# A COMPREHENSIVE SOLAR GUIDE FOR YOUR HOME

Evolution Electrical

# About me...

I have lived in West Bay for 5 years and Bridport before that for 4 years. While I'm considered 'a blow in' locally, my wife was born and raised here and we now have 3 daughters.

I completed my electrical apprenticeship over 20 years ago but left the trade to project manage construction sites in London. During covid I decided that I wanted to work nearer home and went on to renew my electrical qualifications.

Once qualified, Solar PV was an obvious choice to direct my attention. Not only is there a need for Solar Electricians with great prospects but also helping people to reduce their carbon print and their electricity bills.

Over the last 3 years I have personally installed over 200 Solar PV systems all over Dorset and the South West, a large majority of them in the last year. I have also completed many manufacturers training courses and qualified in the following systems.

- Sunsynk - "Master Installer"
- Tesla Powerwall
- SolarEdge
- Emphase
- GivEnergy
- Tigo Optimisers


Plus many others. At the moment a majority of my work is subcontracting for larger Solar companies, but early March we will be MCS accredited opening up more opportunities.

# Getting started...

## Why have solar?

Although many of us aspire to be more environmentally conscious, for the majority the primary motivation behind installing solar is often centered around financial savings and the decrease in electricity costs. This reason may not be as highly praised as reducing one's carbon footprint, but if it reduces your carbon foot print at the same time then it is a win win situation.

**Whatever your decision Evolution Electrical are here to help!**

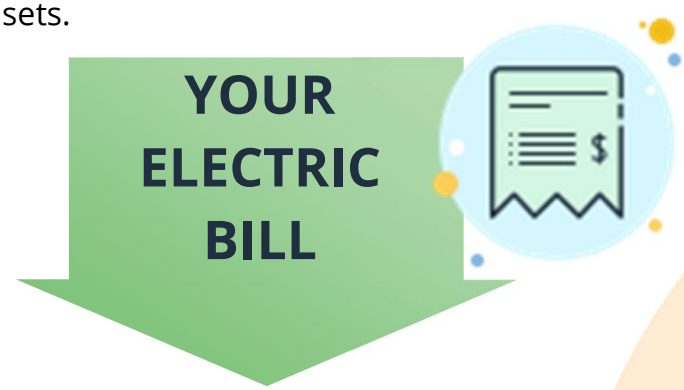
**A typical 4kW system saves around £800 a year on your electricity bill**

# How to decide what you need?

## This means working out how much electricity you use

Examine your electricity bill from the previous year to determine your average daily consumption. Its also worth considering the potential increase in usage if you were to acquire a heat pump, electric heating, or an electric vehicle.

As of 2023, a fully electric UK household typically consumes an estimated daily range of 8.5 kWh to 10 kWh. However, it is important to note that achieving this energy consumption does not require an excessive number of solar panels on the roof, generating 8.5 kW each day. Instead, one can utilize batteries to supplement the energy output once the sun sets.




### Take the following from your electricity bill:

- **Your annual consumption (kWh)**
- **Your unit rate or kWh rate**

Your annual consumption is the most important as the system designer will need this information to design the most suitable system to suit your needs.

