Why choose Solar Panels?

Solar energy is an increasingly popular choice among Irish homeowners and businesses.

The energy source itself is free and can be utilised anywhere the sun shines and with the progression in solar technology over the past decade, that even includes the year-round Irish climate!

With more varied market choice and improved solar systems and storage than ever making us a viable nation of solar energy consumers, there are, however, some obstacles to overcome if we're to truly embrace solar on a national scale.

Harnessing just a tiny fraction of the sun's energy to convert it to home-consumable heat and electricity is a complicated process; you need the right equipment, systems and design infrastructure to leverage solar energy effectively and of course, that initial installation outlay comes at a short-term cost.

However a well designed system fitted on your rooftop or in your garden will not only save you energy but will improve your homes value, carbon footprint and deliver an improved BER rating.

What is Solar Power?

Solar power is the energy converted from sunlight into usable electricity.

Sunlight is harnessed directly with solar panels. Solar panels are made up of a transparent photovoltaic (PV) glass as well as PV cells which are responsible for converting sunlight into electricity.

The sun's power can also be harnessed as thermal energy via the use of concentrators and reflectors. Energy harnessed through solar panels can then be used to provide electricity for residential homes as well as businesses anywhere in Ireland.

Thermal energy has various everyday uses such as heating homes during cold weather or the solar heating of water in place of traditional gas boiler and immersion systems.

How does Solar Panels Generate Electricity?

Once fitted, the solar panels on the roof of your home are connected to other devices for complete energy generation throughout your home.

When sunlight hits the solar panels, electronic flow is activated in individual solar panels, the resulting electric current is referred to as direct current (DC). The electricity used to power our essential electronic properties such as lighting of houses and powering our computing and entertainment systems.

Thus, the DC electricity generated by the solar panels needs to be converted into alternating current to make it applicable. The conversion of DC to AC power is carried out by a device known as an inverter.

The two main types of inverters are string inverter or hybrid inverter there also micro inverters that fit on each individual solar panel, but they are less popular in Ireland.

Single string inverters convert DC to AC and feed the house requirement including an immersion diverter if fitted any surplus energy is sent back to the grid.

Hybrid inverters employ AI to sequentially deal with the electricity demand for the home. The electricity produced will fully satisfy the demand for the house excess powers will be fed to the battery storage and may be further diverted to water heating or car charging.

This will ensure optimum use of all solar electricity generated with any remaining energy flowing back to the grid.

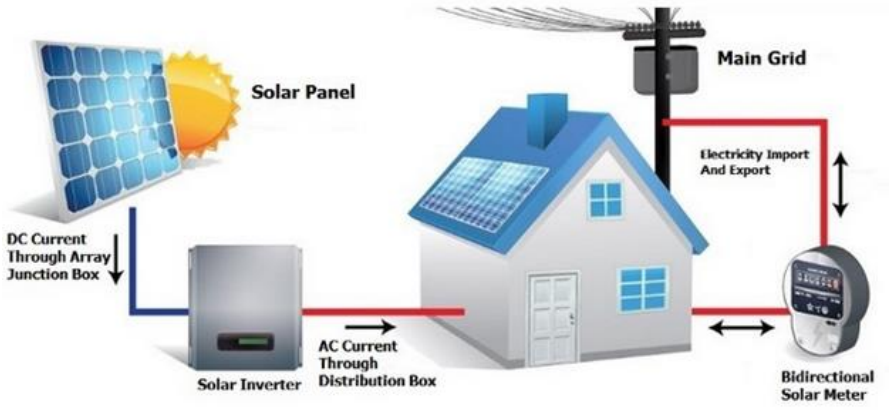
Once electricity has been generated by the solar panels, it flows via the inverters and is converted into AC power. After conversion, electricity flows to either electric loads or power meters which measure the amount of power generated, depending on the type of inverter fitted.

The energy generated can either be used to power appliances directly, stored in batteries, or sent back to the power grid for distribution into other places. The solar energy systems such as the **integrated K-Star system** more commonly found in Ireland may use batteries for energy storage.

Almost all systems installed in Ireland are grid connected as a solar system will rarely deliver the full electricity requirement for a home for a full year.

Less commonly used, a grid-connected system utilises the grid system as the energy storage as well as the power distribution system, Irish consumers can now benefit from a Feed in Tariff from their Energy supplier although the rates paid per Kw are less than they currently charge so it is always advisable to design and install a system for maximum self-use.

Components of a solar power system

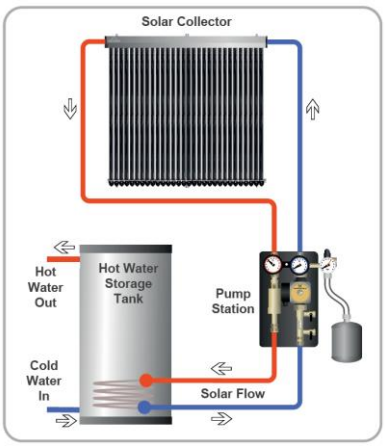


How does a Solar Hot Water Heating System Work?

