

Inspections update No. 21

Introduction

This inspections update provides a summary (as of 30 June 2022) of the Small-scale Renewable Energy Scheme (SRES) inspections program. The program is administered by the Clean Energy Regulator (CER) under Section 23AAA of the *Renewable Energy (Electricity) Act 2000* and Part 7 of the *Renewable Energy (Electricity) Regulations 2001*.

This update provides results for the 2021-22 financial year inspections program, which covers installations that occurred in 2020.

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 CER inspects a statistically representative 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 CER randomly selects PV installations from across the country for inspection. Participation in the program is on a voluntary basis.

The CER works closely with industry and provides results obtained from the inspections program to state and territory regulators, along with the Clean Energy Council (CEC), who manages the accredited installers program. The results are also used to identify areas of concern which are then addressed through industry education, stakeholder engagement and outreach activities.

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. The CER has no direct powers to deal with electrical safety matters, however, results from areas of concern are communicated and addressed using a cross agency approach.

Individual inspection reports are also given to the system designer, installer, STC agent and the system owner/consent provider. This gives the designer and installer an opportunity to identify and correct issues (if identified) and provides the system owner with assurance of the status of their installation.

This report is also published on the CER website.

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



SRES Inspections program ratings

The SRES Inspections program uses a checklist that is developed with industry experts to consolidate items from regulations, standards, and industry requirements, such as the CEC guidelines. During 2022, the inspections checklist will undergo a review to ensure it is kept up to date with any industry changes, such as standards changes.

The inspections checklist uses three general categories to rate systems:

1. Compliant
2. Sub-standard
3. Unsafe and potentially unsafe.

Compliant PV systems:

Compliant PV systems are those rated industry best practice, compliant or adequate under the SRES inspections program framework. These systems generally meet the required standards however, may have minor non-conformances noted.

Substandard PV systems:

A substandard PV 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, however 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. Often these defects generally do not affect system performance, however they 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.

Unsafe and potentially unsafe PV systems

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

Most PV systems that are rated unsafe do not pose an imminent safety risk. These systems may have a varying degree of water ingress in direct current (DC) isolators (a disconnect switch), which may become unsafe without timely maintenance. These systems are categorised as potentially unsafe.

A small number of inspections may pose an imminent safety risk, such as when there are exposed live parts and unsecure PV panels, are categorised 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 as 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 as 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
- water ingress in cable junction boxes.

PV systems can also be rated unsafe at the inspectors’ discretion due to other reasons that do not have a specific checklist item. For example, a system may have several 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.