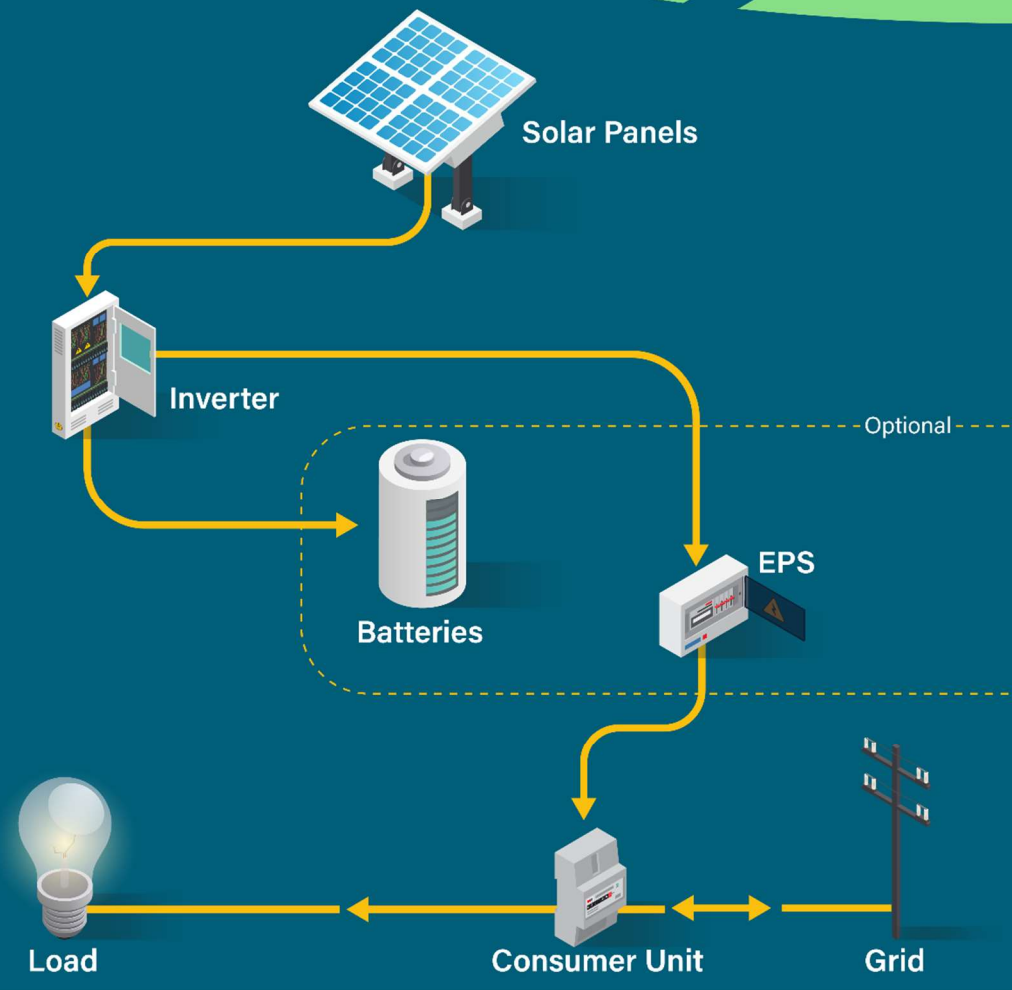
One thing I have noticed about peoples regrets after having solar installed is not fitting on as many solar panels on as possible to start with. To add more panels it normally requires additional scaffold etc. The additional panels will provide that extra needed energy during winter or dull days.

Also, people also wish for more panels in the winter and more batteries in the summer.

# The main components of a solar system?

Here we can see the main components of a solar system. In this document we will cover all these components in detail and more. By the end of this document, you will be a solar expert.

1) **Solar panels**
2) **Inverter**
3) **Batteries**
4) **EPS and other options**




**Lets start from the top and work down...**

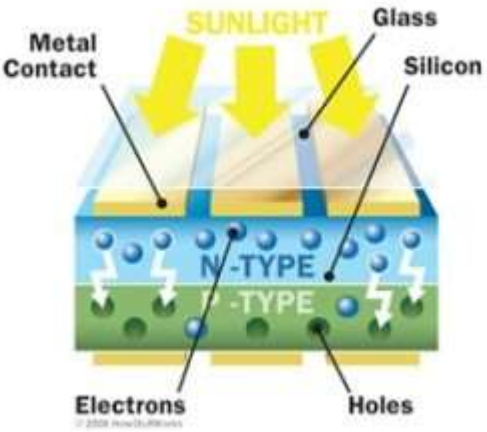
# Solar panels...

# What is this mystical sorcery?

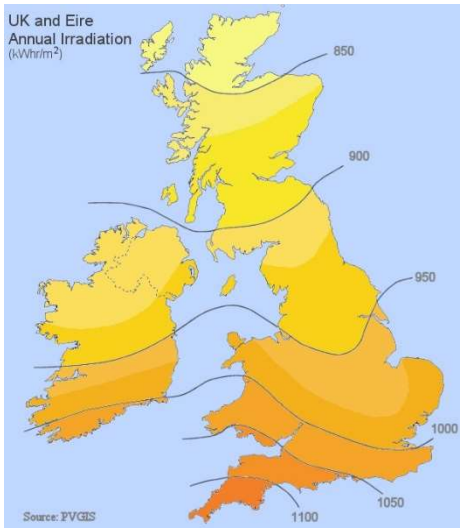
## Photovoltaics Basics (The nerdy boring bit)

Sunlight is composed of photons, or particles of solar energy. These photons contain varying amounts of energy that correspond to the different wavelengths of the solar spectrum.

