Department of Climate Change, Energy, the Environment and Water

NSW Emergency Backstop Mechanism and Consumer Energy Resources Installer Portal

Consultation Paper

February 2025

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

NSW Emergency Backstop Mechanism and Consumer Energy Resources Installer Portal

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1 Overview

The NSW Consumer Energy Strategy commits to begin public consultation on new measures to:

- restrict solar exports from rooftop solar during emergencies when necessary to prevent blackouts and improve reliability (Action 43) and,
- introduce a new digital smart compliance system to support monitoring and compliance with a range of standards (Action 37).

Households and small businesses across NSW have a growing role in helping the NSW energy system evolve from a centralised, fossil fuel-dependent system towards a decentralised, consumer-driven and renewable energy future. Many are already investing in rooftop solar, batteries and other Consumer Energy Resources (CER). They are seeing the benefits of lowered energy bills and reduced emissions and are playing an active role contributing to our transition to a net-zero future.

Fully realising the benefits of these technologies means having the right systems and supports in place to maximise opportunities while minimising risks to the grid.

This paper outlines how the NSW Government intends to:

- require NSW Distribution Network Service Providers (DNSPs) to manage solar exports during emergency situations to mitigate the risk of system blackouts and,
- introduce a new digital tool to improve how energy saving technologies are installed.

Emergency Backstop Mechanism

Over 943,000 NSW households and small businesses have rooftop solar systems[1], which is about a quarter of all NSW households. Households that exported solar supplied an average of 6% of the electricity generated in the NSW grid in 2022-23[2].

Electricity distribution networks were originally set up to transport electricity in one direction only. The arrival of CER, like solar panels and batteries means consumers can also be producers of electricity and can transport electricity in the other direction.

This two-way model of energy distribution provides many benefits for customers and the wider electricity system. However, the flow of electricity from households and businesses back to the electricity grid must be carefully managed so the grid's reliability is not disrupted. The growth in solar panels on households and small businesses can pose challenges for the grid because solar generation is unable to provide the system strength and inertia services that traditional power stations, hydro generation and large-scale batteries are able to provide. During times of high solar energy production, this has the potential to result in grid demand dropping below the required minimum demand levels needed to maintain grid security and stability. In these circumstances, other generation sources are curtailed to maintain supply-demand balance.

[1] Rooftop solar data calculated using Australian PV Institute, Mapping Australian Photovoltaic installations (2024), https://pv-map.apvi.org.au/historical

[2] Rooftop solar data calculated using Australian PV Institute (2022-23), Mapping Australian Photovoltaic installations, https://pv-map.apvi.org.au/historical

There are a number of measures underway to address the issue of minimum demand, including work being undertaken as part of the NSW Consumer Energy Strategy to provide greater flexibility in solar export limits to reflect the capacity of the grid; the National Consumer Energy Resources Roadmap, aimed at improving CER standards and access to the energy market; and complementary measures, such as tariff reform, that provide pricing signals to customers.

However, the Australian Energy Market Operator (AEMO) has advised there is a need to introduce an Emergency Backstop Mechanism to flexibly curtail solar exports from solar systems installed or upgraded from Spring 2025 onwards when necessary (such as during periods of minimum demand and high solar supply). The goal of this is to develop long-term protections for all customers by preventing blackouts and grid instability while continuing to enable more customers to install energy saving technologies into the future.

This consultation paper provides detailed information about minimum demand, why it is a problem, current mitigating measures, and questions about how an Emergency Backstop Mechanism would be implemented in NSW.

Consumer Energy Resources Installer Portal

Households and small businesses are increasingly making sustainable choices and purchasing energy saving technologies. The NSW Government has a role to play to ensure these technologies are being installed in a way that upholds customer and worker safety, and the reliability of our energy system.

The NSW Government proposes a series of actions within the NSW Consumer Energy Strategy to improve compliance with key CER standards in NSW. Action 37 proposes a new Consumer Energy Resource (CER) Installer Portal (the Portal) to improve standards at the point of installation of CER devices.

The Consumer Energy Resources Installer Portal (referred to in this document as the Portal) will streamline processes for CER installers, improve compliance with key standards and processes, and provide valuable data on CER installations in NSW. The Portal will also facilitate the registration and testing of installed CER devices with all three NSW Distribution Network Service Providers (DNSP) utility servers, which will support the introduction of an emergency backstop mechanism in NSW.

This paper will outline the NSW Government's approach to delivering a CER Installer Portal, and the benefits of a Portal in NSW including how it can support the Emergency Backstop Mechanism.

Give your feedback

The purpose of this consultation paper is to invite feedback on the proposed approach to implementing an Emergency Backstop Mechanism and CER Installer Portal in NSW.

We welcome your feedback on the questions asked in this paper and welcome any other feedback. All feedback will be considered and used to develop the Emergency Backstop Mechanism and CER Installer Portal in NSW.

Sections 1-3 of this paper provide background and context. Section 4 onwards provides more specific information and questions related to the backstop and installer portal.

How to respond

You can provide feedback to the questions posed in this paper along with any additional feedback through the NSW Government's Have your say website. You can also provide feedback by emailing energy.consumerpolicy@dpie.nsw.gov.au.

Publishing submissions

The NSW Government is committed to an open and transparent consultation process. Unless a submission or part of a submission is requested to be confidential, all submissions may be made publicly available on our website. Only your organisation's name will be published. We will remove personal details from submissions made by individuals.

If you would like your written submission, or parts of it, to remain confidential, please clearly state this in your submission.

Please be aware that even if you state that you do not wish certain information to be published, there may be legal circumstances that require the NSW Government to release that information, for example under the *Government Information (Public Access) Act 2009.*

Consultation timeframes

Stage	Date
Consultation opens	Monday 10 February 2025
Consultation closes	Friday 7 March 2025
Submissions published	March 2025

2 Introduction

Solar context in NSW

Energy consumers in NSW are embracing solar enabling them to reduce their energy bills and become active participants in the energy system. Over 943,000 NSW households and small businesses now have rooftop solar systems[3], roughly a quarter of all NSW households. According to the Clean Energy Regulator over 480,000 new solar systems have been installed since 2020[4].

Across the National Electricity Market (NEM) rooftop solar makes up nearly a quarter of generation capacity[5] and this is predicted to grow as more consumers choose to install solar.

The NSW Government is supporting solar uptake across the community and helping customers to maximise the benefits from their investments. Some of the actions to increase solar uptake include:

- introducing a target for 1 million NSW households and small businesses to have access to rooftop solar and battery systems by 2035 and 1.5 million by 2050
- delivering a new Home Energy Saver program to help customers cut their energy bills and reduce their emissions
- delivering a $30 million Solar for Apartment Residents program to help apartment residents reduce their bills by investing in solar energy
- piloting the roll-out of solar and battery virtual power plants and full home electrification with select social housing premises
- developing new model by-laws to help owner's corporations with the installation of energy saving technologies
- ensuring customers do not pay net solar feed-in tariff charges after the introduction of two-way export charges
- working with NSW distributors to trial new ways to make solar export limits more flexible so customers can get more value from their solar panels
- working with Standards Australia to accelerate the adoption of new standards to enable greater solar capacity and energy exports at multi-tenanted sites in NSW
- working to implement a $175 million Social Housing Energy Performance Initiative (SHEPI) to fund solar panels for social housing residents.

You can read more about these actions in the NSW Consumer Energy Strategy.

[3] Rooftop solar data calculated using Australian PV Institute, Mapping Australian Photovoltaic installations (2024), https://pv-map.apvi.org.au/historical

[4] Small-scale installation postcode data, Clean Energy Regulator (2024), https://cer.gov.au/markets/reports-and-data/small-scale-installation-postcode-data#Small-generation-unit-SGU-installations

[5] Fact Sheet: The National Energy Market, AEMO (2024), https://www.aemo.com.au/-/media/files/electricity/nem/national-electricity-market-fact-sheet.pdf

What is minimum demand

Traditionally electricity has been generated by centralised power stations that supply energy to the grid. As CER has become more common, the electricity system has evolved into a two-way system, with households and businesses able to supply more of their own energy from behind-the-meter systems, such as rooftop solar photovoltaic (PV) units. While this presents many opportunities, it also presents challenges, including operational demand levels that risk being sufficiently low that it is no longer possible to maintain system security with the present operational toolkit.

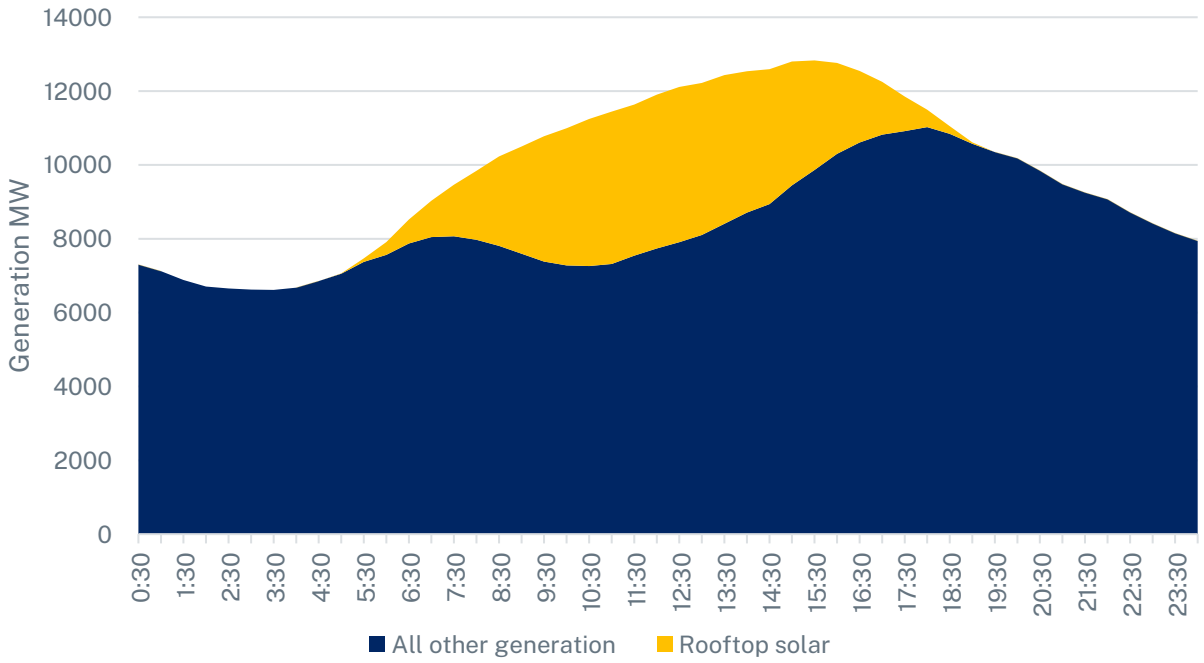

Figure 1 - Rooftop solar generation in NSW on an average summer day in 2023 (Source: AEMO)

The Australian Energy Market Operator (AEMO) is responsible for managing the day-to-day operation of the energy market, and actively manages the dispatch of energy from centralised generators (coal, gas, large-scale solar, wind and hydro units) to maintain a precise demand-supply balance. AEMO is also responsible for ensuring the security of the power system, which requires a range of essential system services such as voltage control, system strength,[6] and inertia[7].

