

# Home Energy Grants: Technical Bulletin

Solar PV Installation Guidance  
Series 2022-08-001 SPV



## Introduction

Microgeneration is undergoing increasing popularity with homeowners. This is a big opportunity for your business. However, if we are going to scale up together, we need to bring about improvements in the efficient management of installs.

This document describes the issues and related clarifications that commonly arise on the programme.

SEAI requires that registered companies and their installers pay close attention to the contents of this document and use it for training purposes.

Installation must be carried out in accordance with the relevant:

- SEAI Domestic Technical Specifications and Standards (DTSS) and
- SPV Contractor's Code of Practice (COP).

In Appendix 2 of the Quality Assurance and Disciplinary Procedures (QADP) there is a full list of checks, used by SEAI inspectors. Use these checks as part of your own Quality Management System before signing and submitting DOWs to SEAI. <https://www.seai.ie/publications/Quality-Assurance-and-Development-Programme-for-Solar-PV.pdf>

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## 1. Quality Management Systems

It is important to have a good Quality Management System in place and to use it! All companies and installers must have a system in place regardless of the size of the operation.

Quality Management takes an end-to-end approach to compliance. Quality management sets standards for training and competency, the quality control of technical works and documentation, complaints management, and continuous process improvement. You can engage quality management consultants to help you manage your organisation in a more efficient way. This will improve your bottom line.

Some companies have an excellent compliance record with SEAI and we want to call this out.

There are two stages of engagement with SEAI that require compliance checks:

### Stage 1: Declaration of Works and Request for Payments

The majority of companies are returning Declarations of Works that are fully compliant with SEAI's requirements. Others are struggling and must improve.

### Stage 2: Inspections

Out of 132 currently active companies on the scheme, there are currently 43 that have inspections pass rate above 90%.

Credit must go to these companies - they show that works can be carried out to a very high standard, first time, every time. Their level of professionalism and commitment to quality is a great reflection on their company, their profession, the solar PV scheme and the Irish solar PV industry. Importantly, for the homeowner this leads to a great experience on their solar PV journey.

We intend to call out the names of the top performers in this bulletin from autumn onwards. Also, it is worth noting that high pass rates lead to lower inspection rates. This means quicker grant payments to you and/or your customers.

### Non-Compliances

For the companies that fell below the 90% pass rate, analysis shows that the highest rate of inspection non-compliances are for the following:

#### *Documentation*

- Errors in the use of the Shared HO docs template (see point 3 below)

#### *String inverter*

- Not set to Irish Grid settings
- Not within 1.5m of entry to building
- Not mounted on a fire-resistant surface

#### *DC Electrical*

- DC cables not to CoP (see point 2 below)
- DC cables not secure

#### *Array*

- Not minimum 500mm from roof edge

- No end caps on mounting bars

Conversely there are companies that are not performing well and have pass rates below 30% or carry out a very low number of installations each year. While we can work with any company that is willing to improve the quality of their work, companies that are not performing have a negative impact on the overall solar PV scheme and will be removed from the register.

## 2. Documentation

The non-compliance with the highest failure rate on the scheme was documentation.

- start-up/shut down procedure – must be given to homeowner in hard copy
- datasheets, warranties, O&M manual, system estimation – can be shared with homeowner and SEAI by means of the Shared Homeowner Documents Template

This is where there was a requirement on the company to share and with the homeowners. There is an appreciation that often these documents were in fact shared with the homeowner by the solar PV company, but the homeowner could not find them when the inspectors called as they may have been misplaced.

To counter this, in February 2022 we introduced the Shared Homeowner Documents Template. This allows the company to copy website links for the above documents to the template and upload to the portal where they are visible to both the homeowner and the inspectors.

The template for this is available on the SEAI website under the Supports section at the bottom of the PV page: <https://www.seai.ie/grants/home-energy-grants/solar-electricity-grant/>

It is important that this template is correctly completed with links for each applicable section. These links can be direct to the datasheet/warranty etc on the manufacturer's website or to a cloud-based storage. It is important that the inspector can click these links and access these documents. If they cannot access these, it will be a non-compliance, resulting in reworks.