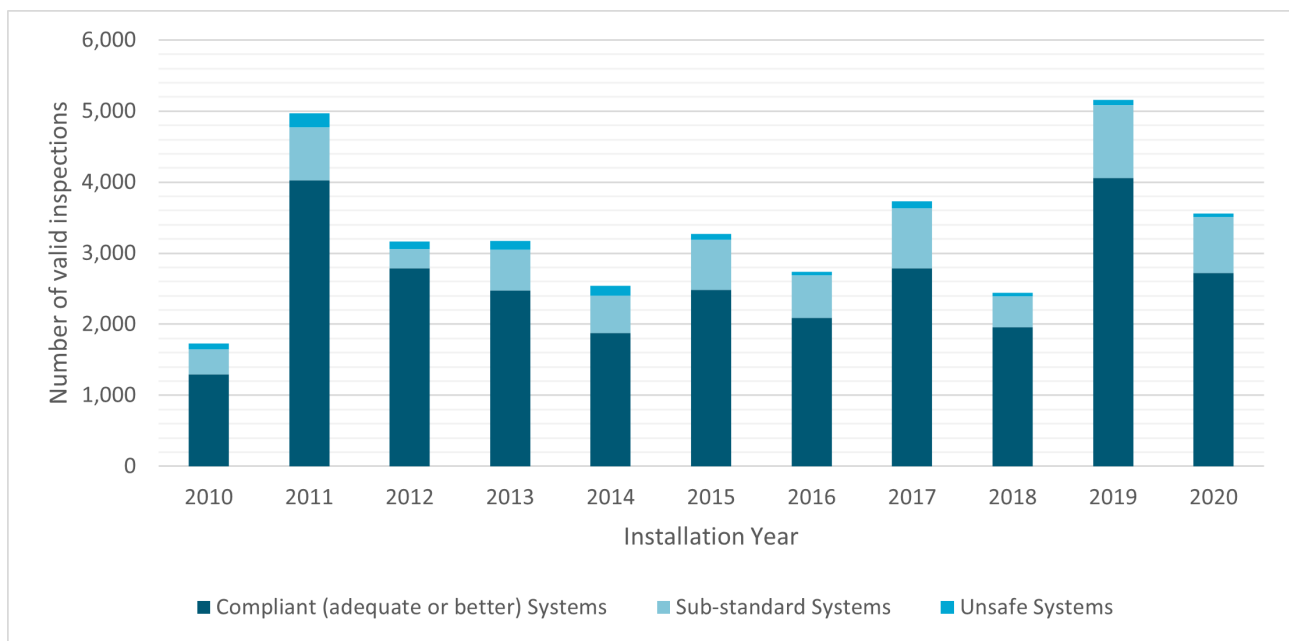
Inspections results

A total of 36,956 inspections have been completed since mid-May 2011 (when the inspections program began) to 30 June 2022 (**Figure 1**).

During the 2021/22 financial year, a total of 3,559 PV systems were inspected. All of these systems were installed during 2020. The CER aims for 12 months between system installation and inspection, which allows for an agent to claim STCs (may be created up to 12 months after installation) and gives time for safety issues, such as water ingress in equipment, to manifest.

The inspection results below cover a total of 36,956 inspections for installations from 2010 to 2020.