Centralised generators currently provide electricity to the grid along with essential system security services to maintain minimum levels of system strength and inertia. Currently, some units must be kept online to provide essential services, which need to generate above their minimum safe operating levels. As such, with the present operational toolkit, operational demand must be maintained above this threshold for the grid to operate securely.

Distributed photovoltaics (DPV), like rooftop and small scale solar, are unable to provide these system strength and inertia services. With an increasing number of DPV systems being connected to the grid, during times of high solar energy production, this could make grid demand drop below

[6] System strength is the power system's ability to overcome disturbances, such as unexpected generator outages, faults and large load trips, while maintaining strong voltage waveforms (voltage control).

[7] Inertia maintains the frequency of the grid and is used to absorb surges, imbalances in supply and demand, and recover from system shocks. This is provided by synchronous generators in traditional power stations. Synchronous condensers and batteries can deliver many of these essential services but are only available to a limited degree at present.

the required minimum demand to maintain grid security and stability. This creates several challenges and can affect AEMO's ability to manage the grid.

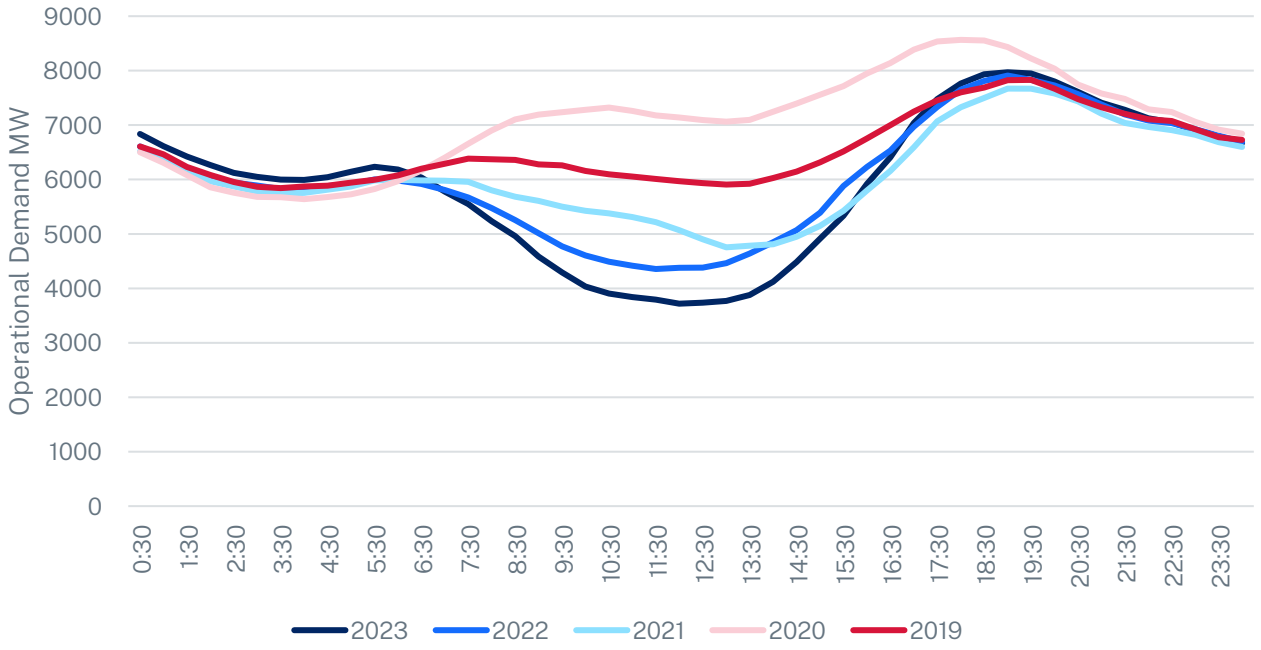

Figure 2 - Operational demand in NSW on the last Sunday in October for the last 5 years over a 24-hr period (Source: AEMO)

How will minimum demand impact NSW households and small businesses

AEMO reports that the NSW-ACT region has seen periods with DPV supply more than half the underlying load in the region in 2023. The region reached 55% DPV share of underlying demand in 2024, with over half the generation in the region not actively managed. This means NSW has set new minimum demand records below 3,150 MW throughout October 2024.

In their 2024 Transition Plan for System Security published in December 2024[8] report AEMO notes that this level of DPV generation is moving towards a situation where it does not confidently have the sufficient operational levers to operate the power system securely as the system reaches the minimum demand threshold. AEMO also notes that scenario could be further exacerbated by atypical events occurring at the same time (like extreme weather events, interconnectors going offline and power station outages).

Figure 3 outlines AEMO's historical and projected minimum operational demand thresholds for NSW-ACT and Figure 4 shows AEMO's historical and projected minimum operational demand thresholds for the NEM. These graphs show that unless proactive steps are taken, AEMO would need to request DNSPs to disconnect whole neighbourhoods with high rooftop solar exports during these atypical events. This is known as reverse feeder shedding.

[8] AEMO, 2024 Transition Plan for System Security, December 2024 - https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/transition-planning/aemo-2024-transition-plan-for-system-security.pdf?la=en

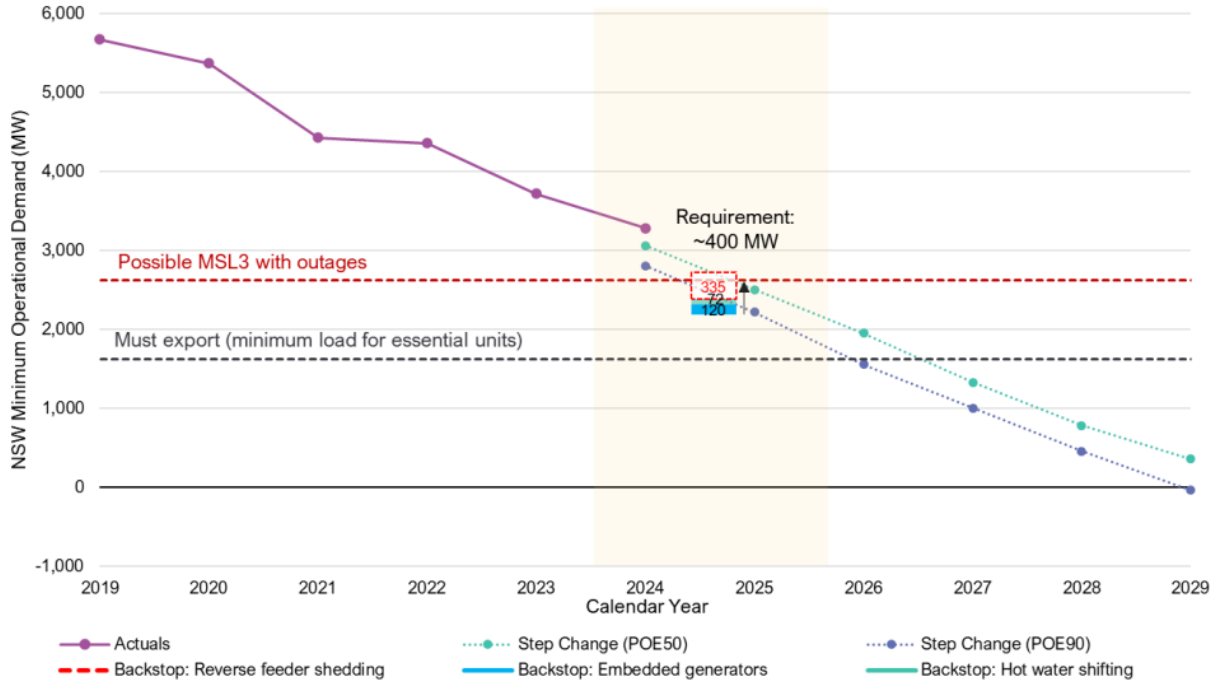

Figure 3 - Minimum Operational Demand thresholds and projections for NSW-ACT (Source: AEMO)