The PV cells are imbalanced, double silicon layered in order to conduct electricity. Silicon is used because it is a semi-conductor. Therefore, it has similar properties to metal and can insulate electricity. Silicon atoms are put together to create two types of silicon, n-type (negatively charged) and p-type (positively charged). N-type silicon contains spare electrons, and p-type silicon is missing electrons, which create “holes”. When the two types of silicon are combined, an electrical field is created.




When the photons in the sunlight hit the silicon layers in the PV cells, the electrons are knocked off from the atom. The electric field created by the double silicon layers then push the free electrons to the metal conductive plates on the side of the PV cell. Then, the metal plates transfer the electrons to wires, which then transfer the electricity to an inverter. The electricity made by the PV is called direct current electricity (DC).




Irradiance is the measurement of light in an area. Here in the South West, we are luckily enough to receive some of the highest levels of irradiance in the UK. The means solar panels can work well here in Dorset and your roof doesn’t have to be South facing as we will go into future detail later in this document.

**Just remember solar panels work from daylight, not sunlight**

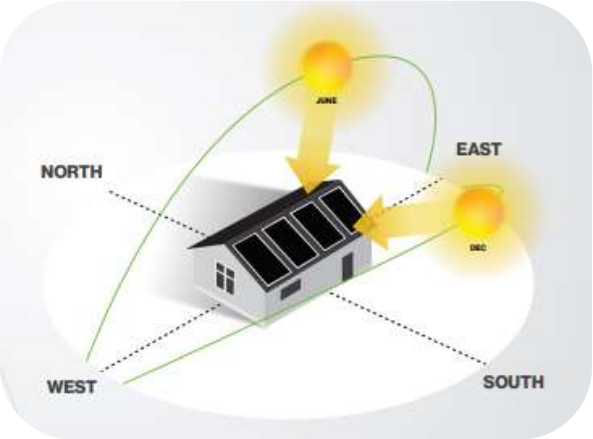
# Solar panels...

## Where to put them?

On your roof, right?  Solar panels need to be mounted in a specific direction to ensure they get as much daylight as possible.

## In the UK, due south at an angle of 35 degrees to the horizon is ideal

This would ensure that the sun shines on them all day, as it rises in the east and sets in the west. It doesn't need to be sunny for your panels to work but the stronger the light, the more power they will produce.




Typically, the optimal location for solar panels is on the roof of your house. In the UK, pitched roofs are commonly inclined at angles ranging from 30 to 50 degrees. These roofs are generally unobstructed by natural shading and provide an ideal position for solar panels. Even if your roof doesn't face south, it is still feasible to install panels facing other directions, including north, albeit with slightly reduced efficiency. Another popular arrangement is to split the panels between the east and west sides of the roof. Although this may require a few additional panels to achieve the same power output, it ensures continuous power generation throughout the day.

The debate surrounding the visual appeal of installing solar panels on rooftops remains a contentious topic. We believe that the black-on-black panels offer a visually pleasing aesthetic. However, you can also have the option to mount them on the ground. By doing so, you can position them at the ideal angle, directly facing due south. However, there is a significant drawback. When mounted on the ground, there is a higher probability of trees, houses, and other tall structures casting shadows on your panels.

# Solar panels

## What you need to know...

**Choosing solar panels doesn't need to be tricky.**
In fact, most domestic installers offer very similar panels, so we've outlined the most important features.

**The things that are most important are:**

### Power output

Solar panels are available in various shapes and sizes. In a residential environment, the most common type is a monocrystalline panel with an output ranging from 380 Watts to 450 Watts. These wattage levels are suitable for domestic use and offer a good balance between performance and cost-effectiveness. While it is possible to find panels with lower or higher wattage, the ones within this range are generally the most economical choice.