Figure 1: Yearly inspections numbers over the life of the program 2010 to 2020



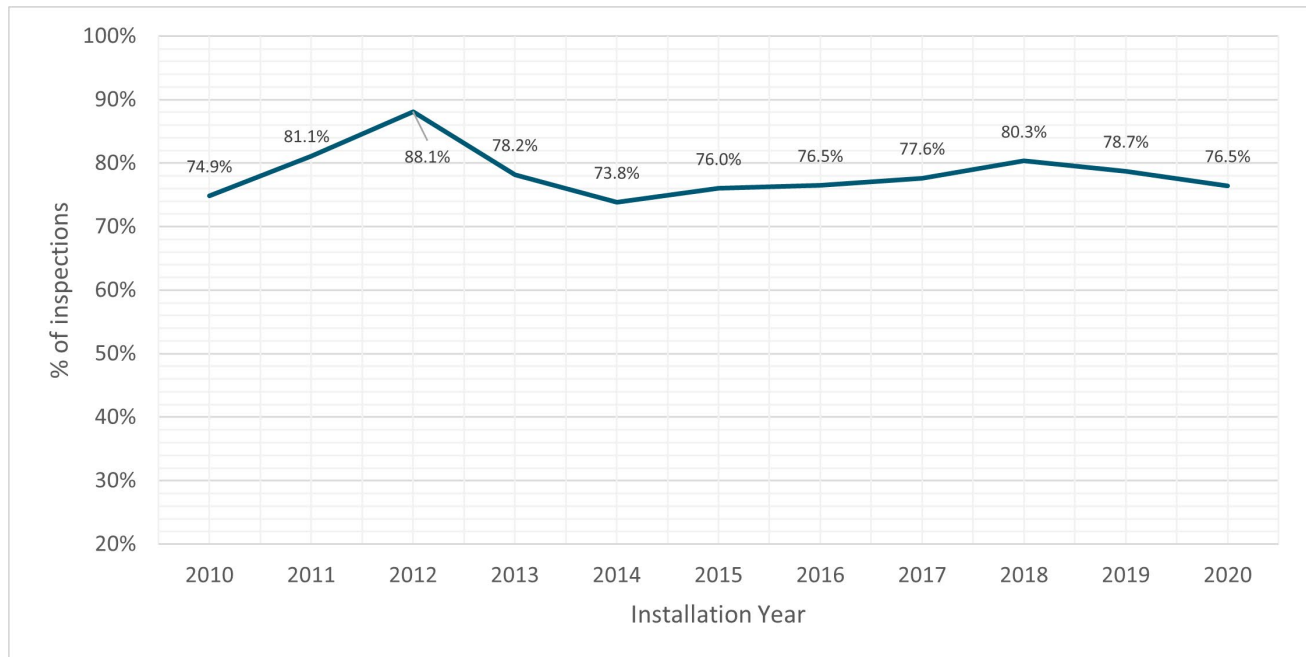


Systems rated compliant

For 2020 installations, 2,721 out of 3,559 (76.5%) PV systems inspected were found to be compliant (**Figure 2**). Over the life of the program, 78.6% of the PV systems inspected were compliant (adequate or better).

As can be seen in Figure 2, system compliance is trending down slightly, due to a number of issues including standards changes and improvements to the inspections framework. The CER is continuing to work with state and territory regulators to address and educate industry in these key non-compliance areas.

Figure 2: Inspections where the PV system was compliant



Systems rated substandard

For 2020 installations, 786 out of 3,559 (22.1%) PV system inspected were rated as substandard (**Figure 3**). Substandard ratings in 2020 were mostly due to issues with PV array earthing (7.4%), PV array mounting (6.0%), DC isolators (rooftop and inverter, total 3.8%) and cabling (2.0%). Other reasons for the substandard rating include cabling, DC isolators (rooftop and inverter), cabling, signage, PV array earthing, PV array mounting, and corrosion protection (**Figure 4**).

Over the life of the program, most of the substandard systems were due to issues with cabling, DC isolators (rooftop and inverter), PV array mounting and PV array earthing.

The increase in substandard percentage from 2019 (19.9%) to 2020 (22.1%) is mostly due to the increase in PV array earthing non-compliance from 3.4% in 2019² to 7.4% in 2020.

Actions taken for substandard systems:

- The CER is working with state and territory electrical regulators as well as the CEC to further analyse the earthing non-compliance and develop actions to address the issue.

² See page 7, [Inspections Update No 20](#)



- 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.
- The system designer/installer were provided a copy of the findings.

