

ACMA compliance priority 2019–20

Interference and licensing compliance— solar inverters

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Executive summary

The purpose of this compliance priority was to mitigate the increased risk of interference to domestic radio and television services arising from the supply of non-compliant solar technology.

A solar inverter is part of a solar electricity system and is the device that turns power from the solar panels into usable power.¹ Solar inverters are often the most complex part of a solar system. Solar inverters were a source of interest as a compliance priority in 2019–20 because the supply of solar panels was expanding in the Australian market, supported by government subsidy schemes for solar installations.

In March 2020, we undertook an audit of solar industry compliance with equipment standards and labelling notices regarding:

- > Electromagnetic compatibility (EMC)—radio emissions that may cause interference, disruption, or disturbance to other devices or to radiocommunications services.
- > Electromagnetic energy (EME)—radiofrequency electromagnetic energy produced when using low-level radio waves to send and receive information.
- > Radiocommunications equipment standards applicable to radio transmitters and receivers.

In examining the solar inverter market, we limited the scope of our audit to suppliers on the Clean Energy Council's approved inverter list, as they met mandatory requirements to claim the solar rebate in a number of states. From the 66 suppliers registered with the Clean Energy Council (CEC), 19 were selected for audit, based on product popularity, methods of distribution or other device supply characteristics. Each supplier was required to produce compliance records for up to five devices. A total of 50 solar inverter devices were examined.

The results indicated that suppliers have a good understanding of the requirements concerning electrical safety and compatibility. However, the audit also revealed an overall lack of supplier awareness around the need for compliance with the EME labelling requirements when the solar inverters were incorporated with a radiocommunications transmitter such as wi-fi, Bluetooth and/or a 3G/4G modem.

Corrective actions taken by the non-compliant suppliers were accepted, however, due to the inability to demonstrate compliance at the time of the audit, seven suppliers were issued with a warning notice under the *Radiocommunications Act 1992*.

¹ A solar inverter converts the variable direct current (DC) output of a photovoltaic (PV) solar panel into alternating 240V current (AC). This AC electricity can be fed into a commercial electrical grid or used by a local, off-grid electrical network.

To improve the education and awareness of the industry, the ACMA has actively engaged with the peak body of the solar industry, the CEC, to disseminate updated regulatory information to its members. The CEC has adopted measures to improve the awareness and compliance of its members with the regulatory arrangements and now includes EME regulatory information on its [website](#).²

Similar to audit programs conducted by the ACMA in recent years, the overall objectives of this compliance priority were to:

- > raise awareness in the solar industry about EME labelling compliance requirements
- > take enforcement actions to resolve any non-compliance concerns
- > build public confidence in the equipment standard and labelling regime, particularly as applicable to solar inverters.

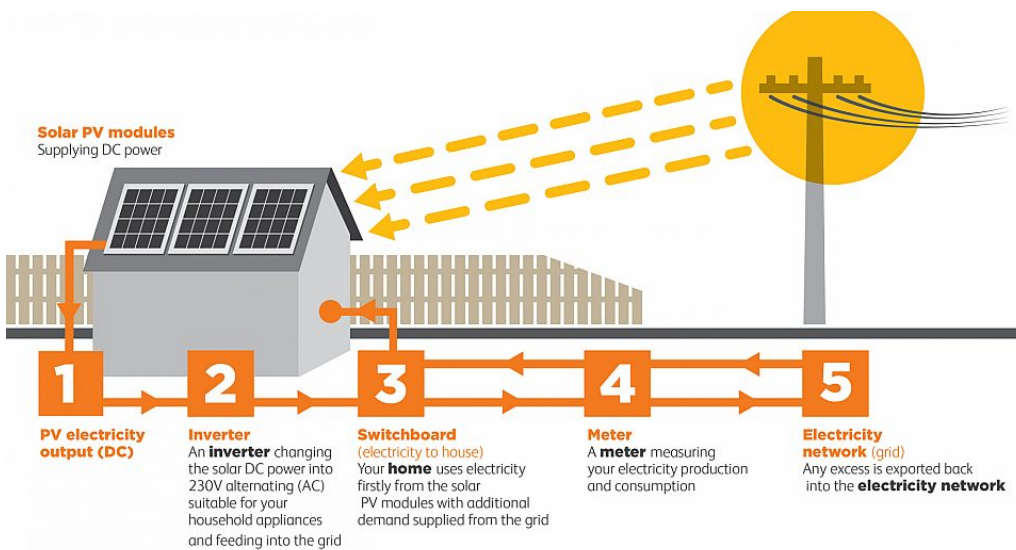
The objectives have been met, with enhanced industry education and awareness of the regulatory arrangements facilitated through the CEC.