Despite this introduction, some companies are still failing on this. The template is either not complete, not supplied or the links do not work. It is important to get this right. Getting documentation right has the highest chance of improving a company's overall pass rate.

See sample Shared Homeowner Template on the next page.

#### Template for uploading shared homeowner documents

Please fill in links to the below documents in the space provided. This document must be saved in pdf format once completed. Only homeowner Shared Documents in pdf format can be uploaded to the grant portal.

Systems Datasheet	
Panels datasheet	<a href="#">Product Sheet LONGi Solar LR4-60HPB-350M (solarnrg.nl)</a>
Inverter datasheet	<a href="#">Solis datasheet_RHI-(3-6)K-48ES-5G_AUS.pdf (ginlong.com)</a>
Mounting system datasheet	<a href="#">SolidRail-infos-en.pdf (k2-systems.com)</a>
Battery datasheet (where applicable)	<a href="#">Pylontech-data sheet</a>
Warranties	
Panels warranty	<a href="#">Longi Warranty</a>
Inverter warranty	<a href="#">Solis Inverter Warranty - 4G UK EON [REDACTED]</a>
Mounting system warranty	<a href="#">Warranty terms_EN.pdf (k2-systems.com)</a>
Battery warranty (where applicable)	<a href="#">Pylontech-warranty</a>
Other	
Estimation of system performance	<a href="#">[REDACTED] Photovoltaic Geographical Information System (PVGIS) - European Commission (europa.eu)</a>
O&M Manual for homeowner	<a href="https://[REDACTED]/downloads/homeowners%20manual.pdf">https://[REDACTED]/downloads/homeowners%20manual.pdf</a>
Basic start up, shut down, safety, operation and maintenance instructions	<a href="#">Solar PV System Procedure</a>

Fig 4; Shared Homeowner Documents Template

### 3. DC Electrical

DC cables not to Code of Practice (CoP) is the highest volume noncompliance in its category. Here AC & DC are not being separated and are either running in the same trunking or cable tied together. This is not to code and will lead to a failed inspection and subsequent reworks. This needs to be done right first time. AC & DC cables need to be run in separate trunking and where not in trunking, require simple separation.

See examples below



Fig 1: AC and DC cables not segregated





Fig 2: AC & DC cable tied together, not to COP. Simple separation is required



Fig 3: AC/DC run in separate trunking

#### 4. Maximum Inverter Size

The maximum connection at the network interface on a single-phase supply is 6KW. A second inverter on a system must be noted on the NC6 application. All AC generators must be included on the NC6.

Please see below extract from V1.4 COP

#### 4.8. Distribution System Operator (ESB Networks)

- All microgeneration (<6kW/25Amps AC for single phase connections) must complete a NC6 form from ESB Networks and submit by email or post to ESB Networks in advance of the installation.
- All micro generation must comply with ESB Networks Conditions Governing the Connection and Operation of Micro-generation.
- ESB Networks may reject the application within 20 working days of receipt
- The completed NC6 form and the record of issuing the form to ESB Networks must be retained for the PV system.
- Where an AC connected battery is included in the system, this battery is also considered a microgenerator for ESB Networks purposes and should be included in the NC6 application as an additional generator to the PV generator.

## 5. Shunt and battery back up

### **The shunt must isolate the solar panel array on loss of mains and cannot be re-energised from the battery backup.**

The shunt circuit must disconnect the solar array automatically when the AC power is removed and automatically reconnect when the AC is re-energized. The position of the shunt switch must be within 1.5M of the array. This also applies to external systems where the inverter is located outside and the shunt needs to be within 1.5m of the array, taking care to ensure the DC cable is appropriately protected from external forces i.e., use of conduit or SWA cable etc.