Figure 3: Inspections where the PV system was substandard

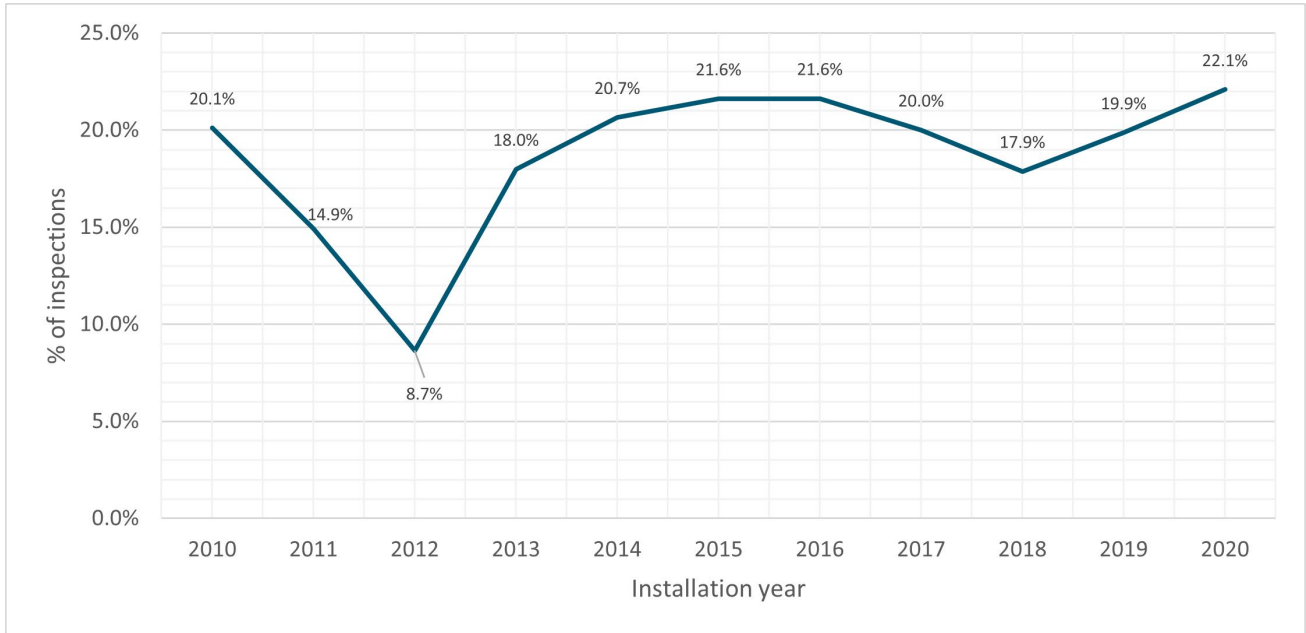
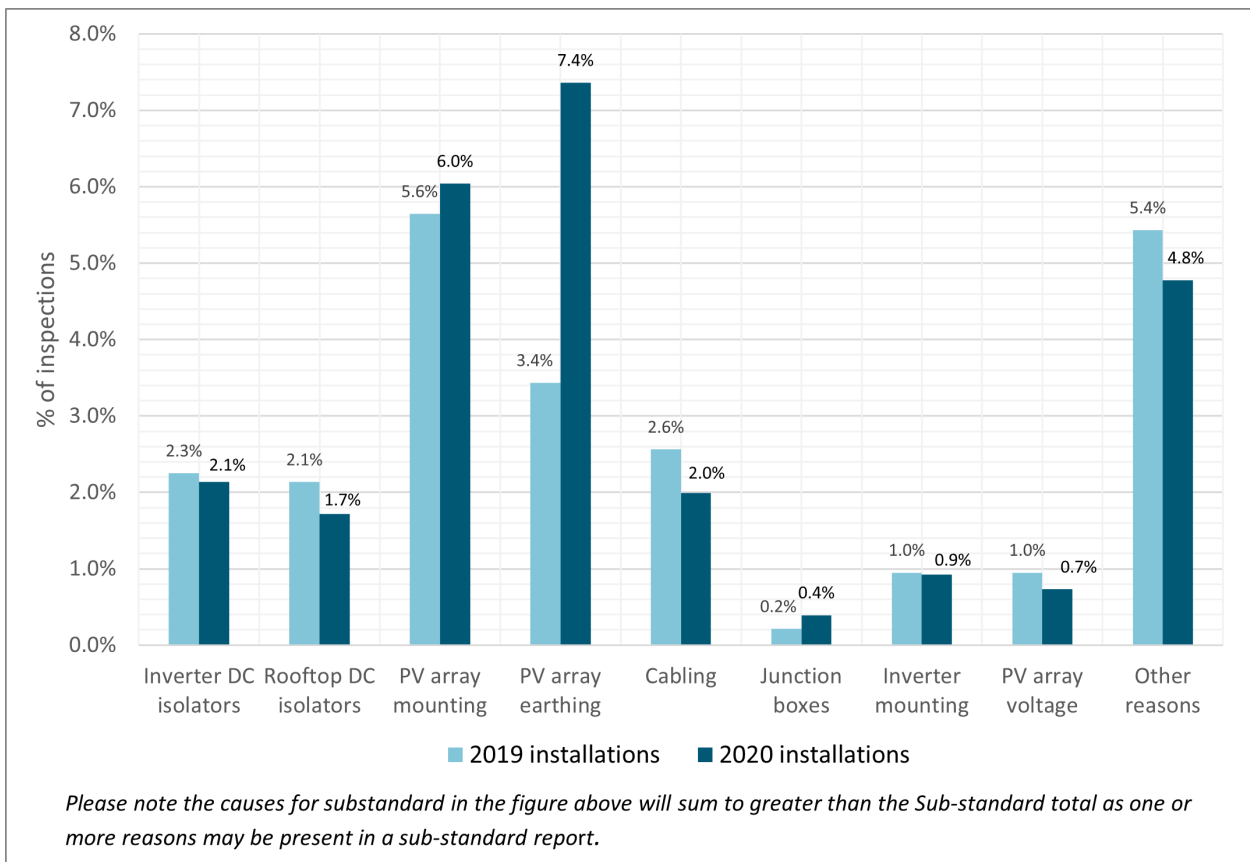


