security purposes.

Dynamic export limits can increase the amount of distributed solar generation that can be connected to the power system. It is considered preferable to alternative options which may not provide for continued installation of distributed solar generation, hard capacity or export limits, or costly power system investment which could increase electricity prices for all electricity customers.

Dynamic export limits may also be an attractive commercial offering which could be offered to customers for financial reward.

As solar generation continues to be added to the distribution network, it is prudent to future proof the technical capability of the technology that is installed.

2. The move to dynamic export limits

In March 2019, Energy Networks Australia released the *National DER Connection Guidelines*, specifically for low voltage embedded generation connections. This has been adopted by South Australia's Distribution Network Service Provider (DNSP), SA Power Networks (SAPN), and sets out the framework, principles, approach and technical setting for Australian DNSPs to adopt in the development and application of their technical requirements for grid connection of DER.

SAPN's network infrastructure has a finite capacity to accommodate the connection of DER, before technical issues arise. In some instances, remediation of these issues may be uneconomic and not in the best long-term interests of all cost sharing electricity customers.

In accordance with the guidelines, SAPN has introduced an export limit for three-phase inverter energy systems (IES) across South Australia. As of April 2019, the export limit for three-phase IES has been reduced from 30kW to 5kW per phase (for a total maximum of 15kW), with a balanced output with no more than 5kW unbalance between any phases as per AS/NZS 4777.1.

The introduction of dynamic export limits would provide the opportunity for more customers to install solar generation and not be subject to fixed limits on the size or export limits of the system.

Dynamic export limits have been recognised by SAPN as part of their 2020-2025 regulatory proposal, proposing a low voltage management business case that (amongst other things) introduces dynamic export limits. This would be done by publishing dynamic export limits to customers and DER aggregators, including operating the systems associated with low voltage network constraint calculation and the ongoing publication of dynamic export limits to small embedded generators, aggregators and virtual power plant operators.

3. Proposed Technical Standard

Given the rate of installation of distributed solar generation in South Australia, it is considered prudent and efficient to ensure installed systems have the technical capability to participate in dynamic export limits.

Stakeholder feedback is sought on whether the dynamic export limits for other distributed generation technology, including battery storage, would be of value.

It is proposed that a new technical standard would require distributed solar generation to be capable of being export limited. Distributed solar generation would be considered capable of being export limited if the energy exported to the distribution network from the plant can be programmed to keep to thresholds which may vary at different times of the day.

The technical standard would require that the export limits must be capable of being updated remotely. This means that the programmed export limits can be updated without a person being required to attend the site of the distributed solar generation.

The intention is that the proposal is technology neutral, allowing the competitive market to determine the most efficient way of meeting these technical standards.

To provide industry and installers with guidance of technical solutions that meet the standard, it is proposed that the Technical Regulator may issue a guideline deeming particular technical solutions. An installer that follows a technical solution in the Technical Regulator guideline would be deemed to have met the standard.

4. Application of the Technical Standard

The technical standard will be mandatory for all new distributed solar generation. It is also proposed to apply to existing distributed solar generation if any part of a person's electricity infrastructure prescribed by the Technical Regulator is being replaced.

The prescribed parts of a person's electricity infrastructure for replacement purposes is dependent on the competitive market solutions to meeting this technical standard. For example, if this technical standard was met through the inverter, the Technical Regulator may prescribe inverter replacement as a trigger for implementing this standard for existing distributed solar generation.

The obligation will apply to the:

- owner/operator of the distributed solar generation – to take reasonable steps to ensure it complies with the technical standard.
- installer of the distributed solar generation – must only carry out work of connecting an electricity installation if it complies with the technical standard.
- owner of distribution network – must only allow solar generating plant to connect to their distribution network if it meets the technical standard.

5. Proposed Implementation Pathway

It is proposed that the Electricity (General) Regulations 2012 (the Regulations) will be amended to provide that solar generating plant must be capable of being export limited and for export limits to be updated remotely.

The requirement will apply to solar generation plant that is connected to the distribution network, including solar generating plant which is exempt from the requirement to hold a licence.

The requirement will apply to new solar generating plant connected to the distribution network and existing solar generating plant connected to the distribution network if a prescribed part of the persons electricity infrastructure is being replaced. The Technical Regulator will be responsible for prescribing parts of electricity infrastructure which trigger compliance with this standard on replacement.

The Technical Regulator may issue a guideline on installation methodologies for solar generating plant that are deemed to meet this requirement.

The owner/operator of the distribution network will not be allowed to connect any new solar generating plant to the network if it is not capable of being export limited and for export limits to be updated remotely.

The relevant compliance and enforcement provisions that will apply to this technical standard are:

- Section 60(1) of the *Electricity Act 1996* (the Act) requires a person who owns or operates electricity infrastructure must take reasonable steps to ensure the infrastructure complies with, and is operated in accordance with, technical and safety requirements imposed under the Regulations.
- Section 60(1b) of the Act requires that the owner or operator of an electrical installation must take reasonable steps to ensure the installation is compliant with technical and safety requirements imposed under the Regulations.
- Section 61 of the Act requires that persons carrying out work on an electrical installation must ensure that the work is carried out as required under the Regulations.
- The maximum penalty for noncompliance with either section 60 or 61 is \$50,000 for a body corporate or \$10,000 in other cases. An expiation fee of \$315 is applicable.

In accordance with Section 60(2), an owner or operator of an electrical installation may rely on a certificate of compliance as evidence that the installation complies with the safety and technical requirements.

6. Proposed Timeline

The new requirement is proposed to commence on 1 January 2021. It will have immediate effect, meaning a solar generating plant which does not meet the technical standard must not be installed after the commencement date.

Stakeholder feedback is sought on whether there is existing technology which is capable of export limits and whether there is existing technology that is capable of having export limits updated remotely. For technology that requires modification, stakeholder feedback is sought on forecast timeframes for such modifications.

7. Consultation Timeline

The Department for Energy and Mining invites comments on the proposed export limit requirements for solar generating plants in South Australia from stakeholders and other interested parties by 5PM (ACST) on 10 July 2020.

Stakeholders can provide written submissions by emailing: ETRConsultations@sa.gov.au.