SOLAR PV IN IRELAND FREQUENTLY ASKED QUESTIONS

TERMS:

1. kW = kilowatt. A kilowatt simply refers to 1,000 watts. It's used as a measure of electric **power**.

2. kWh = kilowatt hour. A kilowatt-hour measures the usage of 1,000 watts of energy in the space of one hour. It's a measure of **power consumption**. For example, a 100-watt appliance switched on for 10 hours uses 1,000 watt hours or 1 kWh of electricity.

3. kWp = kilowatt peak. This is the unit of measurement for the output of a solar photovoltaic (PV) system. In other words, it describes the maximum output in kilowatts that your solar PV system can produce in ideal conditions.

1. What is Solar PV?

Solar panels that transform light into electricity are known as solar photovoltaic (PV) panels. "Mono-crystalline silicon panels" are considered the most efficient type of solar PV panels at converting light into electricity and the most widely deployed type of rooftop solar worldwide.

At the point where sunlight strikes a solar PV panel, DC (Direct Current) electrical power is generated. This DC power then travels to an inverter where it is converted to usable AC (Alternating Current) power for use with any electrical devices such as TVs, phone chargers, microwaves, refrigerators, etc.

A solar PV system is typically made up of:

- **Solar panels** on the roof which generate DC (direct current).
- An **inverter** which converts this DC into AC (alternating current – to power your kettle, toaster, TV, etc).
- Optional - a **diverter switch** to use any surplus energy to heat your water.
- Optional - A **battery storage system** to save surplus energy generated during daylight hours for later use (night-time for example).

2. Do solar panels work in Ireland?

Yes they do. It is visible light that drives solar PV cells, not the heat from the sun. Therefore Ireland's climate is much more favourable to solar PV than many people realise, allowing it to still function on cloudy or rainy days, (although not quite at the peak performance achieved on cloudless days).

3. How much electricity will solar panels generate?

The amount of electricity generated annually will depend on a range of factors including the hardware chosen, size of system, roof slope and the direction in which the panels are installed. Typically a 3kW (3 kilowatt) solar PV system would generate around 2,600 - 3000 kWh (kilowatt-hours) of electricity a year if well-located, about 50% of the annual electricity demand of an average Irish home.

For some added perspective, an electric oven uses about 2.3 kWh (1 hour of cooking) while a 50" LED TV uses around 0.016 kWh (1 hour of use).[1] There are about 8766 hours per year.

4. Are solar panels right for my home?

There are two main considerations when determining whether or not solar panels are right for you - (a) whether you have a suitable roof on which to install your panels and (b) what your pattern of energy usage is.

Roof Suitability:
To determine if your roof is suitable for solar PV, you need to consider its age and condition, its slope and orientation, and if there is any potential shading from nearby trees or buildings. The best rooftops for maximising electricity generation are those with sufficient space to accommodate the required number of panels, have a 35 degree slope, a south-facing aspect, in good condition and have minimal shading. (However, the best aspect to maximise solar generation for your particular situation may be East or West depending on your pattern of energy usage - see below).

Pattern of Energy Usage:
As solar PV systems generate electricity only during daylight hours and predominantly around the middle of the day when you may be at work, you need to consider how much of the generated electricity you will use in your home. Without any additional systems, a lot of the generated electricity can be spilled (exported back) to the grid. While many electric utility providers will pay you a wholesale price for this excess solar electricity you provide them, you will save more by using it to meet your electricity needs rather than selling it to them.

5. How many panels will I need & how long does the install take?

It takes approximately 1 day to install a solar PV system. While the final size of the system depends on the household's electricity demand and the availability of suitable roof space, below is a rough estimation of system size using 410W panels:

System Size	Solar Panel Array
2 kWp (for small 2-bed home)	~9m^2 area (~5 panels)
3.0 kWp (for larger 2-bed home)	~14m^2 area (~8 panels)
3.5 kWp (for standard 3-bed home)	~16m^2 area (~9 panels)
4 kWp (for larger 3-bed home)	~18m^2 area (~10 panels)
5 kWp (for 4-bed detached home)	~22m^2 area (~12 panels)
6.5 kWp (for 6-bed detached home)	~29m^2 area (~16 panels)

6. How much do solar PV systems cost?

The overall trend has been a considerable reduction in the cost of purchasing and installing solar panels over the last 10 years. However, recent high inflation, hikes in energy prices and the introduction of "feed-in tariffs" have increased the cost of these systems recently.