Figure 4: Causes of substandard systems for the inspection of systems installed in 2019 and 2020



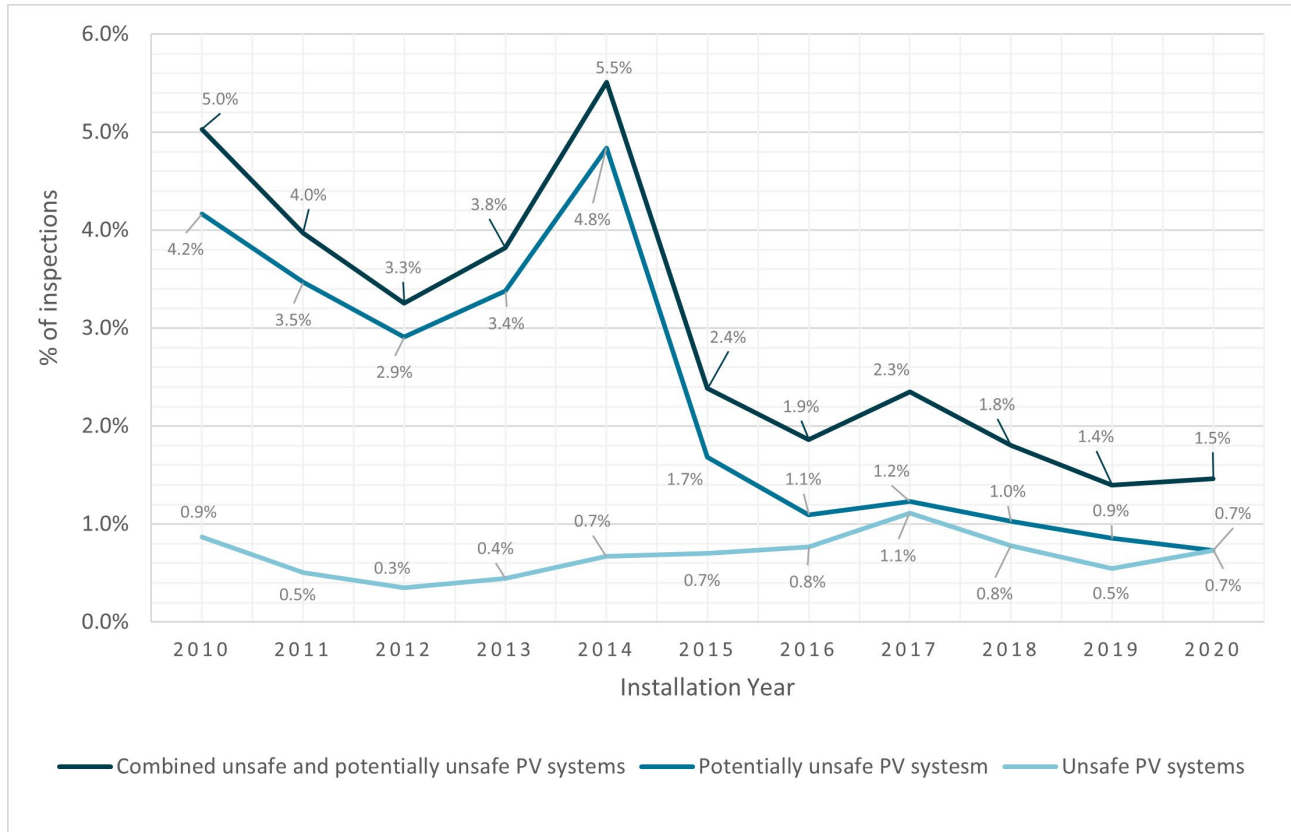


Systems rated unsafe and potentially unsafe

For 2020 installations inspected under the program, 52 out of 3,559 (1.5%) PV system inspected were rated unsafe (0.7%) or potentially unsafe (0.7%) (**Figure 5**).

There has been an overall downward trend in the level of unsafe and potentially unsafe systems installed each year since the inspection program started. Improvements have been noticed due to all facets of industry working together to improve safety standards of PV installations. Our program is driving these continued improvements through information sharing and collaboration with industry.