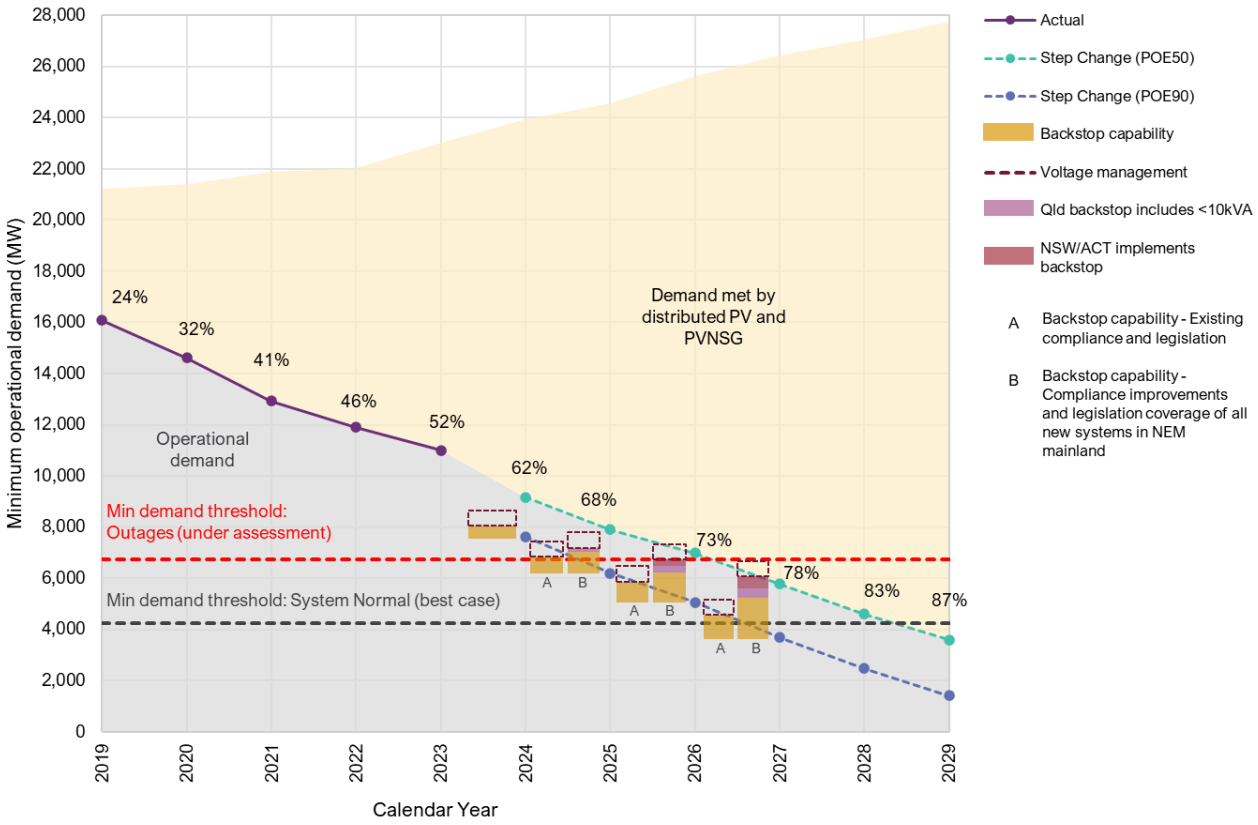

Figure 4 - Minimum Operational Demand thresholds and projections for the NEM (Source: AEMO)

Further information on minimum demand levels in the NEM can be found on AEMO's website:

AEMO Fact Sheet: Minimum system load (MSL)

AEMO Fact Sheet: Rooftop solar management

AEMO Managing Minimum System Load (MSL)

The opportunity of CER in NSW

More energy customers are installing CER in NSW

Households and small businesses across NSW have a growing role in helping the NSW energy system evolve from a centralised, fossil fuel-dependent system towards a decentralised, consumer-driven future. Many are already investing in rooftop solar, batteries and other CER. They are seeing the benefits of lowered energy bills and reduced emissions and are playing an active role contributing to our transition to a net-zero future.

CER is transforming our energy system

Electricity distribution networks were designed to deliver electricity in one direction – from central power stations to households, businesses and other energy customers. Our distribution networks now operate in two directions, facilitating the flow of power from generators to consumers, and from rooftop solar and batteries back to the grid.

As the penetration of rooftop solar increases, DNSPs are increasingly facing technical constraints on the amount of solar they can host on each distribution line. This can affect power quality and the reliability of our distribution networks, causing disruptions for other customers.

DNSPs have needed to limit the size of the systems customers can install in some locations to ensure grid security to avoid disruptions. The increase of unmanaged solar exports can also mean costly upgrades to energy distribution systems, which may increase costs for all consumers.

Opportunities with improved CER

Better integration of CER devices into the grid and improved understanding of the CER devices on a network can allow DNSPs to use more of the solar customers are producing. With the protection of an Emergency Backstop Mechanism to curtail new, upgraded and replacement solar systems when there is not enough demand for energy, and flexible limits on solar exported to the grid, DNSPs can allow more solar into the grid. This means the energy system will get more of the renewable energy generated from our houses, and customers can benefit from exporting more of their solar.

To enable these benefits, CER needs to be installed and configured to the right settings. Making sure that installations are compliant and that devices are registered correctly with DNSP systems is critical to ensuring safety and grid stability. It is also essential to unlock new opportunities to accommodate more solar and batteries, and better use those resources into the future.

Issues with current CER installation system and processes

Data on CER in NSW is limited

Installers of CER in NSW are required to provide information about the CER they install to networks, AEMO and the NSW Government through a Certificate of Compliance of Electrical Works (CCEW) and through entering install information onto AEMO's Distributed Energy Resources (DER) register. Compliance with these requirements is low, and DNSPs have raised concerns that they have limited visibility over CER connections on their own networks.

A lack of visibility of CER also has the following impacts:

- Inability for DNSPs to manage grid reliability.
- Reduced opportunities for consumers to become active participants in the energy market.
- Limited data to support government policy development and enable future energy opportunities.

Lack of standardised procedures

CER installers have also raised concerns about difficulties navigating connection and other administrative processes in NSW. To connect CER to a network in NSW, CER installers currently need to apply through a different process depending on the network area they are installing in. These processes can vary greatly depending on the network and connection type, and timeframes for approval differ between networks. In addition, installers must also complete separate administrative processes to complete the CCEW and submit to NSW Fair Trading and respective DNSPs, and the AEMO DER register after installation. The two different systems contain many of the same information requirements.

High levels of compliance will be crucial for future grid management

Compliance with technical standards is crucial to unlocking the full benefits of CER for the grid and individuals. Standards ensure that technology is installed safely and able to operate to its full capability.

Compliance with some technical electrical standards in NSW is low. AEMO reported in 2023 that only 37% of newly connected CER devices across the NEM were correctly configured to the mandatory standard AS/NZS 4777.2:2020[9].

Non-compliance with standards creates immediate concerns around safety and grid reliability and stability and could impact on consumer confidence in these new technologies. These issues will only be exacerbated as more energy technology is connected to the electricity grid.

A high level of compliance with standards is critical to enabling future energy policy to continue consumer-centric benefits.

Common Smart Inverter Profile – Australia (CSIP-AUS) is emerging as a critical implementation guide for CER communication in the future. CSIP-AUS allows two-way communication and exchange of data between devices (inverters) and the managing body (DNSPs). It can be used to curtail (reduce) solar exports to the grid, providing an Emergency Backstop Mechanism. The standard can also be used to implement flexible exports or dynamic pricing programs, enabling customers to better benefit from their energy technology and helping DNSPs to manage the grid. The National CER Roadmap has a target for national adoption of a harmonised approach to CSIP-AUS in 2027.

NSW will need to ensure compliance with CSIP-AUS for NSW households to be able to benefit fully from future energy policies and innovations.

[9] AEMO "*Compliance of Distributed Energy Resources with Technical Settings: Update*" December 2023 - https://aemo.com.au/-/media/files/initiatives/der/2023/oem_compliance_report_2023.pdf?la=en

3 What is currently being done in NSW

NSW Consumer Energy Strategy

The NSW Consumer Energy Strategy (referred to as the Strategy) puts people at the centre of the net zero energy transition. It has 50 actions to keep energy bills low, help achieve net zero emissions, make the energy system more reliable and ensure everyone can benefit from, and participate in, the energy transition.

The Emergency Backstop Mechanism (Action 43)

Action 43 of the strategy commits to begin public consultation on new measures to restrict solar export during emergencies when necessary to prevent blackouts and improve reliability.

The Strategy notes that there may be some circumstances where controls are needed to restrict solar exports to support energy security and safety, and that the NSW will consult on options to introduce new regulatory and technical powers to restrict solar exports during grid emergencies. The goal of this is to develop long-term protections for all customers by preventing blackouts and grid instability while continuing to enable more customers to install energy saving technologies into the future. If done through using smart protocols such as CSIP-AUSit will also enable additional customer benefits through new optional services such as flexible exports and dynamic pricing.

CER Installer Portal (Actions 37 and 44)

Action 37 introduces a new digital smart compliance system to support monitoring and compliance with a range of standards. This will improve compliance by facilitating the testing and enrolling of devices into DNSP utility servers. Inbuilt compliance and enforcement mechanisms will incentivise installers to close out installations correctly.

Action 44 require installers of energy saving technologies to provide necessary information required under AEMO's Distributed Energy Resources Register (DERR) to the relevant distribution network. The Portal will capture critical information from installers about CER installed and this will be sent directly to AEMO and DNSPs through the Portal.

Actions to address minimum demand

The Strategy has actions to support the energy system to deal with minimum operational demand. These include:

Action	Description
Action 8. Deliver new incentives for households and businesses to install batteries and join virtual power plants through the Peak Demand Reduction Scheme.	In May 2024, the NSW Government committed to expand the PDRS to include incentives for household batteries, making them more accessible and affordable for NSW residents and businesses. Installing more batteries across NSW will help homes and businesses maximise the use of the solar energy they generate, cut the cost of electricity bills, make the grid more reliable and stable, and reduce our reliance on fossil fuels during periods of peak demand.