² To apply to have an inverter included on the CEC's approved products list, suppliers are now prompted to consider the ACMA's requirements as a first step.

Background

How solar works

Solar systems generate energy from sunlight during the day. The solar panels convert sunlight into DC electricity, which is then converted into usable AC power by the solar inverter. Appliances can use this power instead of drawing power from the electricity grid. Any unused electricity generated by the solar system is fed into the public grid or battery storage.



Source: Clean Energy Council.

Purpose

The purpose of this compliance priority was to mitigate the increased risk of supply of non-compliant solar inverters—which would cause interference to domestic radio and television services—arising from the expansion of government subsidies for solar installations.

Compliance with equipment standards and labelling requirements prevents devices inadvertently causing interference from out-of-band operation or overpowered emissions. The ACMA has routinely audited radiocommunications devices for compliance with these standards.

Solar inverters were a compliance priority in the 2019–20 financial year, as the ACMA became aware that solar rebates were being reinvigorated in some states (particularly Victoria). Experience suggested that in these circumstances there was a risk that low-cost, non-compliant products may enter the Australian market, causing interference to other radiocommunications devices.

The ACMA last conducted a dedicated solar inverter audit program of work in 2010 and found high levels of compliance, with most issues administrative in nature. Since then, significant changes to the regulatory landscape have occurred, in particular:

- > The introduction of a national shared database of suppliers with the Electrical Regulatory Authorities Council (ERAC) on 1 March 2013.
- > Maturation of the clean energy industry, including the emergence of the CEC.

- > Technological advancement in solar inverter products, with more devices now equipped with radiocommunications connectivity (e.g. wi-fi, Bluetooth and potentially 3G/4G capabilities). These require suppliers to produce test reports demonstrating compliance to radiocommunications standards beyond electromagnetic compatibility.

Electromagnetic compatibility (EMC)

The ACMA has prescribed EMC rules to manage the risk of unintended radio emissions that may cause interference, disruption or disturbance to other devices or to radiocommunications services. The rules are set out in the [Radiocommunications Labelling \(Electromagnetic Compatibility\) Notice 2017](#) (EMC LN).

As is the case with suppliers of most common household products (e.g. white goods, kitchen appliances and IT equipment), solar inverter suppliers in Australia are required to ensure that the products they supply are compliant with the relevant EMC requirements and the Australia/NZ standards. They must also be labelled with the Regulatory Compliance Mark when supplying in the Australian market. The Australia/NZ standards are in large parts similar or identical to European standards.

Electromagnetic radiation (EME)

Solar inverters with radiocommunication capabilities use low-level radio waves to send and receive information. Radiofrequency (RF) electromagnetic energy, known as EME, is a product of these radio signals.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) sets limits for exposure to EME. These limits are designed to protect people and are set well below levels that are known to cause harm.

It is the ACMA's role to regulate communications equipment and devices that emit EME.

Where radio transmitters with an integral antenna are incorporated into a solar inverter device, suppliers must maintain and produce upon request test reports that meet the requirements set out in the [Radiocommunications \(Compliance Labelling - Electromagnetic Radiation\) Notice 2014](#) (EME LN) and [Radiocommunications \(Electromagnetic Radiation-Human Exposure\) Standard 2014](#) (RLN).

Solar inverters that can connect to the Australian public mobile telecommunications network are also required to demonstrate compliance with the [Telecommunications \(Labelling Notice for Customer Equipment and Customer Cabling\) Instrument 2015](#) (TLN).

The audit activity was undertaken to determine whether the suppliers were meeting their obligations to obtain and hold the required test reports and other compliance documentation and appropriately label the devices under the relevant legislation. It was not the aim of this audit to examine the veracity of the test reports (both EMC and EME) produced by the participating suppliers for the purpose of this compliance program.