Figure 5: Inspections where the PV system was unsafe or potentially unsafe



Over the life of the inspections program, water ingress in both 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.

Potentially unsafe PV systems due to issues with rooftop and inverter DC isolators account for 0.3% and 0.5% of 2020 installations inspected (**Figure 6**).

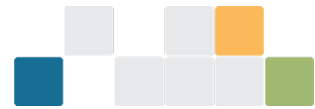
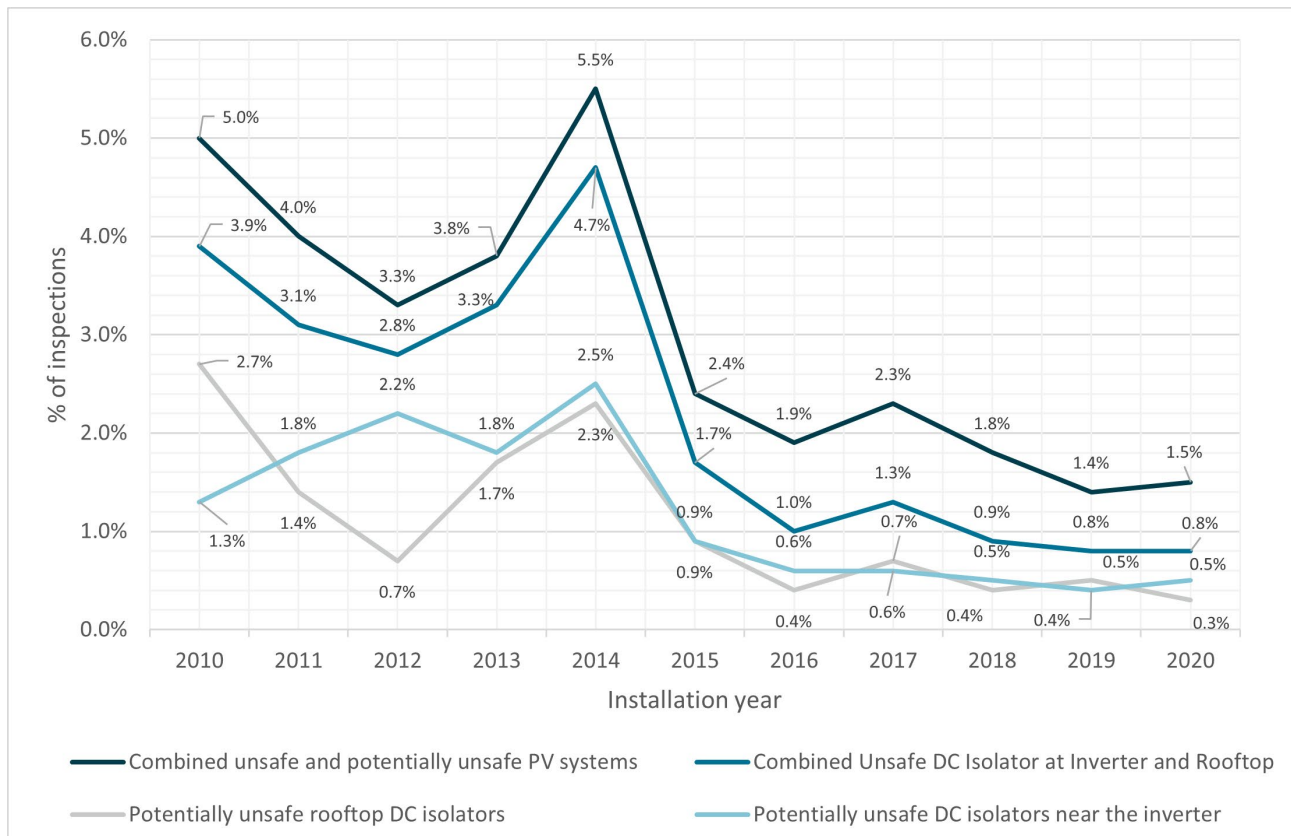


Figure 6: Inspections where the PV system was potentially unsafe due to DC isolators

