

**RENEWABLE
ENERGY
TARGET**

Inspections update No. 20

Introduction

This inspections update provides a summary (as at 30 June 2021) of the Small-scale Renewable Energy Scheme (SRES) inspections program. The program is administered by the Clean Energy Regulator (agency) under Section 23AAA of the *Renewable Energy (Electricity) Act 2000* and Part 7 of the *Renewable Energy (Electricity) Regulations 2001*.

This update is a continuation of a series of [published inspections updates](#)¹, available from the agency's website.

SRES Inspections program

Each year, the agency inspects a sample of (solar) photovoltaic (PV) systems which have had small-scale technology certificates (STCs) created against them under the SRES "for conformance with Australian standards and any other standards or requirements relevant to the creation of certificates". This is required by law. The agency randomly selects PV installations for inspection. Participation in the program is voluntary.

This program complements, *but does not replace*, the electrical safety laws and inspection/compliance programs administered by relevant regulators in each state and territory. State and territory electrical safety regulators are responsible for electrical safety.

As part of our role, the agency provides reports to state and territory electrical safety regulators and the Clean Energy Council (CEC), and publishes inspections results on the agency's website.

We also share inspections results with peak industry bodies, electrical safety regulators, inspection service providers and industry more generally through education and outreach activities. The agency has no direct powers to deal with electrical safety matters.

¹ <http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Agents-and-installers/Small-scale-Renewable-Energy-Scheme-inspections>

Inspections results

A total of 33,729 inspections have been completed since mid-May 2011 (when the inspections program began) to 30 June 2021 (refer Table A Appendix 1). The inspections results below cover a total of 33,397 inspections for installations from 2010 to 2019.

This is because the agency aims for up to 12 months between system installation and inspection. This allows for an agent to claim STCs, which may be created up to 12 months after installation, and gives time for safety issues, such as water ingress in equipment, to manifest.

The agency will report inspection results for 2020 installations in future updates.

Unsafe and potentially unsafe PV systems

Unsafe is the most adverse rating in the SRES inspections program. The agency defines an unsafe PV system as one that has a safety hazard which poses an imminent risk to a person or property.

There is a small number of inspections where the PV system does pose an imminent safety risk, such as when there are exposed live parts and unsecure PV panels. However, the majority of PV systems previously rated unsafe do not pose an imminent safety risk. These systems have a varying degree of water ingress in direct current (DC) isolators (a disconnect switch), which may become unsafe without timely maintenance. Nevertheless, this risk is more than would be attributable to a substandard and the past practice has been to characterise such instances as unsafe.

Hence, this inspections update distinguishes between PV systems that were unsafe and potentially unsafe at the time of the inspection.

PV systems with any of the following checklist items marked unsafe have been categorised as unsafe:

- exposed live parts, and
- PV panels not securely mounted to the roof.

PV systems with the following items marked unsafe have been categorised as potentially unsafe:

- water ingress in the DC isolator enclosure near the inverter
- water ingress in the rooftop (array) DC isolator enclosure, and
- water ingress in cable junction boxes.