Action 10. Investigate incentives and other support for EV owners to install and use smart or bidirectional chargers.	Smart and bidirectional EV chargers provide control over how and when EV owners charge their EV. Charging EVs during the day, when solar output is at its highest and electricity is at its cheapest, will result in less exports to the grid, increasing operational demand within the energy system.
Action 17. Investigate seeking a regulatory waiver from the Australian Energy Regulator to enable distribution networks to support the uptake of local network batteries, subject to meeting criteria.	Distribution networks are uniquely placed to identify where local network batteries can be most efficiently integrated into the electricity network in a manner that best supports unlocking the greatest financial value. However, national rules prevent distribution networks from leasing out the spare capacity of local-network batteries that they own. The NSW Government is reviewing the definition of long-duration storage under the Electricity Infrastructure Investment Act 2020, which could help incentivise more battery storage. The government will also investigate seeking a class waiver from the Australian Energy Regulator (AER) on behalf of distribution networks. This could allow the distribution networks to lease out the spare capacity of their proposed local network batteries that are successful in bidding for co-investment through a competitive government process. These reforms could help the NSW distribution networks to accelerate their local network battery programs.
Action 34. Work with NSW distributors to trial new ways to make solar export limits more flexible so customers can get more value from their solar panels.	The NSW Government will work with energy distributors to introduce new trials for customers with rooftop solar panels, household batteries, and EV chargers to participate in flexible exports. This means that rather than having a fixed limit on how much solar can be exported from a site, the amount can vary based on the needs of the grid. Flexible exports will help customers with solar panels, batteries and EV chargers to maximise the amount of energy exported to the grid and increase benefits. It will also help distribution networks manage grid stability and reliability. The CER Installer Portal will support this action. The CER Installer Portal will provide a mechanism for the testing and enrolling of devices within DNSP utility servers. This same technology will allow DNSP trials of flexible exports through registered devices.
Action 40: Use NSW Government programs to accelerate adoption of technical and performance standards for energy saving technologies.	The NSW Government has committed to investigate options to accelerate the adoption of Common Smart Inverter Profile – Australia (CSIP-AUS) and IEEE 2030.5 standards to improve two-way communication and exchange of data and enable better compatibility (or interoperability) between devices through grant and support programs being delivered in the near term. These programs present opportunities for new procedures to be piloted before they are rolled out for industry-wide implementation in NSW.
Action 41: Support the introduction of national smart EV	The NSW Government is working with the Commonwealth and other jurisdictions to develop nationally consistent standards for smart and bidirectional EV charging which will includes an update to the AS/NZS

charging standards and vehicle to grid standards in NSW	4777 standard to allow bidirectional EV chargers to be connected to the grid.

Standards and compliance actions

The CER Installer Portal will be key in improving compliance with CER standards in NSW. However, the development of the Portal must be complemented and supported by other actions to address other elements of non-compliance. These include:

Action 36: Boost compliance with technical and safety standards by increasing the number of electrical safety inspectors.	DCCEEW is providing the NSW Building Commission (BC) $11 million over 10 years to increase the number of electrical safety inspectors to inspect home energy installations. DCCEEW is also working with BC to uplift inspection capacity of key standards, and to highlight high risk areas for inspection. These changes will improve the ability of BC to enforce compliance of CER installers with key safety standards for CER installs. The CER Installer Portal, when implemented, will support this action by providing crucial data for the BC to support more targeted enforcement action.
Action 38. Introduce new support for industry training for energy saving technology installers and investigate new credentials to respond to training gaps.	The NSW Government Consumer Energy Strategy commits to introducing new support for industry training to ensure installers of home energy saving technologies comply with safety and technical standards. DCCEEW will also investigate the development of training to respond to training gaps and needs identified through electrical safety inspections for this cohort. DCCEEW will engage with DNSPs on this action in early 2025. Implementation of the CER Installer Portal will include training for CER installers to be able to use the Portal. This training will likely incorporate basic training around complying with key standards in installations. Later tranches of the CER Installer Portal may require additional training for installers before they are able to use the portal to install CER.
Action 39. Conduct a review of the NSW electrical and gas safety regulatory framework.	DCCEEW will undertake a review of the electricity and gas regulatory framework, to more clearly define roles and responsibilities for electrical and gas safety across regulators within NSW. Greater clarity around roles and responsibilities, and a strengthened legal framework for electrical and gas safety will greatly support compliance and enforcement of CER standards. DCCEEW is currently at the scoping stage of this action and will release a draft terms of reference for consultation in 2025.

National Consumer Energy Resources Roadmap

In October 2021, the Energy National Cabinet Reform Committee agreed to a recommendation by the Energy Security Board that emergency backstop measures be adopted as an immediate reform. The Energy Security Board's report Consumer Energy Resources (CER) and the Transformation of

the National Electricity Market (NEM)[10] reiterates the importance of ensuring all states and territories implement a backstop capability that is robust and reliable in each jurisdiction to provide an emergency response improving operational security for all consumers.

The National Consumer CER Roadmap includes an action for Jurisdictions and AEMO to implement backstop capability that is robust and reliable in each jurisdiction to provide an emergency response improving operational security for all consumers. This action is tabled to start in 2024 and be completed in 2025.

The National CER Roadmap also includes reforms to increase the market participation of CER. It is anticipated that over time that the capabilities and frameworks will develop to enable and incentivise and CER to be better integrated within the power system and market.

The National CER Roadmap reforms include the below:

- A national regulatory framework for CER to enforce standards.
- Mechanisms that incentivise customers to choose to have their CER coordinated by market actors in line with market signals and system needs.
- Mechanisms for coordinated CER to deliver automated and streamlined methods for the management of customer distributed PV systems within normal market dispatch systems.
- Redefining the roles and responsibilities for market and power system operations.
- Data sharing arrangements to inform planning, enable future markets, and support effective power system operation.
- Improving voltage management across distribution networks.
- Incentivising distribution network investment in CER.

Further information on the National CER Roadmap can be found here:

Department of Climate Change, Energy, the Environment and Water: National CER Roadmap

Solar export limits

Electricity distribution networks may place export restrictions on solar systems to avoid damaging critical infrastructure, including service wires and transformers, and to avoid blackouts. These limits are often stricter in regional areas. Regional networks serve a more thinly spread customer base and require infrastructure for smaller flows of electricity. This means that, while the networks are all built to the same standards, regional networks can be more susceptible to damage from sudden export spikes.

Solar export limits reduce the amount of excess solar generation that individual customers can be feeding back into the grid, reducing the risk of minimum demand events.

[10] Consumer Energy Resources and the Transformation of the NEM, Energy Security Board (2024), https://www.energy.gov.au/sites/default/files/2024-02/ESB%20report%20-%20CONSUMER%20ENERGY%20RESOURCES%20AND%20THE%20TRANSFORMATION%20OF%20THE%20NEM.pdf

4 The Emergency Backstop Mechanism

A critical last-resort tool to keep the power system secure under emergency conditions

There are some circumstances where controls are needed to restrict solar exports to support energy security and safety.

Given the increased uptake of rooftop solar and the increasing frequency of weather-related events, an Emergency Backstop Mechanism will enable greater control of electricity supply within the grid to ensure grid security. It will also reduce the need for the use of more blunt measures, such as disconnecting distribution feeders from areas with high solar generation, which can result in greater consumer impact.

The Emergency Backstop Mechanism will give DNSPs the ability to temporarily curtail (reduce) the generation of rooftop solar installed or upgraded after Spring 2025, when directed by AEMO to restore and maintain regional demand above the thresholds required. It is envisaged that this would result in a temporary reduction of some solar customer's exports to the electricity grid. Depending on the volume of solar export reduction required, it could also result in solar rooftop generation being switched off entirely.

The Emergency Backstop Mechanism would only be intended for use during emergency conditions. Solar and non-solar customers would still be able to consume power from the grid when the emergency backstop is activated.

The Emergency Backstop Mechanism will only apply to new solar installations and replacement/upgraded systems from the date of implementation of the backstop mechanism. Existing solar installations will not be covered through the implementation of a CSIP-AUS backstop mechanism, but may be covered through the use of emergency voltage management or active DPV management during MSL events. Existing NSW households and businesses with solar will be largely unaffected by this measure.

Implementing a mechanism that allows flexible reduction of solar exports will also ensure that customers are only impacted to the degree needed to maintain system security. The technology used to implement the Emergency Backstop Mechanism could also be used in the future to implement flexible exports, further increasing the uptake of solar without network upgrades.

Other jurisdictions across the NEM, including South Australia, Victoria and Queensland have already implemented emergency backstop capabilities due to high levels of rooftop solar penetration. The implementation and operation of these mechanisms vary from state to state, but all provide the ability to remotely disconnect compatible rooftop solar systems during a grid emergency. Some states also have the ability to reduce or turn down (curtail) solar as needed during emergency conditions to further reduce the impact on consumers, using technologies that will enable flexible exports for customers in the future. The NSW Government is also working with the ACT Government with the view to harmonising approaches between the two jurisdictions.