### Efficiency rating

The subsequent aspect to consider is efficiency. Efficiency refers to the quantity of sunlight that can be transformed into electricity by the panels. In the UK, each square meter receives approximately 750-1200 kilowatt-hours of solar energy. On average, solar panels convert between 19 and 24% of this energy into electricity. Over a span of 25 years, solar panels tend to lose their efficiency by approximately 0.5% annually, resulting in them operating at 85% efficiency after 25 years of operation.

### Guarantee

The length of a solar panel warranty varies depending on the manufacturer, but a 10 year product warranty and a 25 year performance warranty are considered a bare minimum in the solar industry. Some manufacturers offer a 25-year product warranty and a 30-year performance warranty.

### Half cut

Half-cut solar cell technology boosts the energy production of solar panels by lowering cell size, allowing more cells to fit on the panel. The panel is then divided in half so that the top runs independently of the bottom, generating more energy even if one part is shaded

# What's the difference?

## Polycrystalline or Monocrystalline

You may have seen these terms used before and all they refer to is the way the silicon crystals make up the solar cells - the bit that converts the sun's radiation into usable electricity.

### Polycrystalline

Made with solar cells containing many silicon crystals all mashed together. This makes the panels less efficient, somewhere between 15% and 19%, and gives them their dark blue colour. You still see them on some roofs and on the odd solar farm.

### Monocrystalline

These are the panels you will see in most domestic installations. These contain solar cells made from single silicon crystals, which are much more efficient and give the panels their distinct black colour. Monocrystalline panels should be between 20% and 24% efficient.

### We only supply tier 1 panels, what does that mean?

**Tier 1** - Uses the best grade silicon, manufactured with advanced robotic processes, and generally backed by a 25 year warranty. Manufacturers of these panels also heavily invest in research and development and tend to create all key components independently.

**Tier 2** - Manufactured with partial robotic processes, however there is a chance of human error in the production line which could lead to lower performance of the panels. They benefit from being slightly cheaper than tier 1 panels, however have a lower warranty period.

**Tier 3** - Assembled using other manufacturers' cells, using a human assembly line and manual soldering. They have zero investments in research and development, but still offer warranties for their panels at a lower price point.

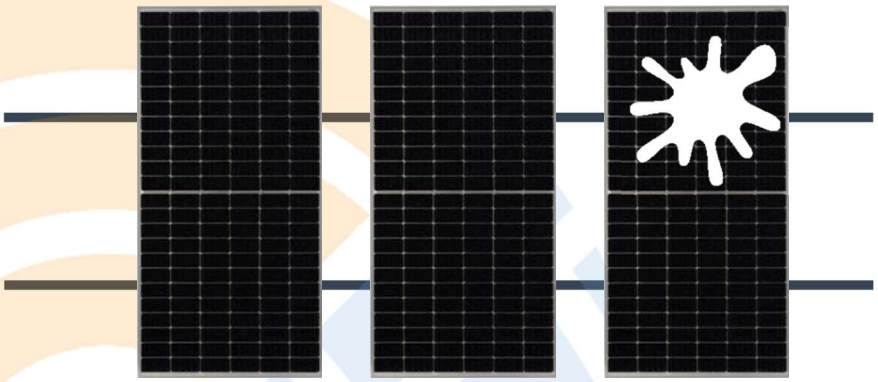
# Shading...

## What is it?

Shading on solar panels is the main factor that affects their performance. Contrary to popular belief, shade poses a significant challenge. The efficiency of a solar array is determined by its weakest panel. Therefore, if one panel is shaded and its productivity decreases, it will impact the overall performance of all the panels.