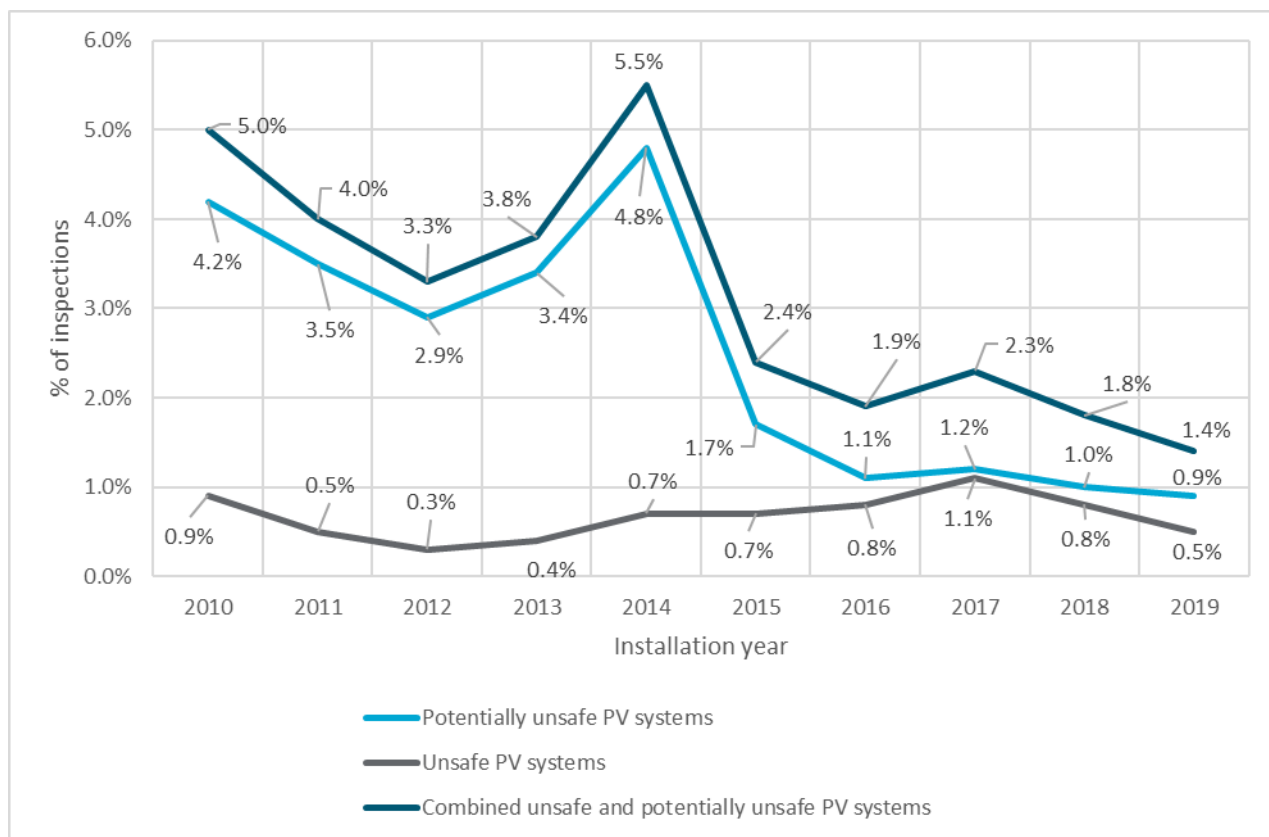
PV systems can also be rated unsafe due to other reasons that do not have a specific checklist item. For example, a system may have a number of non-compliant wiring checklist items that individually are not a safety risk but together make a system unsafe. These systems are also categorised as unsafe.

Results (unsafe and potentially unsafe)

Combined unsafe and potentially unsafe PV systems have declined from 5.5 per cent of systems installed in 2014 (0.7 per cent unsafe and 4.8 per cent potentially unsafe) to 1.4 per cent of inspections of 2019² installations (0.5 per cent unsafe and 0.9 per cent potentially unsafe) (**Figure 1**).

Over the life of the inspections program, water ingress in rooftop DC isolators and DC isolators near the inverter is the most common cause of potentially unsafe PV systems. A small proportion of DC isolators were also incorrectly wired or installed.