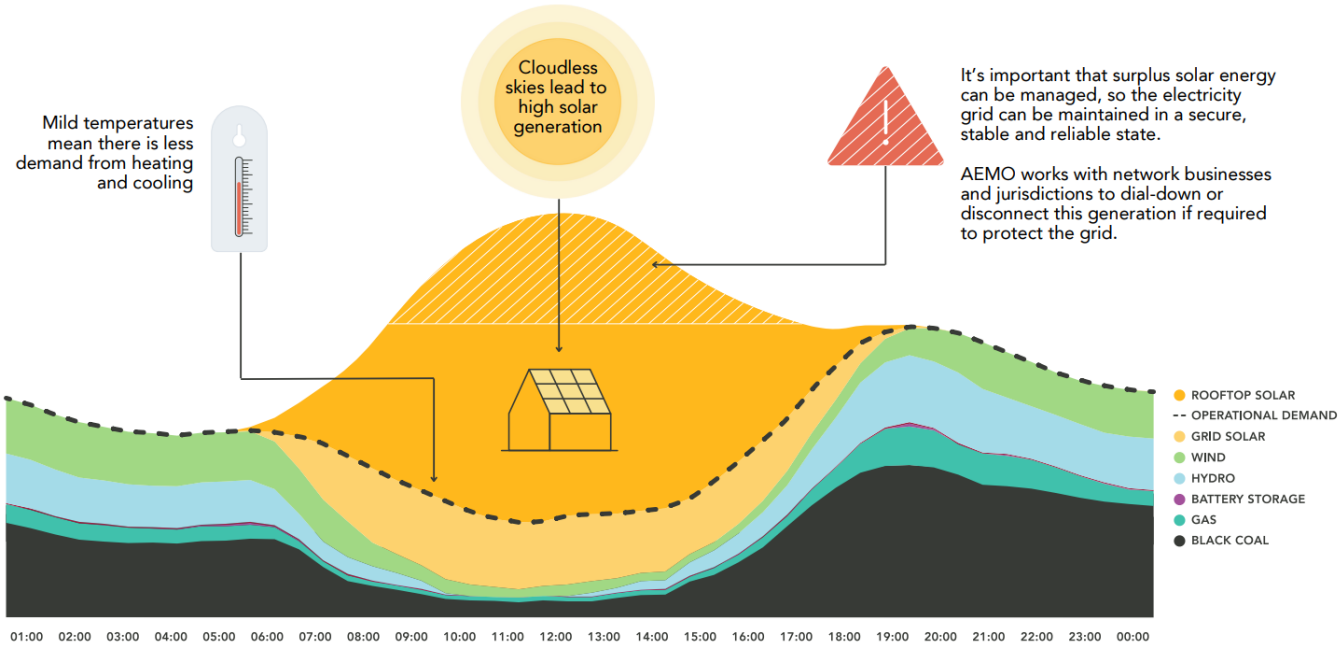

Figure 5 - Challenges of rooftop solar (Source: AEMO)

Emergency backstop measures have also been used to manage DPV contingency risks. A large proportion of DPV generation can shake-off (disconnect) in response to a transmission network fault. This can occur coincident with the trip of a large generating unit, such that the largest credible contingency in a region becomes the size of the generating unit that trips, plus the amount of distributed PV generation that shakes off.

At times of heightened system security risk in South Australia, the Emergency Backstop Mechanism has been used to reduce this contingency[11]. To mitigate this risk, disturbance ride-through requirements were introduced into AS/NZS 4777.2:2020. Compliance, while initially low, has been gradually improving since then through concerted effort by AEMO, DNSPs and industry. Emerging use cases for emergency curtailment are under assessment, including system restart requirements and cybersecurity threat response.

Advice from AEMO

AEMO has recommended Governments introduce regulatory frameworks for Emergency Backstop Mechanisms in all NEM mainland regions by Spring 2025[12]. This mechanism should enable the reduction and disconnection of DPV generation in emergency situations to manage system security.

AEMO has stated that its objective is to support a transition towards common (national) functional requirements and implementation over time for an emergency backstop. AEMO acknowledges the need to balance consistency with the timely implementation of backstop capabilities and that jurisdictions may have preferred technology approaches due to existing technology capabilities.

AEMO has also written formally to the NSW Minister for Energy regarding 2024 spring readiness for electricity and gas markets. AEMO's letter highlights the risk of minimum demand events occurring

[11] Trip of South East – Tailem Bend 275 kV lines on 12 November 2022, AEMO (2023), https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/power_system_incident_reports/2022/trip-of-south-east-tailem-bend-275-kv-lines-november-2022.pdf

[12] Supporting secure operation with high levels of distributed resources, AEMO (2024), https://aemo.com.au/-/media/files/initiatives/der/managing-minimum-system-load/2024-minimum-demand-and-emergency-backstop.pdf

across some mainland regions and recommends the introduction of emergency backstop capabilities for the NSW-ACT NEM region by spring 2025, consistent with the National CER Roadmap.

NSW DNSP readiness

Consultation with the NSW DNSPs found that, for small solar systems, they have previously run various trials of Dynamic Operating Envelopes (DOEs) which have demonstrated their ability to implement the key internal technical capability at 'proof-of-concept' maturity to deliver solar export curtailment. Using this technology approach could emulate the DOEs being used for curtailment in SA and Victoria.

In NSW, all DNSPs have set regulatory allowances for the period 2024-29. There is likely to be a need for DNSPs to apply to the AER to pass through costs incurred for the emergency backstop implementation where capabilities did not form part of their 2024-29 allowances.

The NSW Government has had initial conversations with the DNSPs to understand their current readiness and the role they see for the NSW Government to support implementation of an Emergency Backstop Mechanism.

NSW Government proposed approach

The NSW Government has a number of outcomes that it intends to achieve when implementing a backstop mechanism. These include:

Harmonisation

The NSW Government recognises the opportunity to harmonise the Emergency Backstop Mechanism across NSW and other jurisdictions, most prominently the ACT. However, a nationally consistent approach may not be achievable by Spring 2025, when a mechanism is required in NSW for system security. The NSW Government will continue to work closely with other states and territories to develop a national approach, with the view to harmonise the jurisdictional systems over time.

The National CER Roadmap contains an action to establish secure communication systems for CER devices (action T.3). This action's goal is to establish Public Key Infrastructure (PKI) to operate and manage authentication of communication protocols for the backstop, with the development of nationally consistent CER technical standards (T.1) and the establishment of a national regulatory framework for CER (T.2) also intended for delivery.

Ahead of the implementation of national communication standards for backstop, the NSW Government proposes that, when implementing the backstop mechanism, NSW DNSPs will be required to set up and operate Common Smart Inverter Profile - Australia (CSIP-AUS) servers to curtail solar exports to the grid and use a consistent NSW test protocol across all three DNSP servers. CSIP-AUS allows two-way communication and exchange of data between devices (inverters) and the managing body (DNSPs).

NSW further intends to require DNSPs to harmonise their approach in the use of utility servers for the backstop mechanism. Such as, ensuring they do not create additional accreditation and test obligations beyond those currently required in other Australian jurisdictions. This will ensure consistency with existing backstop arrangements for equipment manufacturers.

Use of the Emergency Backstop Mechanism as an emergency measure only

The NSW Government intends to ensure the Emergency Backstop Mechanism will be used as a last resort measure to maintain system security during Minium System Load (MSL) events, to avoid reverse feeder shedding. AEMO has a framework of actions that will be taken prior to the use of the Emergency Backstop Mechanism. This is further detailed in the Conditions of use section below (page 27).

DNSPs will apply the following hierarchy of measures to increase operational load in the grid during MSL events, to avoid reverse feeder shedding.

1. **Hot water load shifting:** adjusting the timing of controlled load hot water systems
2. **Solar export curtailment:** flexibly reducing the volume of solar exports into the grid
3. **Solar disconnection:** preventing solar systems from generating electricity
4. **Emergency voltage management:** increasing power consumption in the grid and disconnecting some non-CSIP-AUS enabled solar inverters

Implementation of the backstop by Spring 2025

As mentioned, AEMO has advised that NSW will require an Emergency Backstop Mechanism to be implemented by Spring 2025. The NSW Government recognises the need to implement the Emergency Backstop Mechanism in a timely manner and intends to meet the implementation deadline advised by AEMO.

Question 1 - Do you support the requirement for NSW DNSPs to harmonise their implementation of the backstop mechanism? If not, please explain why.

Question 2 - Are the scope and timelines for the emergency backstop mechanism feasible? If not, please explain why.

Question 3 – Do you agree with the order of the hierarchy of measures to increase operational load in the grid during MSL events? If not, please explain why.

5 Implementation of an Emergency Backstop Mechanism in NSW

Design elements and responsibilities

An Emergency Backstop Mechanism is likely to be developed using the five key design elements outlined in Table 1.

Table 1 - Design elements of an Emergency Backstop Mechanism

Design element	Purpose	What is required?	Responsible Organisation
1. **Device functionality**	Capability at the customer-site that can carry out the curtailment command.	• Devices and customer installation appropriately set and configured to respond to the curtailment command. • Conformance validation at the time of installation, with process for confirming capability and rectifying non-conformance. • Ongoing conformance monitoring over time, with process identifying and rectifying non-conformance.	• Installers • DNSPs (verification & ongoing monitoring)
2. **Communication protocol**	Method to facilitate communication of instructions to devices and necessary data exchange.	• Agreed upon protocols and data exchange to enable communication of the beginning and end of the shedding period. • Status validation (online/offline, execution of the curtailment command). • Conformance monitoring.	• NSW Government (protocols) • DNSPs (validation & monitoring)
3. **Communication network**	Infrastructure to maintain connectivity between the operator/s and the device, over which the curtailment instruction is sent.	• Sufficiently robust and reliable physical communications medium between scheme operator, devices and any intermediary actors that can be relied upon when required to deliver the curtailment command. • Appropriately configured local fall-back behaviours at the device level if communication is lost for an extended period.	• DNSPs
4. **Management system**	To calculate, distribute, and verify responses to the curtailment command.	• Prediction of the amount of DPV generation (MW) available for curtailment ahead of time to sufficient level of accuracy. • Verification of amount of DPV generation curtailed and visibility (or estimation to	• DNSPs

		sufficient level of accuracy) of the amount of DER generation still operating. • Coordination to ensure distribution network remains within operational limits during curtailment event.	
5. Customer connection agreement	Contractual arrangement allowing for remote interaction with customer owned DPV systems.	• Shedding capability requirements for new DPV installations included within customer connection agreements with the DNSPs (and other parties) at the time of installation.	• DNSPs

The following actions are also crucial to ensure an emergency backstop operates as intended:

- The ability to periodically test and confirm the aggregate response of the entire mechanism.
- The ability to test individual device capability on site.
- Appropriate device-level fall back behaviours in case of communications loss (for example, site gradually reverts to zero exports if communications are lost for a set period)
- Process for assessing compliance with the requirement (both at the time of installation, and ongoing over time) and remediation pathways if non-conformance is identified.
- Clear roles and responsibilities to fulfill all the requirements.

In addition to the above responsibilities AEMO will oversee the use of the Emergency Backstop Mechanism by:

- Identifying the minimum demand thresholds
- Identifying time periods where the minimum demand threshold is at risk of being breached
- Developing procedures for the use of the backstop mechanism, ensuring other lower-impact actions are taken prior (see Conditions of use)

Question 4 – Are the design elements of the backstop mechanisms appropriate and feasible? If not, please identify why and provide any alternative suggestions.