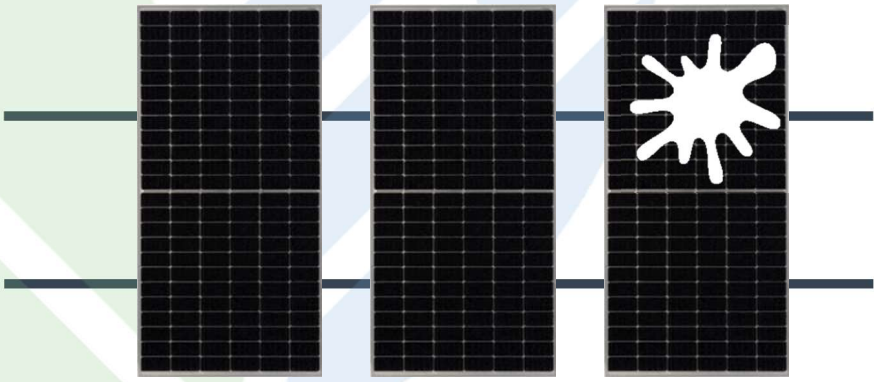
This is where optimisers play a crucial role. These compact gadgets can be connected to each panel individually to minimize the low output and guarantee that the entire array is functioning at its maximum capacity. Additionally, optimisers can assist in dealing with obstructions caused by chimneys, aerials, and other rooftop structures.

### Solar panels in a string without optimisers



50% Output 50% Output 50% Output

### Solar panels in a string with optimisers



100% Output 100% Output 50% Output

# Inverters...

# What you need to know

What's an inverter? The inverter is the brains of the system, it's the clever device that turns the electricity your panels generate (DC) into electricity you can use in the home (AC). That's not all they do though, they can also control where the power goes, to the home, onto the grid or to charge your batteries.

## String Inverters

String inverters convert DC power from your panels to AC power which is used around your home, they tend to have more limited functions and don't have the functionality to add batteries to your system. Almost all the inverters we install are the newer hybrid type inverters.

## Hybrid Inverters

Hybrid Inverters are essentially two different types of inverters all rolled into one. On one side you have the DC to AC inverter, which takes the DC electricity from your panels and turns it into usable AC electricity for your home. But you also have a DC-to-DC inverter, which again takes DC electricity from your panels and turns it into a lower voltage DC for your batteries.

This means if you have a 5kWh hybrid inverter, you technically can handle the power from 10 kW of solar generation at any one-time, excess energy generated will be sent back to the grid automatically. If your inverter is bigger than 3.68kWh, it means you must apply for a G99 (explained further on in this document).

Hybrid inverters require a CT (Current transformer) clamp to work. If the inverter is the brains, the CT clamp is the eyes and hears of the system. The inverter makes decisions based on information fed back from the CT clamp. Which is normally clamped around your incoming supply cables.

# Inverters...
# Important information

## Efficiency

This is important as it determines how much of the power or input DC voltage the inverter can convert from DC to AC. The higher the efficiency, the better but more costly the inverter.

## The kW rating

This is the amount of power that your inverter can supply to your house at any one time. The more electrical appliances you have the larger your house will draw, if this goes over the inverter output you will pull the additional amount from the grid.

## EPS Output

This determines if the inverter can supply to your house in the event of a power outage. Just because it has EPS capability it doesn't mean it will work in a power outage automatically; this is additional electrical work required during installation and sometimes it isn't financially or physically feasible.

## EPS Output Current

This is how much current the EPS output can supply, if you wish to have the EPS option the amount it can supply will determine how much of your house can be emergency backedup in case of a power failure.

## String or Hybrid

If you are considering a battery in the future or want to future proof your system you should almost certainly install a hybrid inverter. This will get the disruption of cable installations out the way all in one turn and also ensure easy upgrades in the future.

# Batteries...

# What you need to know

Batteries can be another great avenue for saving especially when combined with a decent sized solar system. Solar panels on their own are great at powering your home, while the sun is up of course. When the sun sets, you'll have to go back to relying on the grid. With the addition of energy storage, you could be charging those batteries during the day to then use that free energy throughout the night.

## How much battery storage do I need?

Technically speaking you can have as much or as little as you like, but if you want to make the most out of your solar panels, the general rule of thumb is to double the 'kilowatt peak' of your panels. That means if you have a 4000 watt (4kW) system, comprised of ten 400 watt panels, it means your system has a 4 kilowatt peak (kWp), which is the very maximum it could generate based on perfect conditions. In that case you will need battery storage with a capacity of roughly 8-9 kW as your system will generate roughly that amount per day. It's important to note however this is based on you being out most of the day, and so not using the electricity, as that will limit how much the batteries can charge by.

## Grid charging batteries.

Sometimes your solar won't be enough to fully charge your batteries, and that's ok, as you can just as easily charge them from the grid and if you are on a split tariff you can grid charge them at a cheap rate too.

