



# PV Module Quality, Reliability & Compliance

Presenter:

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# Outline



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## **Module quality**

- Parallel imports
- Positive power tolerance
- CEC Module Testing Program

## **Long term reliability**

- New testing regimes
- CEC Enhanced Listing

## **Quality Issues**

- PV module compliance issues
  - Fault reporting system
  - Common module problems found
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# Parallel Imports



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- Parallel importing is importing without the agreement of the manufacturer
  - Bypassing the established distribution channels
  - Parallel importing is not illegal in Australia
  - But claims about the quality, approval and warranty may be illegal
  - May not be compliant even if model number matches CEC list
  - May be second or third quality (even if claimed top quality)
  - They may have been sold for use exclusively in Chinese market
  - They may not be covered by manufacturer warranty
  - Any warranty is not supported by the Australian distributor
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# Parallel Imports



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How to tell if the modules are parallel imports

- Price is lower than market price
  - Ask the supplier
  - Check the manufacturer website for Aussie distributor & ask them
  - Check the documentation
  - Check the CEC list
  - Check the label for the certification mark
  - Ask CEC [accreditation@cleanenergycouncil.org.au](mailto:accreditation@cleanenergycouncil.org.au)
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# Power Ratings



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## Positive Power Ratings of Modules

- CEC has tested a number of 250W modules at 230-240W
  - Power rating tolerance is made up of two components
  - Sorting or Bin tolerance –
    - $250W \pm 5W$  or  $250W -0/+5W$  or
    - $250W \pm 3\%$  or  $250W -0/+3\%$
  - Measurement tolerance –
    - $\pm 2\%$                        $\pm 3\%$  or                       $\pm 5\%$  or                       $\pm 10\%$
  - Many manufacturers do not disclose or confuse these components
  - Check the warranty conditions
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# CEC Module Testing Program



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- New program to verify module compliance in Australia
  - Significant increase in module application fee
  - Targeted testing
    - Visual Inspection Report
    - Flash Test for Max Power rating
    - EL Testing
    - Other tests if necessary
  - University based labs - no NATA Accredited labs
  - Mainly for new modules
  - Field modules tested only if it may affect approvals
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# PV Module Quality



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- CEC list currently has over 16,000 fire-tested models
  - around 480 brands (manufacturers, co-licence holders, OEMs)
  - all have certificates for IEC61215 & 61730 with factory inspections
  - top 15 manufacturers produce around 60% of module shipments
  - What is Tier 1, 2 & 3?
    - Applies to manufacturers not modules
    - Relates to bankability for large project financing
    - Not publically available – different rating agencies
    - Not a guarantee of module quality or not going bust
  - CEC efforts to introduce quality differentiation into the approved list
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# Quality Systems

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- Externally Accredited quality system
  - ISO 9001:2008
  - Requires consistency, traceability & continual improvement
  
  - Factory surveillance systems
  - Eg TUV Rheinland “Power Controlled” program
    - Quarterly factory inspections
    - Random testing from production line
    - Verification of Flash Tester accuracy
    - Gives power rating confidence of +/-2%
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# Long Term Reliability

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- Existing standards do not cover long-term reliability
  - New standards under development
  - Certifying bodies have developed their own programs
    - “TUV Rheinland PV+”
    - “VDE Quality Tested”
    - TUV Sud Thresher Test”
    - “Atlas 25+ Certification”
    - “Fraunhofer PV Durability Initiative” (PVDI)
  - All provide enhanced testing
  - Targeting various field failure modes
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# CEC Enhanced Listing



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- Issue for Australia is market segments not valuing quality
  - CEC is introducing Quality & Reliability measures into the CEC list
  - Reporting modules which have had additional testing
  - Issues of verification and translation
  - May also report external ISO 9001 programs
  - Will extend program to other measures when available
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# Module Quality Issues

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## Number of reports of PV module fraud

- Involves re-labelling of modules at some point in the supply chain
- CEC often relies on vigilant installers to notify us of a problem

## How to tell if the modules are fraudulent

- Are you unsure or sceptical about the supply chain?
  - Is there any sign the labels have been changed?
  - Send a copy of the label to CEC if in doubt.
  - CEC will check against our records of labels submitted for approval
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# Compliance

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How to tell if the modules are fraudulent

- When installing a new module type, always check CEC website
  - **Model number must conform exactly** – every letter is important
  - Certificate holder name must conform – not just brand names
  