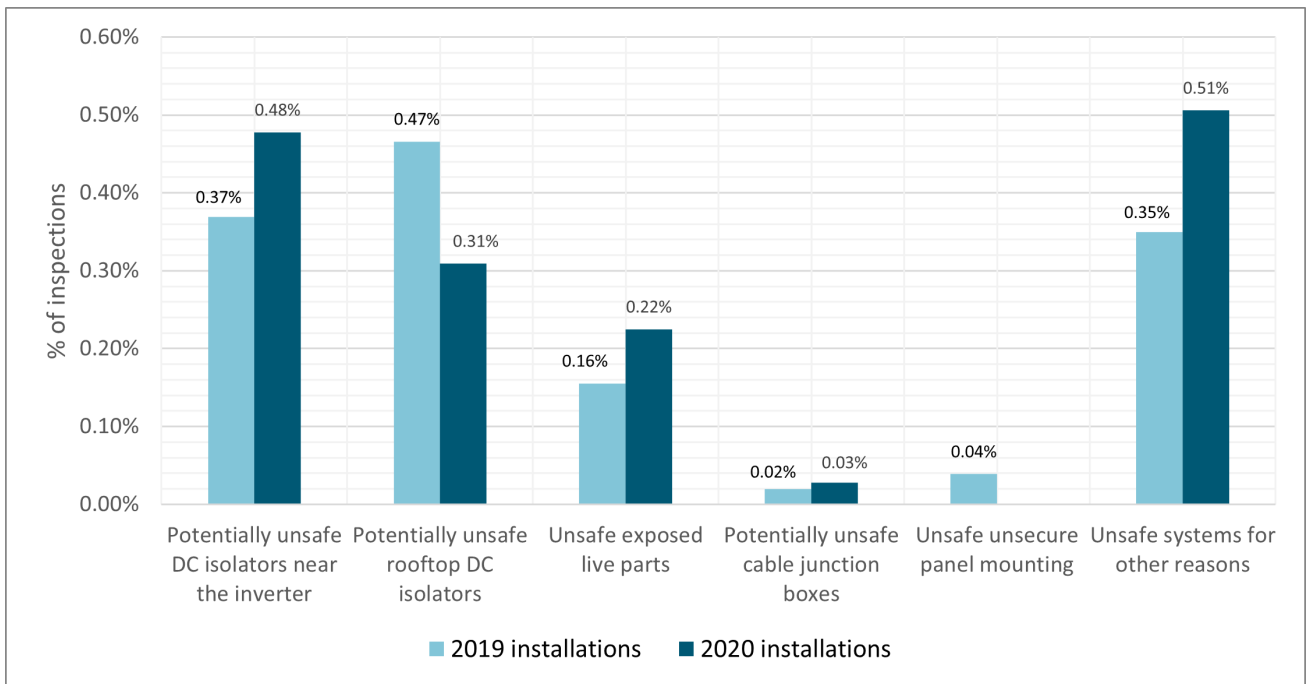


For 2020 installations, more than half (0.79%) of the systems rated as unsafe or potentially unsafe had issues with DC isolators (**Figure 7**). Of these, 0.31% were due to issues with rooftop DC isolators and 0.48% due to DC isolators near the inverter. These were changed from 0.47% for rooftop DC isolators and 0.37% for DC isolators near the inverter in 2019. Other checklist items rated unsafe and potentially unsafe included exposed live parts (0.22%) and cable junction boxes (0.03%).

As noted above, a PV system can receive an unsafe rating due to other reasons that do not have a specific checklist item. 0.51% of 2020 installations inspected received an unsafe rating due to other reasons. These include issues with cabling, DC isolators (rooftop and inverter), PV array mounting and PV array earthing.



Figure 7: Comparison of unsafe and potentially unsafe ratings for PV systems installed in 2019 and 2020



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.



Appendix

Table A: Number of inspections completed, unsafe and substandard systems for states and territories up to 30 June 2022 (over the life of the program)

	Systems inspected	Unsafe systems	Substandard systems
ACT	423	14	52
NSW	8,754	260	1,612
NT	222	7	39
QLD	10,398	311	2,177
SA	4,199	61	762
TAS	453	20	72
VIC	7,249	220	1,063
WA	5,258	151	1,070
Total	36,956	1,044	6,847