## Why would you do this?

Well, depending on your energy provider, your overnight energy tariff may be lower than in the day, so for example you could be charging your batteries overnight on this cheap tariff, then use your solar throughout the day to keep them topped up, selling any excess back to the grid at peak times for a profit.

# Batteries...
# Important information

## Depth of discharge (DOD)

This refers to the quantity of stored charge that can be effectively utilized. Certain batteries may suffer damage if completely drained, prompting their management system to restrict the withdrawal of charge beyond a specific threshold – some as low as 85%. However, with advancements in technology within the realms of solar and battery storage, an increasing number of batteries are now capable of discharging up to 100% of their capacity.

## Lifecycle

This indicates the number of times a battery can be charged and discharged before it becomes ineffective. Solar batteries typically undergo charging and discharging once or twice daily. Therefore, a battery with a lifespan of 6000 cycles will remain functional for approximately 10 years.

## Warranty

The majority of high-quality batteries typically offer a warranty of at least 10 years. It is also crucial to carefully examine the fine print, as these warranties are contingent upon usage, system specifications, and battery maintenance. If you surpass the recommended number of cycles specified by the manufacturer for the battery's lifespan, it is highly probable that your warranty will become null and void.

## Battery makeup

There are many different types of battery makeups, but LiFePO4, compared to other lithium batteries and lead acid batteries, are extremely safe! They also have a longer lifespan, they require no maintenance, better charge efficiency and improved discharge. They might not be the cheapest lithium ion batteries solution, but they are a smart investment.

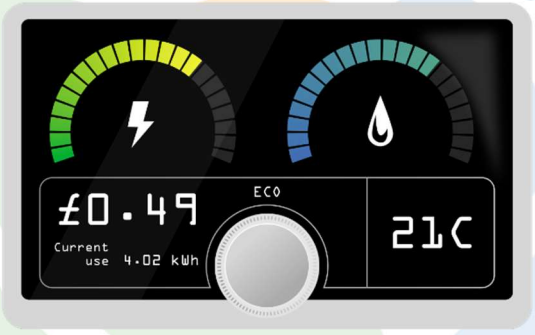
# Do you want to sell your excess energy?

Any excess energy is generally sent back to the grid, In order to get paid for your excess energy there is a couple of things you will need;

- **Choose an MCS registered installer**
- **Have a smart meter installed**

Excess energy is sold back to suppliers using the **SEG** scheme**. SEG** stands for Smart Export Guarantee and is an industry standard scheme. If your system is supplied and installed by an **MCS** approved installer then suppliers are obliged to offer payment on excess energy sent back to the grid. Although Octopus is completing a trail allowing anyone to export back to the grid for a fee.

## Smart meters... Are they really that smart?




Smart meters have moved a long way since their initial release and although they received some negative press at the start they are now worth having. Smart meters help you manage your energy consumption, keeping track of your usage and what you are spending and saving! They also help the grid companies and energy providers manage the grid more effectively which means cheaper rates for everyone.

We won't go into the best tariffs for you as they are very much dependent on the system you have, the specifics of your home, your usage and the company you sign up with.

**It is best to research what is available when you are looking to sign up as the SEG as offers change weekly.**

# Applications and connecting to the grid?

There are 2 types of companies that are involved in delivering energy to your home – the grid provider and the energy supplier.

The grid provider owns and controls infrastructure and the flow of electricity from the power stations.

The energy supplier sources their electricity from the grid provider and sells it to you.

The grid providers want to know about any inverter connections to the national grid and permission can be sought from the grid provider using something called a DNO, or Distribution Network Operators, and they come in 2 forms:

### G98

This is for a 'small-scale system' which must be under 16A per phase, which is the equivalent of 3.68 kWp for a single-phase supply or 11.04 kWp for a three-phase supply. These systems can be installed and then notify the DNO about your installation after installation.

### G99

This one is for bigger systems and that means you are not guaranteed to get permission to feed into the grid at full inverter power and the export limitation might have to be implemented, other restrictions might also be specified. This is because your local network infrastructure might need improving, they also have to keep the grid stable and large generation systems may cause spikes in the supply, which can cause blackouts and other major problems.