  - **Certifier Mark on label** – will be a new requirement
  - This is the logo of the certifying body showing module is certified
  - Not all labels yet carry this mark
  - Must conform to certifier on the CEC list
  - If a different Certifier Mark is on label, it is not CEC approved
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# Compliance



## Certifier Marks:

- TUV Rheinland new  
(Note ID number)



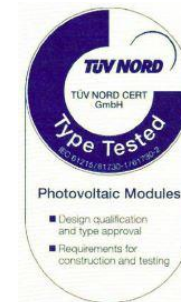
TUV Rheinland old



- TUV Sud



TUV Nord



- VDE



Intertek (ITS)



# PV Fault Reporting Portal



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Web Fault Reporting for logging of problems with modules and systems

- Project of CEC, APVI, Murdoch Uni, Uni NSW, CAT
- funded by ARENA
- Researchers need access to field data to validate testing
- CEC need info to strengthen and enhance module approval system
- Includes reporting of compliance issues
- Help raise the standard of PV systems in Australia
- Critical to understand the field performance of systems
- Not geared to fixing issues or problems
- Notify CEC if you have important information which needs action

[accreditation@cleanenergycouncil.org.au](mailto:accreditation@cleanenergycouncil.org.au)

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# PV Fault Reporting Portal



- Link is on CEC website



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Central to the Clean Energy Council's work with solar photovoltaic (PV) installers is an accreditation program we often refer to as the Solar Accreditation Scheme.

Clean Energy Council accreditation is a qualification that demonstrates an installer's competence in design and installation of stand-alone and grid-connected solar PV systems.

Systems designed and installed by Clean Energy Council-accredited installers are eligible for government incentives and rebates. There are now around 4500 accredited installers in Australia.

### FIND AN INSTALLER

We have accredited around 4500 installers of PV systems who are certified and trained to ensure your system meets industry best practice standards and all relevant Australian Standards. Search for installers close to you.

[MORE →](#)

### FURTHER READING

# Web Portal



## PV Module and System Fault Reporting Website

Exit this survey

### Introduction



**Project background:** This web-based survey is being used to collect information about faults, issues and problems associated with Solar Photovoltaic (PV) systems in Australia. It will assist in improving future PV system design, component selection and product development for Australian conditions. It is supported by the Australian Renewable Energy Agency (ARENA) and coordinated by the Australian PV Institute (APVI), the Clean Energy Council (CEC), and partners UNSW, Murdoch University and CAT Projects

**Survey participants:** This survey has been designed for anyone who owns, operates, installs or inspects a PV system and has detected a fault/problem with whole or part of the system. Module manufacturers are also encouraged to provide data collected from warranty returns. You can remain anonymous by not providing your contact details, however, we would prefer to be able to contact you if we need to clarify any of the information you have provided.

**Safety Instructions:** Users of the survey are advised that assessing some of the issues in PV installations should only be performed by a trained professional with appropriate safety equipment. We strongly recommend that only competent people with appropriate training and safety equipment climb on the roof to inspect the solar system. Only an accredited installer should touch the solar electrical wiring as dangerous voltages are present even when the system is turned off. Please engage a CEC Accredited Installer to inspect the system on your behalf and submit a written report to you with a photo of the module rating label if appropriate.

#### \*Declaration

I have read and understood the safety instructions.



# Web Portal

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## Initial Results - first 2 months

- 17 Responses since launch
  - 5 Module issues
    - backsheet delamination – 2
    - Glass breakage – 1
    - Junction box – 1
    - Cell corrosion, water ingress – 1
    - Output power degradation – 1
  - Not been fixed – at least 3
  - 9 Inverter issues
    - Complete failure – 4
    - Partial failure (unspecified) – 3
    - Overheating/Out of operating range – 2
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# Conclusions



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- CEC track all module compliance and quality problems reported
  - CEC are tightening and enhancing the module approval process
  - Industry needs to find better ways to promote quality products
  - Industry needs to support module test facilities in Australia
  - We need to be better at reporting problems
  - Report module compliance issues to CEC  
[accreditation@cleanenergycouncil.org.au](mailto:accreditation@cleanenergycouncil.org.au)
  - Report module and system problems on the web portal  
<https://www.surveymonkey.com/s/pvwebportal>
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# Thank you



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