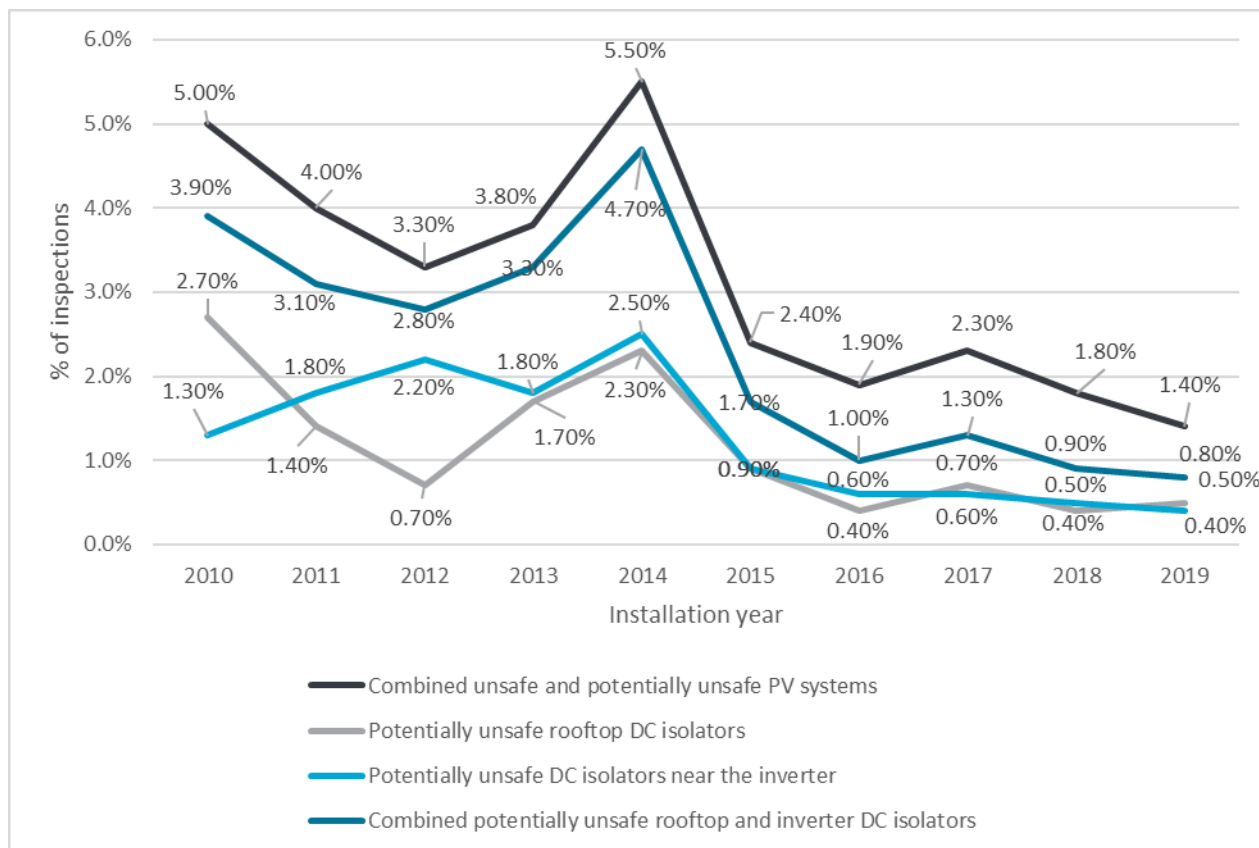
Figure 1 — Inspections where the PV system was unsafe or potentially unsafe



² At the time of this update, inspections of 2020 installations are underway. This update reports inspection results for installations installed from 2010 to 2019 under the SRES. The agency will report inspection results for 2020 installations in future updates.

Potentially unsafe PV systems due to issues with rooftop and inverter DC isolators declined from 2.3 and 2.5 per cent of inspections for the 2014 installations to 0.5 and 0.4 per cent for inspections of the 2019 installations (**Figure 2**).