Where a "back-up system" i.e., battery storage with auxiliary supply is in use, the shunt switch operation must not be compromised and cannot be re-energised from the back up supply. In the event emergency services are called to a property and the mains electricity supply has been disconnected the shunt switch must maintain the disconnection of the solar DC supply and must not be re-energised by the auxiliary output as this will lead to a health and safety risk to emergency services.

#### 4.7. Emergency Isolation

Section 5.4.5 of Building Regulation TGD B - Fire Safety (2017) states that "where Photovoltaic (P.V.) panels are provided on buildings, provision should be made for the isolation of the panel array externally and in accordance with ET101, 2008" which has been replaced by I.S. 10101.

This requirement is regularly referred to incorrectly as a fireman's switch.

Section 465 – Emergency Switching off I.S. 10101 states that emergency switching is required;

- For all live conductors where a risk of electric shock is involved
- Must act as directly as possible on the appropriate supply conductors

A warning label must be applied to the main external AC connection point to the building stating "In Emergency Solar PV DC Circuit Automatically Disconnected with Disconnection of AC Supply to Building" or an equivalent statement.



## 6. Grid Settings

All inverters must comply with EN50549 with Irish Protection Settings as per ESB Document DTIS-230206-BRL (Conditions Governing the Connection and Operation of Microgeneration). This is available on the ESB website [https://www.esbnetworks.ie/docs/default-source/publications/conditions-governing-the-connection-and-operation-of-micro-generation-policy.pdf?sfvrsn=fccb2515\\_17](https://www.esbnetworks.ie/docs/default-source/publications/conditions-governing-the-connection-and-operation-of-micro-generation-policy.pdf?sfvrsn=fccb2515_17)

## 7. Labels

All Safety and Information labels must be in place. The required safety labels are as follows:

- In ESB meter cabinet. Add locations of emergency switches.
- In/on consumer unit and all distribution boards. Add locations of emergency switches.
- At breakers in consumer unit and sub-boards
- At/on inverter AC Isolator
- At/on PV System DC Isolator
- At/on battery AC or DC Isolator
- On string inverters
- On automatic Isolator
- On all off-grid AC supplied boards and equipment
- At check meter
- At breakers in consumer unit and sub-boards

The image displays a comprehensive set of safety and information labels for solar PV systems. The labels are organized into several groups:

- Label No 1:** A large warning label for 'DUAL SUPPLY' (Mains & Solar PV/Battery) with instructions on safety and emergency switch locations.
- Label No 2:** A smaller warning label for 'DUAL SUPPLY' (Mains & Solar PV/Battery) with similar safety instructions.
- Label No 3:** 'Grid AC Supply' label for use at breakers in consumer units and sub-boards.
- Label No 4:** 'Inverter AC Supply' label for use at breakers in consumer units and sub-boards.
- Label No 5:** 'Emergency switch AC supply to/from inverter' label for use at inverter AC isolators.
- Label No 6:** 'Emergency switch Solar PV DC supply' label for use at PV system DC isolators.
- Label No 7:** 'Emergency switch Supply to/from battery' label for use at battery AC or DC isolators.
- Label No 8:** 'WARNING CONTAINS HIGH VOLTAGE DC DURING DAYLIGHT Inverter' label for use on string inverters.
- Label No 9:** 'WARNING MAY CONTAIN HIGH VOLTAGE DC DURING DAYLIGHT Automatic Switch' label for use on automatic isolators.
- Label No 10:** 'Solar PV Check Meter' label for use at the check meter.
- Label No 11:** 'WARNING Off-Grid AC Supply' label for use on all off-grid AC supplied boards and equipment.
- Label No 12:** 'Battery AC Supply' label for use at breakers in consumer units and sub-boards.

Additionally, there are 12 pairs of 'WARNING High Voltage DC' labels, each featuring a lightning bolt symbol, intended for placement on various components of the system.

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A template of the above labels can be obtained on the Domestic Solar Photovoltaic Code of Practice for Installers V1.3 at: <https://www.seai.ie/publications/Code-of-Practice-Solar-PV-Grant.pdf>

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