Thermal Solar utilises evacuated tubes technology to exclusively heat water and can generate up to 70% of your hot water needs from free solar energy. It works as follows:

1. Solar energy is absorbed by the dark coloured absorber and transferred to copper pipes that contain a fluid.
2. The pump station circulates the solar heated fluid back to the hot water tank.

3. Throughout the day the solar system gradually raises the temperature in the hot water tank.
4. A backup energy source (electric, gas etc) ensures hot water supply when solar output is not able to fully meet demand.



The dedicated solar hot water heating system can be a single tank (as illustrated above) or a dedicated solar tank can provide pre-heated water to a main hot water tank.

What are the Different Types of Solar Panel Technology?

Solar Photovoltaics (Solar PV)

Given the constraints of CSP, Solar PV panels are more popular in terms of demand, affordability and reliability for Irish homeowners and businesses and as such, solar PV is best suited for use here in Ireland.

There are three main types of solar PV panels most commonly found on the Irish market: thin film PV panels, mono-crystalline, and polycrystalline PV panels.

Thin film panels

Thin film solar panels are produced via the spraying of a thin layer of semiconductor material over another surface made of either glass, plastic, or metal. They are incredibly thin (around 20 times thinner than traditional c-Si semiconductor wafers) making them flexible and lightweight.

A thin film panel may last for over ten years, which is usually less than the average crystalline panel. However, with consistent technological advances improving the durability of thin films, they could soon reach a twenty-year lifespan.

Mono-crystalline panels

More effective and efficient when compared to their counterpart thin films and polycrystalline panels. Monocrystalline modules are made of a single silicon crystal. Being the most efficient and highest-quality panels, they're also the most expensive.

Most of the crystalline panels available in the Irish market are made of mono-crystalline and are usually made from many small crystals.

Many MC panels fitted also use a new technology called PERC Technology (Passive Emitter and Rear Cell) designed to capture reflected light at the rear of the panel to improve efficiency.

Modern design, using matching black cells, back sheet and frames with a long lifespan make this monocrystalline panel option an increasingly popular choice throughout Ireland's regional residential hubs.

Poly-crystalline solar panels

The cells on polycrystalline PV panels are formulated by melting together several fragments of silicon rather than a single silicon crystal as in the case of mono crystalline. The difference in efficiency creates a need to use larger poly-crystalline panels that can generate the amount of energy required. Poly-crystalline are less efficient when compared to mono-crystalline and are, therefore, cheaper.

Matt black panels are also very popular in Ireland with both customers and city planners due to their visually more attractive profile...

How Long do Solar Panels last for?

Solar panels usually last somewhere between 20-30 years. This does not mean that solar panels stop generating electricity after this timeframe, but rather it means that their efficiency will gradually reduce.

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Do Solar Panels Work on Cloudy and Rainy Days?

Perhaps the most common question we get asked in relation to solar energy in Ireland! Thankfully, modern solar panels still work properly during cloudy, wet and rainy days.

However, solar panels are naturally most efficient during sunny weather because of the direct sunlight being harnessed from the sun. In inclement weather conditions, solar panels will still generate power as the solar cells are usually powered by light and not solar heat.

For solar panels to be certified for installation on an Irish home, they are subjected to rigorous reliability tests.

What are the Advantages of Using Solar Power?

There are numerous advantages of using solar power. Here, we cover some of the main ones:

Solar energy is a truly renewable energy source which does not deplete on usage.

Solar energy will substantially reduce your electricity bills

Meeting your energy needs by your own installed solar energy system will substantially reduce your energy bills. The amount saved by the system depends on its size or the size of heat usage in your home; the current recommendation from the SEAI is that a solar system should be sized to cover a maximum of 70% of annual electricity usage.

Irish Solar installers will produce a report for your home using bespoke software that uses your location or Eircode to determine the potential output of your system. Determining

factors include, location, system size, roof orientation South-facing is best but East-West orientation also works very well.

Systems from 3 to 6 kWh are most popular. Six kilowatt systems are the maximum domestic systems currently allowed in Ireland however commercial systems can be much larger but must conform to the rules set by ESB Networks

From your solar installation, there is also a likelihood of receiving payments for the surplus energy generated.

This is possible when your system is connected to the ESB Network power. If you generate more electricity than you require, the extra energy is sent to the grid and you're compensated. In case your system generates less energy than is required, the grid can also use the extra energy sent there to meet the deficit.

Feed in Tariffs (FIT) are now available from all Energy suppliers.

Solar energy has diverse applications throughout your home.

Solar energy has low maintenance costs.

Solar energy systems have no moving parts like wind turbines, which means that wear and tear are eliminated. The inverter and the batteries are the only components that may require to be changed in about 10 years.