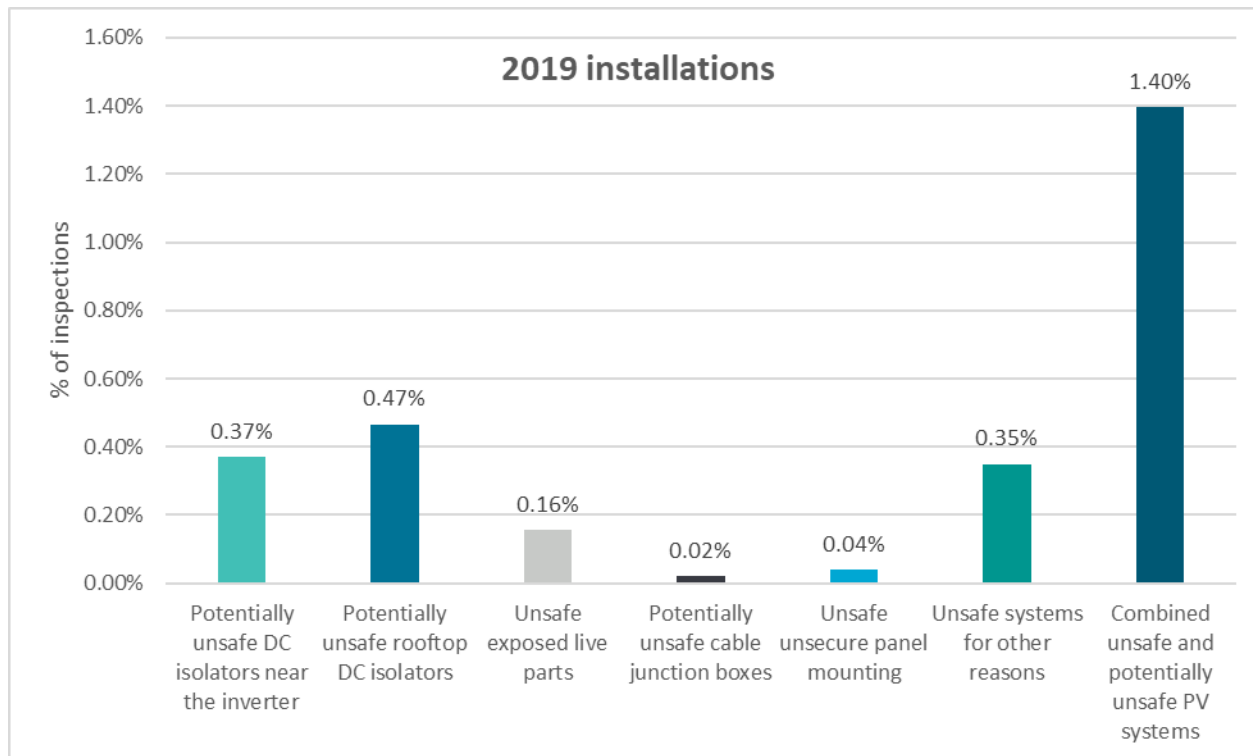
Figure 2 — Inspections where the PV system was potentially unsafe due to DC isolators



For 2019 installations, 72 out of 5,155 PV system inspected were rated unsafe or potentially unsafe (**Figure 3**). More than half of the systems rated as unsafe or potentially unsafe (0.84 per cent) had issues with DC isolators. Of these, 0.47 per cent were due to issues with rooftop DC isolators and 0.37 per cent due to DC isolators near the inverter. Other checklist items rated unsafe and potentially unsafe included exposed live parts (0.16 per cent), unsecure panel mounting (0.04 per cent) and cable junctions boxes (0.02 per cent).

As noted above, a PV system can receive an unsafe rating due to other reasons that do not have a specific checklist item. 0.35 per cent of systems inspected in 2019 received an unsafe rating due to other reasons. These include issues with rooftop and inverter DC isolators, cabling, AC isolators, inverter mounting, and earthing.

Figure 3 — Causes of unsafe and potentially unsafe ratings for PV systems installed in 2019



Actions taken for unsafe and potentially unsafe systems:

- The system was shut down or otherwise rendered safe by the inspector
- The owner and/or occupier of the premises were advised by the inspector of the nature and extent of the safety risk, and
- The relevant state or territory electrical regulatory authorities, the CEC and energy network provider were advised by the inspector of the nature and extent of the safety risk.

Substandard systems

A substandard system is defined as one that:

- does not meet key clauses in the standards and requirements for installation and may lead to premature equipment failure or other issues
- does not pose an imminent safety risk, or
- the installation work and/or the equipment should be improved to meet relevant standards and industry guidelines.

A substandard rating does not mean the whole system is substandard. Typically, such a rating is because one or more defects are found in the installation that do not affect performance. Defects may include equipment or installation non-compliance to relevant standards and industry guidelines.