Some installers will push or specify a 3.68kW inverter because its easier paperwork. If you are a high user household a larger inverter will cope better with your energy demands and its worth waiting the additional time for a pre-application.

If this all seems a bit much, don't worry as your installer should handle all this for you. Please be aware though, the G98/G99 applications are totally out of the installers hands.

# Do I need planning permission for solar panels?

Solar panel installations fall under 'permitted development rights' allowing homeowners to carry out certain types of construction projects without the need to obtain planning permission. However, there are certain measures that must be met for solar panel installations to be considered within permitted development rights.

## Placement and orientation

Solar panels should be installed on the roof or the external appearance of the building, and the orientation and pitch of the panels should be similar to the existing structure. This ensures that they are integrated seamlessly into the existing structure, allowing for efficient utilisation of space.

## Size and protrusion

The panels should not exceed a certain size and should not protrude more than a specific distance from the roof or wall. This limitation is in place to maintain the visual integrity of the structure and prevent any excessive or obtrusive projections.

## Location and designation

The property should not be situated within a specifically designated area, such as a conservation area or a national park, where more stringent regulations and restrictions may be enforced, but don't be put off, nothing is impossible.

## Noise and glare

The panels should not produce an excessive amount of noise or glare that has the potential to create disturbances or disruptions to the surrounding area.

## Exceptions

There are exceptions to the above these are Listed Buildings, Article 4 Directions, lease hold properties and some areas of outstand natural beauty

# Ongoing monitoring and aftercare for your system...

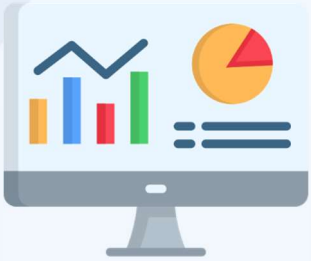
Installing a solar system essentially involves having a miniature power station installed on the roof of your house, requiring you to effectively handle the abundant electricity generated. To facilitate this, installers typically offer a monitoring application that can be downloaded onto your phone or tablet.

The hybrid inverter typically takes charge of monitoring since it is responsible for managing the electricity flow within the system and can be accessed through the Wi-Fi connection, to which your inverter will be linked.

Various applications will provide distinct features that may or may not be beneficial to you. Certain apps will provide extensive data on the efficiency of your specific panels, while others will estimate your future consumption and a few may even assess and evaluate the amount of CO2 saved.

**What you need to know is:**

- **What your panels are generating.**
- **Where that electricity is being directed.**
- **Problems in the system.**



Occasionally systems can experience problems, this can be a real issue and can mean you paying higher electricity bills when your system is down. We monitor your system remotely, so if there was ever a problem, you are notified right away.

**24/7 monitoring for your system**

# What other additional add-ons should I know about?

## Bird guard

Bird guard is usually a barrier that is fitted along the edge of the panels to prevent animals nesting there or chewing the cables while they are exploring. Bird guard is one add-on that is well worth considering while completing the main solar installation as a return visit after might require additional scaffold etc.

## Optimisers

As we mentioned before optimisers are attached to individual panels if they are shaded or not performing well. This isn't just to boost the output of that particular panel, but to ensure that the overall performance of the array isn't dragged down by a single panel.

## Solar diverters

Typically employed to divert surplus electricity towards immersion heaters or hot water systems, these devices are known for their cost-effectiveness within a solar system. This option requires an immersion element on your water tank.

## EV chargers

Electric vehicles (EVs) are equipped with batteries that require approximately 8 hours to charge. So if you have an EV, a home charger is essential. You get dumb chargers and smart chargers. Smart chargers can use your excess solar and charge your car for free.

## EPS Home backup

Its important to understand having solar and batteries wont automatically mean your home is protected against power cuts. There are 3 options that can solve this issue, a single EPS socket normally mounted underneath the inverter, partial home back up of just a few circuits or complete home backup normally by installing an automatic changeover switch.

**Speak to us about any of the above that you would like included in your quotation**

# Does a solar system add value to your home?

Adding value to your home is a common outcome of most home improvements. Whether it's upgrading your bathroom suite, renovating the kitchen, or expanding your living space with an extra room or conservatory, these enhancements contribute to both the functionality and aesthetic appeal of your home.