Since July 2013, the ACMA has conducted supplier audits under compliance programs to address community concerns around EME compliance. The 2019–20 solar inverter audit program followed a similar model to these programs.

Methodology

Identification of suppliers and products for audit

For the purpose of this audit activity, all selected solar inverter suppliers were registered on the CEC database. CEC registration was a relevant consideration as it was a prerequisite to qualify for a rebate from state government bodies such as Solar Victoria. To register with the CEC, suppliers must hold an ERAC registration and have their products listed on the Electrical Equipment Safety System (EESS).

The ACMA also conducted market research to identify any major suppliers selling solar inverter devices into Australia that were not on the CEC or ERAC database. As no major entities in this category were identified, the selection remained targeted at suppliers who held a registration with the CEC.

Using the list of 66 solar inverter suppliers as a basis, the ACMA undertook further market analysis to identify the most popular inverter devices, methods of distribution and any specialised device functionality. Using these criteria, 19 suppliers were selected for audit.

Once the suppliers to be audited were identified, the ACMA requested a product list from these companies. We cross-checked the devices through market research and online databases to ascertain that the full suite of products the supplier had on the Australian market were being considered.

Based on the information available, it was determined that the selected devices for audit should fall into at least one of the following categories:

- > the device was incorporated with 'RF-enhanced' features such as wi-fi, Bluetooth and/or a 3G/4G modem
- > the device was considered a popular and trusted solar inverter available on the market, based on market research
- > the device had the highest levels of 'rated AC power' according to the CEC database, indicating complex electrical functionality.

These categories were determined as they span the array of labelling notices and associated equipment standards that may apply to solar inverter products (across both the residential and commercial space) while also reaching various market segments in the industry. The aim was to achieve an effective sampling methodology that would most accurately reflect the suppliers' overall awareness of all the regulatory arrangements that may apply to them.

Audit

In the audit notification letter, suppliers were given a high-level summary of the regulatory requirements that might apply to their products selected for audit (i.e. EMC LN, EME LN, RLN and/or TLN). The letter also included general guidance as to what types of compliance records should be produced.

In general, the documentation required to demonstrate compliance includes:

- > a method of uniquely identifying the device (brochure, photograph, user manual)
- > signed declarations of conformity (declaring conformity to the relevant standard)

- > complete copies of compliant test reports to the relevant standards in English or, in the case of a device coming within the scope of the [Radiocommunications Labelling \(Electromagnetic Compatibility\) Notice 2008](#), a test report or a technical construction file
- > photographs of the compliance labels on the relevant devices.

Ordinarily, each supplier was given 10 business days to submit their compliance records to the ACMA. Due to the disruption caused by COVID-19, however, some suppliers indicated difficulties in obtaining compliance documentations from their headquarters overseas. Extensions were granted upon request where there were reasonable grounds.

Compliance and enforcement actions

Compliance actions were taken in accordance with the ACMA's [compliance and enforcement policy](#) and determined on a case-by-case basis proportionate to the non-compliance identified.

The audit focused on the regulatory requirement for the supplier to produce compliance records, rather than the veracity of the testing of the devices. The test houses have separate requirements and safeguards to ensure that their testing is performed in accordance with the relevant standards. It was therefore determined that, in the first instance, a warning notice under section 187A of the *Radiocommunications Act*, pertaining to the failure to retain records, would be appropriate compliance action against the specific type of non-compliance identified in this audit.

Results

Key audit findings

The highlights of the audit are set out below.

| Overall |
|--|
| <ul style="list-style-type: none">> 19 solar inverter suppliers audited—ranging from two to four devices each.> 12 passed on initial review.> Six passed after being given an opportunity to correct their documentation.> One failed to apply the Regulatory Compliance Mark (RCM) on its products.> Compliance action taken against seven suppliers. |
| Electromagnetic compatibility |
| <ul style="list-style-type: none">> All suppliers demonstrated compliance with the EMC requirements. |
| EME and radiocommunications |
| <ul style="list-style-type: none">> All but one of the 19 suppliers demonstrated compliance with the EME and radiocommunications standard.> Six suppliers initially submitted incorrect documentation or failed to produce test reports in accordance with AS/NZS 2772.2:2011 as required by the RLN and EME LN.> One supplier failed to demonstrate compliance with the RCM labelling requirements under the applicable labelling notices. |

The initial review found that all 19 suppliers satisfactorily demonstrated compliance with the relevant standards relating to EMC testing.