Thus, the lower maintenance cost of solar panels means lower system costs, and more savings for you in the long run.

What are the Disadvantages of Solar Energy Installation?

Like anything with a list of pros, there are also some cons to consider when weighing up solar as a viable solution to your future home energy requirements.

The initial cost of installing solar panels can prove substantial however, with the current electricity cost at an all-time high the payback period has dramatically reduced.

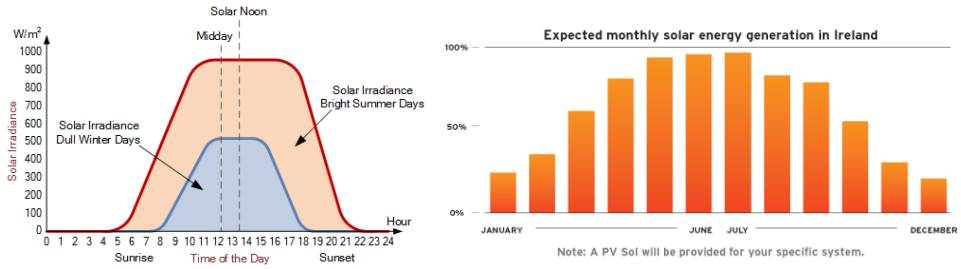
The cost includes paying for solar panels, inverter, batteries, system wiring, and the installation fee.

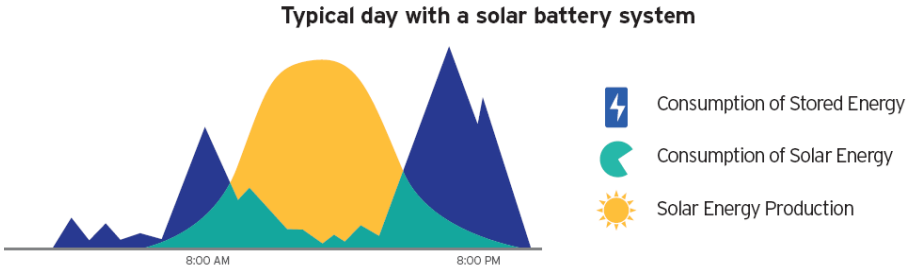
Solar panels may not generate enough energy during prolonged spells of poor weather

Although your solar panels still generate energy during cloudy and rainy days, they may not generate enough energy to meet your home's specific load requirements.

Of course, any power deficit can be comfortably met with the battery stored energy or from the excess energy sent to the energy grid.

Naturally, solar panels work at their optimum during summer months and therefore les solar energy is produced during winter months. The main reason for this is solar irradiance, how long the sunshine's (18 hours a day in summer and as little as 8 in winter months) the sun is also lower in the sky during winter months.





Solar panels may require a large space for installation.

The more energy you need to produce, the more the solar panels will be required. This means that a standard house roof may not be enough to install all the solar panels required.

This challenge can be mitigated by having the installer assess your home or business first before installation takes place.

Are there any Government Incentives for Solar Energy in Ireland?

There are several incentives in place to help Irish consumers make the switch to solar energy.

Basic requirements to qualify for solar grants include that your home must be built before 2021.

Grants of up to €2400 are currently available.

In December 2017, Department of Communications, Climate Action, and Environment (DCCAE) announced Cabinet approval for the introduction of a support scheme for Renewable Heat.

The Renewable Heat Incentive (RHI) allocated about €7 million from the 2018 budget in order to fund the initial stages of the scheme. The first allocation was successfully opened in the summer of 2018. RHI is currently exchequer-funded, and solar-thermal technology is potentially eligible for support under the respective scheme.

The 2019 budget proposed a further measure to support renewable projects, which included an estimated €500 million Climate Action Fund as well as a €500 million Disruptive Technologies Fund.

The Irish government has recognised the positive role played by solar energy as indicated by the adoption of Climate Action Plan and the identification of potential 1.5GW of grid-scale solar power in Ireland by 2030.

Our government remains committed to solar energy and it remains a long-term method of broadening the sustainable energy mix in Ireland.

How Much will it cost for a Solar Energy System in My Home?

The cost of solar panels and the respective Solar Energy system you opt for is dependent on the amount of power you need for your home or business. The amount of power is determined by the size of the load that has to be powered by the solar energy generated.

Furthermore, the cost of solar panels and the energy system also depends on the terms offered by the company carrying out the installation. Other factors may include whether you need a battery for greater efficiency or if your future plans include the purchase of an EV.

The installation contractor will be able to determine whether your roof or selected area offers enough space and is structurally fit for solar panel installation. There are many factors that go into determining the cost of solar energy.

Solar panels in Ireland usually cost between €6000 and €15,000 depending on the chosen system size.

With solar PV you can:

- Reduce your carbon footprint for a cleaner, greener future.
- Improve your Building Energy Rating (BER)
- Receive up to €2400 SEAI grants available.
- Increase the value of your home.

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