

Solar product technical specification

A technical specification for efficient and
demand flexible solar systems

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Version 1.3

This revised version was published in July 2026 to include a minor amendment to the inverter standby power clause and maximum output of inverters.

Background and purpose

EECA's mission is to mobilise New Zealanders to be world leaders in clean and clever energy use, and as part of this EECA has a strategic focus to [accelerate renewable energy](#).

The uptake of renewable energy can support energy security and energy affordability. One form of renewable energy is solar, which contains two main components - photovoltaic panels and an inverter, which can also be paired with batteries.

[EECA research has shown](#) customers frequently report being overwhelmed by conflicting or overly technical information. Trust in sources is a major concern, not just in the messenger but whether information is current. Independent, neutral information is highly valued and can be difficult to find. There is a need for clearer, more accessible, and up-to-date content tailored to individual circumstances that supports customers at each stage of the journey.

For solar products, it is important that solar systems provide a minimum level of performance and are future proofed as they are expected to have a long lifetime (20 years+).

[Demand flexibility](#) has the potential to increase energy security, reduce consumer costs, and support the energy transition to more intermittent renewable generation (e.g. solar and wind).

To support the uptake of demand flexible solar, EECA has developed this technical specification which can be used to determine products that meet a minimum level of performance for energy efficiency and demand flexibility.

This specification does not replace the requirement for solar system to meet all legal requirements to be supplied and installed included relevant components of the [Building Act 2004](#), [Building Regulations 1992 \(The Building code\)](#), [Electricity \(Safety\) Regulations 2010](#), [Electricity Act 1992](#), [Wiring Rules](#), [Electricity Industry Participation Code 2010](#), and any other requirements.

Scope

The specification is intended to cover efficiency and demand flexibility, but not other aspects such as safety.

It covers PV panels, inverters, and batteries specifically designed for solar systems.

The specification covers inverters in three-phase or single-phase configuration. It covers string inverters, micro-inverters, and optimised inverters. It also includes grid-tied inverters, inverters, hybrid inverters, and grid-forming inverters. Also, inverters for batteries.

The specification covers batteries modules, and integrated battery systems. It includes lithium-based batteries but excludes lead-acid.

Definitions

IEC 61215 2021 series refers to:

- IEC 61215.1 2021: Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements, and
- IEC 61215.2 2021: Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures, and
- IEC 61215-1-1:2021: Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) modules.

EN 50530:2010 refers to EN 50530:2010 + A1: Overall efficiency of grid connected photovoltaic inverters.

AS/NZS 4777.2:2020 refers to AS/NZS 4777.2:2020 + A1 + A2: Grid connection of energy systems via inverters, Part 2: Inverter requirements.

IEC 62933-2-1:2017 refers to IEC 62933-2-1:2017: Electrical energy storage (EES) systems - Part 2-1: Unit parameters and testing methods - General specification.

Revisions to specifications

The specification will evolve over time as technology and standards develop. Any revision to the specification will have a suitable transition period. EECA welcomes feedback on the specification, which can be sent to star@eeeca.govt.nz.

Specification

The specification below is based on Table B2 Key component-specific installation requirements in [NZ PAS 6014:2025 Residential solar photovoltaics \(PV\) and battery storage systems guideline](#).

It has also considered alignment with requirements in Australia such as the Clean Energy Council (CEC) Solar product programme: [Products | Clean Energy Council](#).

Photovoltaic panels

Panels are key in solar systems as they are the main components which convert light into electricity, are installed on roofs, and have a very long life (20 years+).

Area	Requirement	Method to show compliance
Suitability for long-term operation in open-air climates	Meet the requirements of IEC:61215 2021 series.	On the CEC approved PV modules list , or a test report to the IEC 61215:2021 series.

Inverters

The inverter specification below covers inverters used for solar PV, and/or batteries.

Area	Requirement	Method to show compliance
Efficiency for photovoltaic inverters*	Weighted efficiency of at least $\geq 94\%$, using the method in EN 50530:2010.	Test report to EN 50530:2010.
Standby power (e.g. passive standby, idle, no-load or night-mode).	10W or less.	Standby power measurement
Interoperability	• Uses IEEE 2030.5 (2018 or newer) or OpenADR (2.0 or newer). Can be ○ On-board the inverter, or ○ A separate device supplied with the inverter, or ○ Through a cloud-based server where the inverter communicates with the server (using any protocol), and the external party communicates with the server using IEEE 2030.5 or OpenADR. • Has Wi-Fi connectivity (IEEE 802.11). • All supporting keys etc. are supplied with the inverter and only connection during installation is required to enable a remote agent to control it.	Product documentation showing how communication is completed including the product response and measurement, or is on the CEC approved inverter list with Software Communication Client listed (showing IEEE 2030.5 CSIP-AUS compliance) .
Product response	The following can be met by meeting the applicable Demand Response Mode (DRM) in AS/NZS 4777.2:2020, or	Test report to AS/NZS 4777.2:2020 showing compliance with applicable DRM modes, or test results

	through other means e.g. direct control rather than demand response mode. • Generation: ○ Do not generate power (AS/NZS 4777.2:2020, DRM 5), ○ Decrease power generation/set limit (AS/NZS 4777.2:2020, DRM 6, DRM 7), ○ Increase power generation (AS/NZS 4777.2:2020, DRM 8). • Consumption (if applicable, e.g. charging a battery or providing power to a DC load): ○ Do not consume power (AS/NZS 4777.2:2020, DRM 1), ○ Decrease power consumption/set limit (AS/NZS 4777.2:2020, DRM 2, DRM 3), ○ Increase power consumption (AS/NZS 4777.2:2020, DRM 4).	showing functionality, or is on the CEC approved inverter list with Software Communication Client listed (showing IEEE 2030.5 CSIP-AUS compliance).
Measurement	• Voltage, • Frequency, • Active power, • Reactive power, • Apparent power, • Measure or calculate the electricity imported (consumed) and exported and the time with visibility to the owner of this information or their authorised agent.	Test report to AS/NZS 4777.2:2020 showing compliance, or test results showing functionality or is on the CEC approved inverter list with Software Communication Client listed (showing IEEE 2030.5 CSIP-AUS compliance).
Cyber security	SNZ PAS 6014:2025	Declaration.
Home Energy Management System integration	Uses one or more of the following IP protocols: • REST API, • MQTT, • Modbus, • KNX, • Matter.	Product documentation.

*A photovoltaic inverter is one which is designed to take power from photovoltaic cells and convert it to AC. There are also hybrid inverters which work with batteries.

Batteries

Area	Requirement	Method to show compliance
Efficiency of a battery without	Round-trip efficiency $\geq 85\%$.	Test report to IEC 62933-2-1:2017, or equivalent.

an integrated inverterⁱ		
Or, efficiency of a battery with an integrated inverterⁱⁱ	Round-trip efficiency $\geq 80\%$.	Test report to IEC 62933-2-1:2017, or equivalent.
Degradation	At least 60% of new usable capacity after 3,000 cycles with at least 70% depth of discharge e.g. 20% to 90%, or 30% to 100%, etc.	Product warranty information based on test information.
Measurement	Ability to report: • State of charge, • Current maximum usable capacity, • Battery set mode e.g. self-consume, peak-shaving.	Product documentation.
Product response	Ability to set: • Minimum state of charge, • Maximum state of charge. • Operating mode.	Product documentation.

ⁱ Efficiency for standalone batteries.

ⁱⁱ Efficiency for batteries with an integrated, or in-built, inverter housed in the same unit.
If the battery has an integrated inverter, then this inverter must also comply with the inverter requirements as above.