Question 5 – Are the roles and responsibilities of each organisation appropriate and feasible? If not, please explain why and provide any alternative suggestions.

System size

The Emergency Backstop Mechanism using CSIP-AUS will apply to system sizes of 200kW and smaller, aligning with other jurisdictions in the NEM. For larger systems (above 200kW) it is proposed that DNSPs use a management technology most suited to the system as most DNSPs currently have some level of controllability and are working towards standardising their approach, but size thresholds and connection policies vary across the businesses. AEMO has noted that they intend to work with DNSPs to investigate the feasibility of introducing a threshold for real time monitoring and control of solar systems above 200kW in their connection agreements.

Question 6 - Do you support the threshold for backstop mechanism using CSIP-AUS being 200kW and smaller? If not, please provide detail on what threshold you think is appropriate.

I. Do you agree with the approach for systems above 200kW? If not, please explain why and provide any alternative suggestions.

Technical considerations

Setting the correct technical considerations is important to ensure device functionality and to establish the communications protocol for the Emergency Backstop Mechanism (design elements 1 and 2 of Table 1).

The South Australian Emergency Backstop Mechanism relies on agents, aggregators and distribution network operators communicating with customers prior to remote disconnection. South Australia Power Networks (SAPN) approach allows multiple compliance pathways to achieve the desired outcome. The method of disconnection varies according to the degree of smart technology (meter, inverter and communication platform) and its application. Deployment of smart technologies, such as mobile internet connection, also gives aggregators greater monitoring and utilisation control of solar systems and allows them to implement flexible solar exports. SAPN is also increasingly using their Flexible Export mechanism (which uses CSIP-AUS) for backstop. The South Australian Government mandated flexible export capability for all new and upgraded solar installations from 1 July 2023. SAPN is aiming for all areas of its network to have a flexible solar export offerings by January 2025.

The Victorian Emergency Backstop Mechanism relies on DNSPs to set up and operate CSIP-AUS servers to curtail or stop solar exports to the grid. This method requires less government intervention in the operation of the Emergency Backstop Mechanism (i.e., no need for managing agents through a technical regulator). CSIP-AUS allows two-way communication and exchange of data between devices (inverters) and the managing body (DNSPs). As well as enabling the functional requirements for an emergency backstop, CSIP-AUS can also be used to manage DOEs providing customers and networks with more flexible export options and controls.

As with other states, a potential solution for NSW is to require all new DPV installations to be visible, connected, and controllable using CSIP-AUS enabling them to participate in a backstop measure. In Victoria this was done through ministerial orders specifying licencing conditions under the Victorian *Electricity Industry Act 2000*. The same approach could be taken in NSW under the *Electricity Supply Act 1995*, with a new ministerial order, or an amendment of DNSP licence conditions, requiring that DNSPs must only connect or alter connections to the grid if the inverter is backstop compliant (CSIP-AUS, etc). This could also include a requirement that DNSPs implement the necessary measures to control the inverters during times of minimum demand (i.e. when directed to by AEMO) and use a consistent NSW test protocol and interpretation across all three DNSP servers.

This would result in NSW DNSPs being given the power and responsibility to control these systems (as directed by AEMO) in times of minimum demand. New and modified/upgraded systems will be able to be respond to the Emergency Backstop Mechanism and the controllable capacity will grow over time. Older solar PV systems, installed prior to the implementation of a NSW CSIP-AUS backstop mechanism, will not be able to respond in this manner, but would be affected by the use of any emergency voltage management.

AEMO has indicated to NSW DNSPs that experience has shown that DNSPs should plan for:

- 1-2 years to implement basic curtailment capability using CSIP-AUS for a proportion of the DPV fleet, which may involve some level of manual processes
- 2-5 years to:
    - Achieve a high level of operability through building streamlined internal control systems for CSIP-AUS
    - Achieve high levels of compliance through uplifting local solar industry capability, and developing processes to monitor and manage compliance.

Adoption of this standard would align with national work being undertaken as part of the National CER) Roadmap. The Roadmap, which was endorsed by Ministers at the Energy and Climate Ministerial Council (ECMC) in July 2024, includes a priority (T.3) to establish secure communication systems for CER devices which includes the roles, policies, hardware, software and technical requirement of having consistent CER technical standards adopted Australia-wide[13].

If implemented in a holistic manner, these standards could also set a basis for enabling DOEs in NSW. This would allow DNSPs (and retailers) to adjust the amount of energy fed into the grid within a given range. CSIP-AUS would also allow pricing signals to be sent to consumers on when to use or export their solar energy and provide greater consumer control over solar export charges.

Question 7 - Do you have any concerns or insights into using CSIP-AUS compatible inverters and an internet connection to control the backstop mechanism?

Question 8 – Is it appropriate for the emergency backstop mechanism to be implemented using technologies and systems consistent with enabling the future use of flexible export limits? If not, please explain why.

Question 9 – Which, if any, existing test protocols should be considered for implementation as the consistent test protocol for NSW?

Conditions of use

Under the National Electricity Rules (NER) AEMO can direct any registered participant to undertake actions to maintain or re-establish the power system to a secure operating state. The NER also outlines how and when AEMO can declare a contingency event that may impact grid security and the actions it can take to maintain or re-establish power system security.

AEMO's national electricity emergency management arrangements are detailed in the Power System Emergency Management Plan (PSEMP). These arrangements are governed by the National Electricity Market (NEM) Rules, the NEM Emergency Powers Memorandum of Understanding (MoU), and the NEM Emergency Protocol.

During a power system emergency, the PSEMP states that AEMO will:

- Consider the safety of its employees, NEM participants, and the community as its first priority.

[13] National Consumer Energy Resources Roadmap Powering Decarbonised Homes and Communities, ECMC (July 2024), https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf

- Promote a seamless co–operative response from jurisdictional authorities and industry participants.
- Take all reasonable actions to return the power system to a secure operating state.
- Restore electricity generation supply as quickly as possible.
- Ensure power sharing between jurisdictions in accordance with appropriate guidelines.
- Take action as necessary and within the provisions of the NEM Emergency Powers MoU and the NEM Emergency Protocol (available below).

The emergency arrangements outlined in the PSEMP complement each NEM jurisdiction's own power system emergency response arrangements and communications plans.

To manage conditions of low system demand, AEMO collaborated with NSPs to introduce the Minimum System Load framework in 2022[14]. This aims to mirror the Lack of Reserve (LOR) framework[15] (which is used when approaching conditions of inadequate supply to meet demand) and provides to the market on emerging low demand conditions when actions may be required to maintain system security.

Table 2 outlines the actions taken at Minimum System Load (MSL) 1, MSL 2 and MSL 3 levels. Demand falling below these thresholds may be identified in forecast timeframes (week ahead, day ahead or hours ahead), or could arise suddenly in response to a contingency event or unplanned outage. If management actions are required, these will be directed at the latest time to intervene, so decisions can be based on the latest available forecast. Aligned with standard practices, AEMO will provide market notices to inform market participants if these conditions are forecast or occurring[16].

Table 1 - Minimum System Load (MSL) framework

Condition	Actions
MSL 1	Notify the market, monitor the situation.
MSL 2	Take preparatory actions required to land satisfactory and return to secure within 30 minutes following a credible load contingency. This might include: • Recalling transmission line outages. • Moving to smaller synchronous unit combinations to deliver essential system services. • Constraining or directing any non-essential generating units to decommit (including scheduled, semi-scheduled, non-scheduled and exempt generators), if they have not already self-curtailed in response to low or negative market prices. • Ensuring availability of adequate frequency reserves. • Preparing necessary measures to ensure the system can be resecured within 30 minutes following a credible contingency.
MSL 3	System security violations related to low demand are occurring or forecast to occur at this level.

[14] AEMO's new market signal to improve transparency and system security, AEMO (Sept 2021), https://aemo.com.au/newsroom/media-release/aemos-new-market-signal-to-improve-transparency-and-system-security

[15] Fact sheet: Lack of Reserve (LOR) notices, AEMO (2023), https://aemo.com.au/en/learn/energy-explained/fact-sheets/lack-of-reserve-notices

[16] MSL and DPVC Market Notices – FAQs, AEMO (2021), https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/cmsl-faqs.pdf?la=en

	Direct NSPs to restore regional demand to the thresholds required. This may require use of emergency backstop capabilities.

In their submission to Victoria's emergency backstop consultation[17], AEMO stated that they anticipate the need for DPV curtailment to manage minimum system load would occur only in rare periods where there is coincident:

- mild weather and clear sky periods on weekends or public holidays, with low underlying demand and high DPV generation, resulting in low operational demand
- abnormal system conditions with coincident network or unit outages restricting power flow between regions, regions islanded or at credible risk of separation.

Under these rare but plausible conditions, if is foreseeable that there could be no other way to operate the system securely except for reducing generation from DPV.

In their Fact Sheet: Operating electricity grids with high rooftop solar AEMO states that rooftop solar management is a last resort action, which would only be used when all other options are exhausted. AEMO undertakes a range of 'system level' actions to maintain security before and during an DPV contingency or minimum system load event, including:

- Issuing market notifications on the forecast level of risk to secure a market response (Table 2).
- Recalling planned transmission outages.
- Constraining and directing non-essential grid-scale generation.
- Increasing electricity demand by directing large consumers into service to absorb excess energy, such as pumped hydro or batteries.

In most circumstances, the above actions will prevent the need for any solar management. Examples of the actions that AEMO would take in Victoria for MSL events are outlined in their Victorian Minimum System Load Procedure Overview publication.

Question 10 – Do you think the conditions under which the emergency backstop mechanism could be used are appropriate? If not, why? Please suggest any alternative conditions that should be considered.

Implementation pathway

Based on outcomes in other jurisdictions, and assessment of technical options, it is considered implementation through variation of NSW DNSP licence conditions is the preferred implementation mechanism. This would require DNSPs to:

- Provide appropriate terms within connection agreements for new and replacement solar inverters that support the curtailment of solar exports.
- Enable a robust Emergency Backstop Mechanism through CSIP-AUS and operate the mechanism when directed by AEMO.