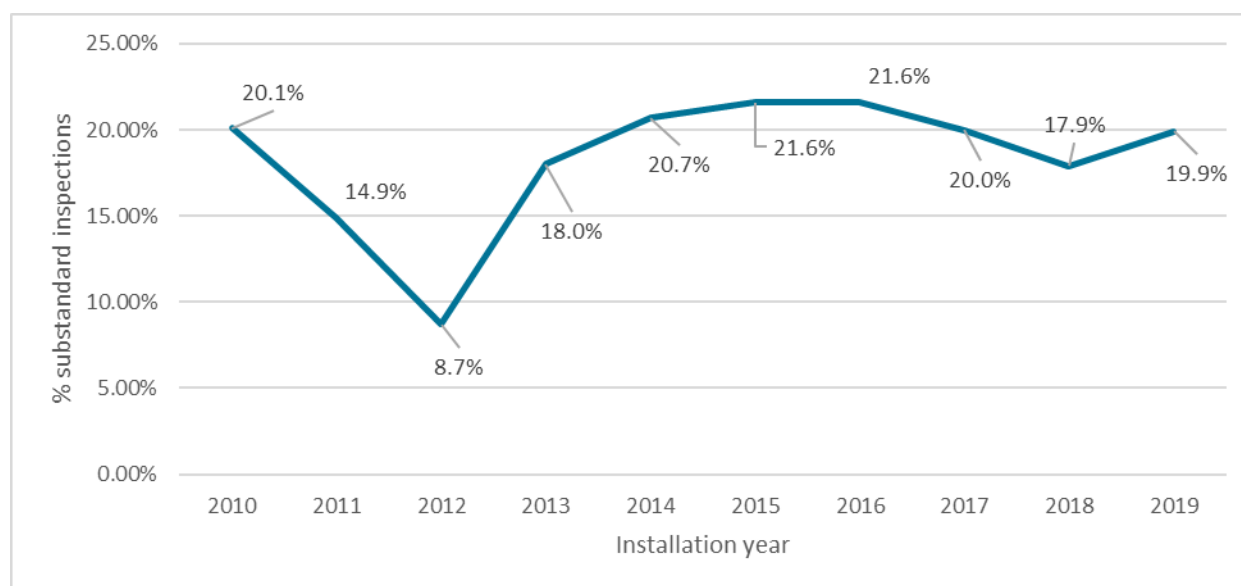
PV systems can also be rated substandard due to other reasons that do not have a specific checklist item.

Results (substandard)

New wiring and installation requirements in AS/NZS 5033 came into effect in October 2012 and resulted in more SRES inspections checklist items that could result in a substandard inspection³. One of these checklist items was the requirement that all DC cabling be in heavy-duty conduit. Substandard inspections increased to 18.0 per cent for 2013 installations and 12.4 per cent of these inspections did not comply with the new heavy-duty conduit requirement (**Figure 4**).

For 2014 installations, 20.7 per cent of inspections were substandard and 13.6 per cent of these inspections were substandard due to heavy duty conduit requirements. Compliance with the heavy-duty conduit requirement has since improved (2 per cent of inspections did not comply for 2018 installations). Over the life of the program, the majority of the substandard systems were due to issues with cabling, DC isolators (rooftop and inverter), PV array mounting and PV array earthing.