Broadly speaking home PV systems should range from around €1,500 - €2,000 per kW installed (ex VAT), but prices will vary depending on the hardware chosen, size of system, accessibility of the roof or site, and installer used.

Despite the upfront cost, it is worth remembering that there is a guaranteed return on investment with an average payback within 7-10 years (with the SEAI grant). After this time, you will be generating free electricity for the remainder of your system's lifespan (25+ years).

7. Do I need planning permission to install solar PV on my roof?

Generally, you will not need planning permission if the solar panels take up less than 12m^2 (or less than 50% of the area of the roof), which is about the size of a 6-panel system. However, ask your local authority for guidance about planning permission if your home is a protected structure or is located in a protected area, (e.g. an architectural conservation area).

However, under recent draft regulations from the Department of Housing, Local Government and Heritage, it is proposed to increase the existing planning exemptions for installing solar panels on rooftops of homes, regardless of their geographical location. Solar installations will be able to cover the entire roof of a house, subject to minor setback distances from the edge of the roof.

8. How can I use the maximum amount of solar power I generate?

The solar PV system should be designed to supply a sizeable amount of electricity a household needs at the time of day it is needed so as to reduce spill of excess solar-generated electricity back onto the grid.

For example, a house with regular daytime occupancy should use all energy-thirsty appliances (like the tumble dryer or dishwasher) or charge their electric vehicle during the peak solar generating hours of 10am-4pm. For those who use the majority of electricity in the mornings, an east-facing panel array would make the most of the morning sun. Likewise, if you only use electricity in the evenings, a west-facing array may save you more money.

Another simple measure is to install a 'diverter switch' which monitors the solar power generated and the electricity demand in the home. If there is any excess generated, it is diverted to heat your hot water in your immersion tank which you can use later.

9. What about a battery storage system?

Adding a battery also helps maximise the amount of electricity generated that you use. For example, if not home during the day, the battery can store unused solar electricity and allow you to use it at a time that best suits you. However it will add to the installation and maintenance cost of your PV system. If not ready for battery storage yet, you can ask the installer to set up the infrastructure now to easily incorporate battery storage in the future.

10. What about grants?

The SEAI solar panel grant is now available for all houses (built before 2021) and businesses. It is based on the size of the system you install - i.e. more panels means a higher grant, but only to a maximum of €2,400.

System Size	Grant Value
2 kWp solar PV system	€1,800
3.0 kWp solar PV system	€2,100
3.5 kWp solar PV system	€2,250
4 kWp solar PV system	€2,400
5 kWp solar PV system	€2,400

Remember that if you install more than 4kW of solar, you will still only get a €2,400 grant. Other things you get installed (such as batteries and immersion diverters) do not affect the amount of the grant. The grant takes the form of a once-off payment to a homeowner once all work has been completed.

11. Is there a 'feed-in tariff' payment for excess solar electricity I export to the grid?

Yes, there is now an obligation for energy suppliers to pay their domestic customers for the excess electricity they generate with their solar panels that is exported back out the national grid. Officially this is called the Clean Export Guarantee (CEG) tariff. To find out what rate you will receive, contact your current electricity supplier.

In a slightly different system to homeowners, businesses will be paid for surplus energy sold back to the grid through a Clean Export Premium (CEP) feed-in tariff.

12. Will my rooftop PV system require maintenance?

PV systems are very low-maintenance, but require occasional monitoring. The inverter should be checked routinely to make sure the system is operating with no errors. Also, it is good to get an idea of how much electricity your PV system could generate yearly from the installer and compare this with how much your system generates. If there is a huge gap between expected vs. actual, this is likely a failure in the inverter which might need replacement at some point in the 25 year+ lifetime of your PV system. The solar panels themselves are extremely robust, but consideration should be given to cleaning them every few years to maintain their performance.