[17] Victoria's emergency backstop mechanism for rooftop solar, AEMO (2023), https://engage.vic.gov.au/download/document/33212

- Provide AEMO with operational insights such as predictions of the amount of DPV generation (MW) available for curtailment ahead of time to sufficient level of accuracy.
- Harmonise their approach to implementing a CSIP-AUS enabled emergency backstop.
- Report on compliance and capacity of CSIP-AUS compliant systems, including implementing a conformance monitoring framework where emergency backstop devices remain enabled, and whether they are capable of activating the backstop.
- Report to the Minister on the performance and effectiveness of the Emergency Backstop Mechanism when directed to be activated by AEMO.

It is anticipated that distribution businesses would formalise these requirements through their connection agreements with their customers.

Question 11 – Do you have any views on the proposed implementation pathway (variation of DNSP licencing condtitions)?

Question 12 – What information will manufacturers, installers, customers and distribution networks require to understand the changes to implement the backstop mechanism?

I. Who is best placed to communicate this information to the different audiences?

II. How should this information be best communicated to the different audiences?

6 The NSW CER Installer Portal

A CER Installer Portal will make it easier for installers to install CER devices. This will improve visibility of CER, ensure correct installation and allow for better integration of renewable energy in the NSW energy grid.

The NSW Government is developing a CER Installer Portal to improve compliance with standards at the point of installation of CER.

The CER Installer Portal will streamline processes for CER installers, improve compliance with key standards and processes, and provide valuable data on CER installations in NSW. The Portal will also facilitate the registration and testing of installed CER devices with all three NSW Distribution Network Service Providers (DNSP) utility servers, supporting an Emergency Backstop Mechanism in NSW by Spring 2025.

NSW DCCEEW has worked closely with NSW DNSPs to develop a model to deliver the CER Installer Portal to meet emergency backstop timelines. The initial Portal model for Spring 2025 will be an integrated DNSP and NSW Government solution. Applications to connect to the network will continue to be hosted by the three DNSPs connection portals, with seamless integration and data sharing with the NSW CER Installer Portal for the installation of CER. Further improvements and expansions of the CER Installer Portal will be considered for 2026.

The NSW CER Installer Portal is based on the functionality of the South Australian Power Network (SAPN) Smart SA system.

Technology the Portal will capture

One of the key objectives of the CER Installer Portal is to improve visibility of CER for DNSPs, government and other market bodies. Improved visibility of where CER is installed, and the settings of CER devices can enable DNSPs and market bodies to better manage the energy generated by these technologies. This will allow more of the renewable energy generated by households and businesses into the energy mix.

The CER Installer Portal could mirror the technology captured by the AEMO DER register. The AEMO DER Register is a database of information about DER devices installed on-site at a residential or business location across the NEM. The AEMO DER Register currently captures records of small grid-connected generating systems totalling up to 30 MW at a premises, including:

- Solar photovoltaic (PV) systems, whether on the building or the ground
- Battery Energy Storage Systems (BESS)
- Small wind turbines
- Small hydro-electric turbines
- Other renewable energy generating systems
- Gas turbines
- Diesel or petrol generators (grid-connected)
- Electric vehicles configured with Vehicle-to-Home/Vehicle-to-Grid capability.

Similarly, SAPN's SmartInstall Portal supports the installation of small (up to 30kVA) embedded, inverter-based generation.

As noted in Chapter 5 'System Size', the Emergency Backstop Mechanism using CSIP-AUS will apply to system sizes of 200kW and smaller, aligning with other jurisdictions in the NEM. The CER Installer Portal could align to the requirements of the backstop. However, this may mean that DNSPs require a separate installation process for systems larger than this size, which could result in additional requirements for installers.

Question 13 – What CER should the NSW CER Installer Portal capture? Please explain the reasoning behind your answers.

I. What types of technology?

II. What size (capacity) of technology?

III. What technology should be excluded? Why?

IV. Should the Portal align with the Emergency Backstop Mechanism in capturing only systems under 200kW?

V. Should the Portal capture technology consistent with that recorded in AEMO's DER register? Is there additional technology that should be captured?

The Portal will introduce features to improve CER installs

Installers of CER in NSW play a crucial role in providing visibility of the CER they are installing for networks, market bodies, government and other groups.

The Portal aims to make installation processes easier for installers to provide this critical information and register devices into DNSP systems at the point of installation. The Portal will introduce a range of features to improve the installation of CER.

Integrate with DNSP connection portals

The NSW Government CER Installer Portal will seamlessly integrate with DNSP connection portals to collect and pre-fill application information already submitted into the DNSP connection portal. Installers will be able to search and access application data to complete installations. This will reduce the duplication of information to be provided, saving time for installers.

Capture critical information about CER devices

The Portal will allow installers to provide technical information about CER devices they are installing, such as serial numbers, when they close out (complete) an installation. The Portal will accessible across different devices including smart phones and tablets so that information can be submitted on site.

Register and test devices for emergency backstop

The Portal will be developed with DNSPs to ensure capability testing of devices. While on site, installers will be able to test whether the installed device can communicate with DNSP systems and allow remote curtailment or disconnection of energy generation. The Portal will provide a single touch point for installers to register devices into the backstop across all three DNSPs.

This function will be critical for enabling the Emergency Backstop Mechanism and allow DNSPs to better manage the renewable energy being exported to the grid. This same technology can be used to enable flexible exports into the future.

Amend and update records

The Portal will allow CER installers to amend records where appropriate under a range of different scenarios, ensuring data about devices installed at a site is correct and up to date.

Provide CER data to the government and market bodies directly

The Portal will simplify processes for installers by collecting all the information required about an installation in one place. The Portal will then submit key compliance information directly to government bodies on behalf of installers, including the Certificate of Compliance of Electrical Works (CCEW) and the AEMO's Distributed Energy Resources Register. This will make it easier for installers to provide the required information efficiently to save time and resources.

Improving compliance with key standards

The Portal will include automated compliance and enforcement functionality throughout the end-to-end connection and installation process. This includes mandatory data entry fields, automated checking, device capability testing, in portal notifications if requirements are not met and inability to progress in the user journey if data entered does not comply.

NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) is working with DNSPs to develop compliance and enforcement features in the portal. The Portal is currently proposed to mirror the SAPN SmartInstall Portal enforcement feature, which sends warning notifications to who that made the application to connect the CER to alert them that their CER has not been installed in accordance with correct standards and processes. These warnings provide an opportunity for the applicant to ensure the installer they engaged resolves any compliance issues.

Where there is consistent non-compliance that has not been rectified, the SAPN Portal prevents the party who made the application making a further application to connect to the network through the Portal until compliance improves. This function is intended to be used as a last resort measure to prevent high levels of non-compliance.

Question 14 – Do you support the functions outlined for inclusion in the CER Installer Portal? If not, please explain why.

Question 15 – Are there any additional functions you would like to see included within a CER Installer Portal?

Question 16 – Are there additional ways that the Portal should be designed to support installers?

Question 17 – Do you agree that the party that applies for a CER connection should be responsible for ensuring the installers they have engaged rectify non-compliance? If not, please explain why.

Question 18 – Do you have any other views on compliance and enforcement within the Portal?

The Portal is designed for installers

The Portal is proposed to be designed in a way that makes processes easier for installers, DNSPs, government and market bodies. DCCEEW proposes the following principles for design of the Portal to achieve this.

Accessible and easy to use

The CER Installer Portal will be made accessible for all potential users, including those with disabilities.

It will be accessible across different devices and platforms to enable user access via a computer and on a mobile device or tablet so that information can be submitted by installers on site.

The Portal will also automate as much as possible, to save installers time in installations and improve accuracy of data.

Interoperability

Interoperability is the ability of different IT systems, devices and software applications to use two-way communication and to use and exchange data accurately. Currently, there is no common system in NSW that enables CER devices to connect to and communicate via the internet.

The Portal will ensure that CER devices can communicate with DNSP systems for the first time via the internet. This will enable the Emergency Backstop Mechanism as well as make it easier for data about CER to be shared with the bodies who need it.

Performance

The objective of the Portal's design will be to provide a fast and reliable service for installers when and how they need it.

Security

Security of data in the Portal will be prioritised in all elements of the Portal design, to ensure that only those authorised to access data can access it.

Flexible design

The Portal will be designed to allow for new functionality to be added in the future, to allow us to continue to improve the Portal over time.

Question 19 – Are there additional ways that the Portal should be designed to support installers?

7 Implementation of the Portal in NSW

The CER Installer Portal will be available by Spring 2025

The Portal will be developed in two phases, to ensure the functionality required to enable the emergency backstop is developed by Spring 2025.

- Phase 1: This phase will see DNSPs work with DCCEEW to develop and implement a common NSW Government CER Installer Portal by Spring 2025. DNSPs will retain their existing connections portals, and these will be seamlessly integrated into the new CER Installer Portal.
- Phase 2: Expansion of NSW Government Installer Portal to include additional functionality. NSW Government DNSPs will align and improve the connections applications processes.

This phased approach has been taken to allow for implementation of the Emergency Backstop Mechanism by Spring 2025, which is essential to ensuring grid reliability:

- The installation processes include processes that are critical to the delivery of the emergency backstop, these have been prioritised to meet the emergency backstop timeline of Spring 2025.
- The installation processes currently do not exist and hold the most value for improving compliance with standards. In contrast, each DNSP has an existing portal and process for applications to connect CER to the network.
- Our initial scoping research has found that applications for connections are typically done by a different user than the installation, so having different portals for these stages is unlikely to result in a disjointed user experience for most users.

Question 20 – Do you agree with the phased approach proposed for the delivery of the Portal? If not, please explain why.

Question 21 – Do you think that there are any functions that should be included or excluded from the first phase of the Portal development?