Figure 4 — Inspections where the PV system was substandard

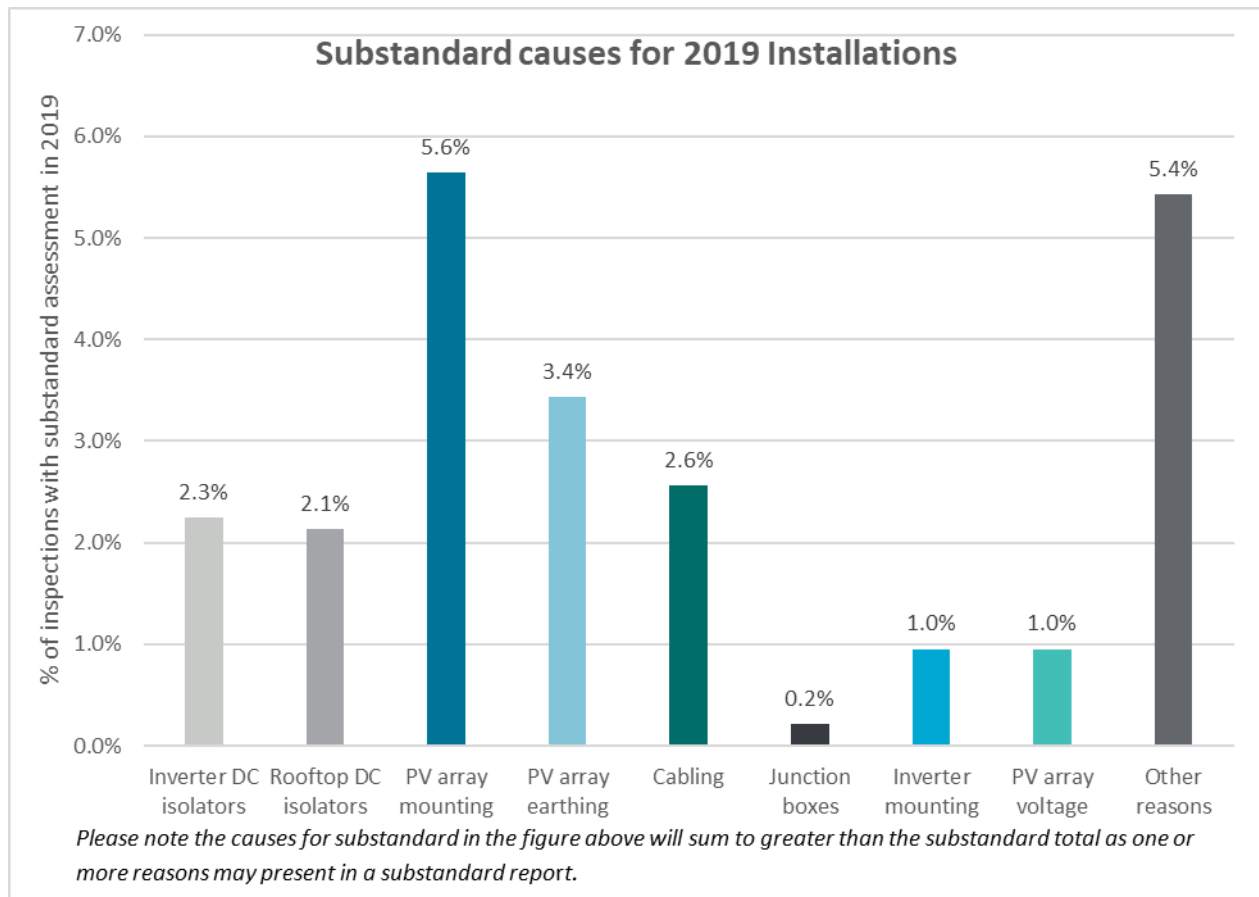


For 2019 installations, 1,024 out of 5,155 PV system inspected were rated as substandard. Substandard ratings were due to issues with PV array mounting, DC isolators (rooftop and inverter) and PV array earthing.

³ See page 29, [Analysis of Small-scale Renewable Energy Scheme Inspection Data to Assess Photovoltaic System Residual Systemic Electrical Safety Risks](https://www.cleanenergyregulator.gov.au/analysis-of-small-scale-renewable-energy-scheme-inspection-data-to-assess-photovoltaic-system-residual-systemic-electrical-safety-risks) ([cleanenergyregulator.gov.au](https://www.cleanenergyregulator.gov.au))

Other reasons for the substandard rating include DC isolators (rooftop and inverter), cabling, signage, PV array earthing, corrosion protection, PV array mounting and inverter mounting (Figure 5).

Figure 5 – Causes of substandard systems for the inspection of systems installed in 2019



Actions as a result of substandard classification and requiring rectification work:

- The owner and/or occupier of the premises were advised by the inspector of the nature and extent of the risk posed by the substandard issues, and
- The relevant state or territory electrical regulatory authorities and the Clean Energy Council were advised of the nature and extent of the risk posed by the substandard issues.