In relation to EME, six of the 19 suppliers failed to provide documentation that would meet the applicable radiocommunications standard (RLN) and the applicable EME standard (EME LN). After being given an opportunity to correct their documentation, all suppliers satisfactorily demonstrated compliance with the RLN and the EME LN.

While the six suppliers were able to produce test reports and accurate declarations upon request, it was apparent that they were unaware of these regulatory requirements at the time of the audit.

One supplier was unable to provide evidence of the RCM label being affixed to its solar inverters. The supplier conceded that all its products currently offered in Australia did not have an RCM label affixed. Despite this, the supplier produced compliance documentation that would otherwise satisfy the required EMC, EME and RLN standards. The ACMA accepted a 60-day rectification plan as proposed by the supplier and will continue to monitor the progress of the agreed actions.

Compliance action consisting of a warning notice was taken against the above seven suppliers who did not meet the compliance requirements initially. This decision was made on the basis that these suppliers lacked understanding of their compliance obligations and ultimately conceded that they did not hold test reports for the standards mandated under the EME LN or, in one case, apply the proper RCM labelling.

The other 12 suppliers met the required standards upon initial review, with some minor administrative failures identified, but not of a nature to represent any substantive non-compliance.

Key stakeholder engagement: Clean Energy Council

The CEC has emerged as the peak body in the clean energy industry. It works with over 700 leading businesses in renewable energy and more than 6000 solar installers. Supplier registration on the CEC database is widely recognised and a prerequisite to qualify for a rebate from state government bodies such as Solar Victoria.

Stakeholder engagement has been a core activity of all previous priority compliance programs. Throughout the course of the compliance program, the ACMA worked closely with the CEC to ensure they were clear about the aim of the audit and received up-to-date information, including key audit findings.

At the commencement of the audit program, the CEC prepared and sent out a newsletter to its solar inverter supplier network,³ informing registered suppliers of the purpose of the compliance program. Towards the end of the audit program, the ACMA also sought support from the CEC for ongoing engagement initiatives to maximise the compliance outcome.

While the CEC runs several programs to maintain the quality of solar installers and retailers in Australia, the main requirements for its registration are related to electrical safety. During the audit, the CEC took actions to broaden awareness of the EMC, EME and Radiocommunications standards relevant to the solar installation industry.

To better inform its members and improve the overall level of industry awareness, the CEC has committed to continue working with the ACMA in various areas, including:

- > communications with its members about current and future compliance programs
- > more frequent newsletters and educative materials on the topic of regulatory standards mandated by the ACMA
- > potentially incorporating these standards into its criteria for registration.

As at June 2020, the CEC had published information about compliance with EMC LN, EME LN and RLN on its [website](#), including a flowchart developed in consultation with the ACMA to help solar inverter suppliers navigate through the regulatory regime. Solar inverter suppliers who wish to register their products on the CEC's approved products list are now prompted to consider the ACMA regulatory requirements before applying.

³ See initial CEC correspondence to its members: [ED20/29601](#).

Summary

The solar inverters compliance priority program undertaken in 2019–20 has successfully met the objective to assess solar industry compliance with relevant equipment standards and labelling requirements.

The audit findings largely matched expectations that solar inverter suppliers were generally cognisant of the electromagnetic compatibility (EMC) regulatory standards and can readily demonstrate compliance with the recordkeeping requirements upon request by the regulator.

The audit results also indicated that solar inverter suppliers were not fully aware of the relevant electromagnetic radiation (EME) compliance and radiocommunication standards or the impact of non-compliant solar inverters on the operation of radiocommunications transmitter such as wi-fi, Bluetooth and/or a 3G/4G modem.

As all suppliers have come into compliance after being given an opportunity to rectify. Education and awareness messaging will continue to be the most effective way to promote compliance. The ACMA will continue to work with the CEC to promote EME awareness.