Stakeholder collaboration to deliver the Portal

The NSW CER Installer Portal Project will be a collaborative effort between NSW DCCEEW and the three NSW DNSPs to deliver the portal development, industry implementation, stakeholder change management, and associated tasks required.

The NSW Government has worked closely with DNSPs to date to develop high-level plans about how roles and responsibilities will be allocated between the organisations. These high-level responsibilities between these parties are outlined below.

Digital development

- DNSPs will develop and maintain an appropriate connections portal with design features to support the CER Installer Portal.
- DNSPs will develop and maintain a backend database to receive information from Connections Portal and Installer Portal.

- DCCEEW will develop and maintain the CER Installer Portal which facilitates the functions outlined in the chapter above.
- DNSPs will develop and maintain systems to enable the registration and testing of CER devices, and the remote control of these devices, to integrate into the CER Installer Portal.
- DCCEEW and DNSPs will contribute to the development of integrations between these systems.

Project management, compliance, stakeholder engagement and training

- DCCEEW will be responsible for overall project management and governance. DCCEEW will collaborate closely with DNSPs in working group meetings and via other communication channels.
- DNSPs will continue to monitor compliance of CER installs as per their current arrangements.
- DNSPs will primarily be responsible for providing technical and customer support for installers, except where the issue relates to DCCEEW-owned systems.
- DCCEEW will continue to consider opportunities to boost compliance and enforcement as part of the Consumer Energy Strategy.
- DNSPs and DCCEEW will be jointly responsible for stakeholder engagement with industry as part of the development and deployment of the Portal.
- DNSPs and DCCEEW will be jointly responsible for developing and delivering training materials for industry for changed processes for the DNSP connection and installer portals. Some training may be delivered through the Portal itself.

Building on the progress of Endeavour Energy

Endeavour Energy intended to develop an end-to-end portal based on the SAPN model to deliver the Emergency Backstop Mechanism by Spring 2025, and flexible export trials in the future. The NSW Government is working closely with Endeavour Energy, to make the most of the progress that Endeavour Energy already made on its portal.

Capitalising on the progress made by Endeavour Energy will allow the NSW Government to fast track the development of the CER Installer Portal, while also ensuring a harmonised NSW approach. This will minimise the possibility of delays to the portal that could impact upon the timing of the backstop mechanism.

Question 22 – Do you support the proposed joint NSW Government-DNSP delivery of the CER Installer Portal? If not, please explain why.

Keeping stakeholders informed

Portal delivery model

NSW DCCEEW DNSPs and other stakeholders are aligned on methods to resolve concerns around non-compliance with processes and standards at the point of installation of CER since 2023.

DCCEEW consulted with more than 80 stakeholders in two phases of consultation on the development of the Consumer Energy Strategy from February to May 2024. This included:

- gas and electricity networks

- industry
- industry bodies/associations/peak bodies
- retailers
- consumer and environmental groups
- market and government bodies
- research/education organisations.

Multiple submissions to the Consumer Energy Strategy recommended the introduction of a smart compliance digital solution, based on South Australian Power Networks' (SAPN) SmartApply and SmartInstall programs.

Following the release of the NSW CES in September 2024, DCCEEW initiated discussions with the three NSW DNSPs to determine how best to proceed in the implementation of Action 37. In late October 2024, DCCEEW issued a draft options paper to DNSPs with an initial proposal of project delivery and timeline of work.

DCCEEW worked with DNSPs to further develop their proposal, and DNSPs have expressed in principle support for the approach.

Engagement with installers for design and launch of the Portal

The NSW Government will work with DNSPs to develop a comprehensive plan to engage with industry, in particular CER installers, in the development of the Portal. This engagement will build on the initial engagement that Endeavour Energy has already completed with installers for their proposed Portal. The functions proposed by Endeavour Energy in these initial conversations are largely the same as those proposed in the NSW Government CER Installer Portal.

This public consultation paper represents the first stage in consultation on the Portal. This will be followed by a series of dedicated workshopping sessions with installers and other stakeholders to inform the design of the Portal. We will also test functionality of the Portal with selected installers and other stakeholders to ensure it meets their needs before launch.

The NSW Government will also work with DNSPs to develop resources and training for installers in the lead up to the launch of the Portal and will provide a dedicated team to respond to issues initially following the Portal roll out.

Question 23 – What information will installers and any other stakeholders require to support the roll out of the CER Installer Portal?

I. Who is best placed to provide this information?

II. What are the best ways of communicating this information to stakeholders?

Consultation questions

Question 1 - Do you support the requirement for NSW DNSPs to harmonise their implementation of the backstop mechanism? If not, please explain why.

Question 2 - Are the scope and timelines for the Emergency Backstop Mechanism feasible? If not, please explain why.

Question 3 – Do you agree with the order of the hierarchy of measures to increase load in the grid during MSL events? If not, please explain why.

Question 4 – Are the design elements of the Emergency Backstop Mechanism appropriate and feasible? If not, please identify why and provide any alternative suggestions.

Question 5 – Are the roles and responsibilities of each organisation appropriate and feasible? If not, please identify why and provide any alternative suggestions.

Question 6 - Do you support the threshold for the Emergency Backstop Mechanism using CSIP-AUS being 200kW and smaller? If not, please provide detail on what threshold you think is appropriate.

I. Do you agree with the approach for systems above 200kW? If not, please explain why and provide any alternative suggestions.

Question 7 - Do you have any concerns or insights into using CSIP-AUS compatible inverters and an internet connection to control the backstop mechanism?

Question 8 – Is it appropriate for the Emergency Backstop Mechanism to be implemented using technologies and systems consistent with enabling the future use of flexible export limits? If not, please explain why.

Question 9 – Which, if any, existing test protocols should be considered for implementation as the consistent test protocol for NSW?

Question 10 – Do you think the conditions under which the Emergency Backstop Mechanism could be used are appropriate? If not, why? Please suggest any alternative conditions that should be considered.

Question 11 – Do you have any views on the proposed implementation pathway (variation of DNSP licencing conditions) or alternatives?

Question 12 – What information will manufacturers, installers, customers and distribution networks require to implement the Emergency Backstop Mechanism?

I. Who is best placed to communicate this information to the different audiences?

II. How should this information be best communicated to the different audiences?

Question 13 – What CER should the Portal capture? Please explain the reasoning behind your answers.

I. What types of technology?

II. What size (capacity) of technology?

III. What technology should be excluded? Why?

IV. Should the Portal align with the Emergency Backstop Mechanism in capturing only systems under 200kW?

V. Should the Portal capture technology consistent with that recorded in AEMO's DER register? Is there additional technology that should be captured?

Question 14 – Do you support the functions outlined for inclusion in the CER Installer Portal? If not, please explain why.

Question 15 – Are there any additional functions you would like to see included within a CER Installer Portal?

Question 16 – Are there additional ways that the Portal should be designed to support installers?

Question 17 – Do you agree that the party that applies for a CER connection should be responsible for ensuring the installers they have engaged rectify non-compliance? If not, please explain why.

Question 18 – Do you have any other views on compliance and enforcement within the Portal?

Question 19 – Are there additional ways that the Portal should be designed to support installers?

Question 20 – Do you agree with the phased approach proposed for the delivery of the Portal? If not, please explain why.

Question 21 – Do you think that there are any functions that should be included or excluded from the first phase of the Portal development?

Question 22 – Do you support the proposed joint NSW Government-DNSP delivery of the CER Installer Portal? If not, please explain why.

Question 23 – What information will installers and any other stakeholders require to support the roll out of the CER Installer Portal?

I. Who is best placed to provide this information?

II. What are the best ways of communicating this information to stakeholders?

List of Acronyms

Acronym	Full name
AEMO	Australian Energy Market Operator
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulatory
CCEW	Certificate of Compliance of Electrical Works
CER	Consumer Energy Resources
CSIP-AUS	Common Smart Inverter Profile - Australia
DNSP	Distributed Network Service Provider
DPV	Distributed photovoltaics
ECMC	Energy and Climate Change Ministerial Council
ESS	Energy Savings Scheme
EV	Electric Vehicle
kVa	Kilovolt-ampere
kW	Kilowatt
kWh	Kilowatt-hour
LoR	Lack of Reserve
MSL	Minimum System Load
MW	Megawatt
MWh	Megawatt-hour
NSW	New South Wales
NEM	National Electricity Market
NER	National Electricity Rules
PDRS	Peak Demand Reduction Scheme
SA	South Australia
VPP	Virtual Power Plant

Appendix

Table 3: Summary of CER Installer Portal functionality to be developed by Spring 2025.

Function	Description	Purpose
Pre-fill of information from DNSP connections portals	CER installers will be able to search and access application data using a unique identifier to complete commissioning and close out.	Integrate the DNSP application portals with the DCCEEW Installer Portal. Reduce duplication of installer user effort and provide a seamless user experience.
CER installation close out	CER installers to record critical information (particularly serial numbers) when closing out of their installation.	Provide critical information to DNSPs and DCCEEW. Improve compliance with CCEW, DER register and other legislative requirements which use this information.
Enrolling and testing inverters onto DNSP systems	The Portal will facilitate the registration of devices with the DNSPs systems, and test the devices are able to be operated remotely.	Enrol devices into the DNSP utility servers and ensure they are interoperable Develop NSW backstop and flexible exports capacity
Ability to amend and update portal CER records	CER installers/DNSPs to be amend records where CER has been recorded incorrectly in portal, or where incorrect information has been supplied previously.	To correct errors in previous CER information capture To ensure CER information is up to date
Automated AEMO DER registration	Integrate with the AEMO DER Register to record and update installation records	Improve compliance with the DER Register Provide greater information about CER in NSW to AEMO
Integrated CCEW form submission	Integrate submission of CCEW to NSW Government by installer in conjunction with commissioning of CER.	Improve compliance and make it easier for installers to fill out the CCEW and reduce the amount of times information is provided to government.
Compliance and enforcement mechanism.	Portal to include a warning and lock out functions for users that are consistently non-compliant.	To improve compliance with technical standards and other requirements through the portal