Appendix

Figure A: Yearly inspections numbers over the life of the program 2010 to 2019

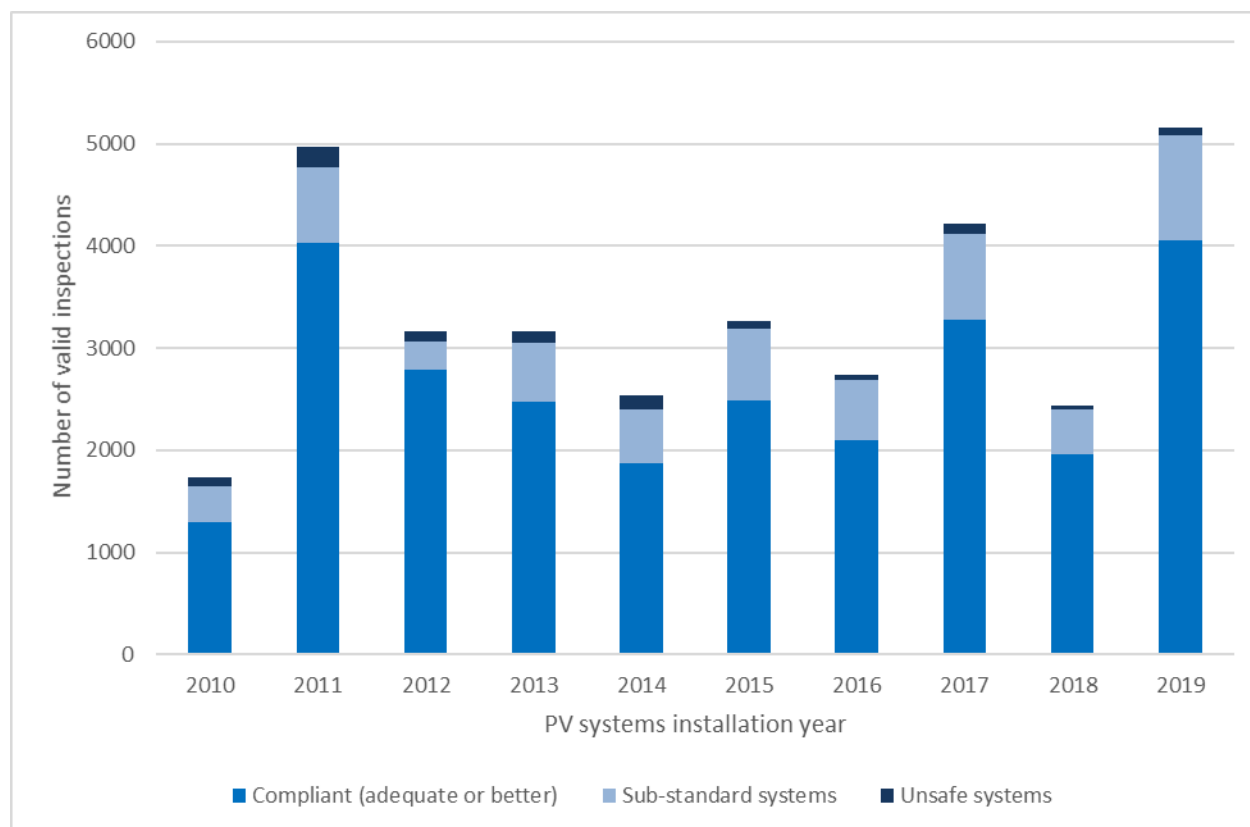


Table A: Completed inspections up to 30 June 2021 (over the life of the program)

Row Labels	Systems inspected	Unsafe systems	Substandard systems
ACT	375	13	45
NSW	7,799	233	1,393
NT	200	7	37
QLD	9,583	298	1,921
SA	3,823	61	699
TAS	426	20	69
VIC	6,671	217	976
WA	4,852	149	992
Total	33,729	998	6,132