**However, a solar energy system goes beyond these benefits by not only enhancing the functionality of your home but also providing a means for you to save and potentially generate money.**

Admiral Money conducted some research into how much solar adds to a property's value and found it can be as much as 25%. This means the average house in the UK valued at £290,000, could add a whopping £72,500 onto their house value by adding solar.

**We remain cautious about the 25% additional value but there is no doubt solar will add to the value and desirability of your home.**

Not only adding value it is also improving the EPC (Energy Performance Certificate) rating. EPC ratings are calculated on the energy efficiency of your home, and is measured between 0-100 with categories ranging from A to G. A solar system can add up to 15 points to your EPC rating.

### Future Proofing

Theres no hiding the fact that the world and our homes and consuming more electricity than ever and with the phasing out of gas and the addition of EV our demand is only going to go up, along with the increasing energy costs solar installations are going to play an important part in our futures. So future proofing your home will help you save.

# Accreditations...

## What to look for?

MCS – Microgeneration Certification Scheme.

Although not essential, without the installer being registered with MCS, you will not be able to benefit from any SEGs. However, you can conveniently verify this by visiting the MCS website and searching for the desired installers name. You can find it by accessing 'mcscertified.com/find-an-installer' or simply by searching for MCS and installer on Google. MCS serves as the industry regulator, guaranteeing that all equipment and installers meet specific standards of quality, professionalism, and customer care. Consider it as the solar industry's equivalent of a 'Kite Mark'..

### HIES - The Home Insulation & Energy Systems

HIES, an additional organization established to prioritize your safety, emphasizes both insurance and standards. In addition to safeguarding customers, HIES provides complimentary deposit protection, stage payment protection, and insurance backed guarantees. Moreover, HIES is available to assist in case you encounter any issues with the company that conducted your installation, even if they have ceased operations.

### NAPIT - National Association of Professional Inspectors and Testers.

This is an additional membership program authorized by the government and functioning within the construction industry in the UK. NAPIT registered members are required to demonstrate a superior level of expertise and comply with all NAPIT regulations in order to be recognized as NAPIT members. Consequently, NAPIT takes care of all the challenging tasks while you simply need to search for the badge.

# Energy saving tips...

To make the most of your solar system, it is advisable to make some changes to the way you use your electricity. Below we have come up with a selection of tips to help you on your way.

- **Try to do any energy draining tasks while the sun is shining. Don't put the dishwasher on at night for instance.**
- **Use the weather forecast to help you plan your tasks.**
- **If the appliance generates heat, then it's going to use more energy.**
- **Try not to put two energy consuming appliances on at the same time, like dishwasher and washing machine, as can will cause energy spikes and draw from the grid.**
- **Turn unused electrical appliances off at the socket.**
- **Slow cookers and airfryers can help reduced energy consumption.**
- **Don't over fill your kettle.**
- **Buy a small powered kettle, 2kW one will reduce the pull from the grid.**

Please don't stress about trying to save every last watt of energy but with a couple of small changes you can really make use of your solar system.

# FAQs

### Do solar panels work when its not sunny?

Solar panels do not rely solely on sunlight, but rather on daylight. The efficiency of solar panels increases with stronger light, resulting in a higher yield. However, even with any amount of daylight, the photovoltaic cells within the panels can convert it into electricity.

### Do solar panels need cleaning?

They indeed do, they typically are self-cleaning when they are positioned at the appropriate angle. Rainwater will effectively remove the majority of the usual, everyday dirt and debris. However, you might notice a build up of bird droppings or algae which might require cleaning.

### Do I need a south-facing roof for solar panels?

In the UK, south facing roofs are considered the most optimal for solar panels due to their ability to receive abundant sunlight throughout the day. However, it is still possible to install panels facing other directions. A practical approach is to have a combination of east and west facing panels, which allows for maximum exposure to sunlight from sunrise to sunset. Even a north facing panel can capture a considerable amount of light, although it may experience significant shading during certain times of the day.

### How long will my solar panels last for?

Solar cells degrade at 0.5% per year so, after 25 years, they are still at 80% of their factory efficiency. They can go on producing electricity for another couple of decades. Most panels will come with a 25-year performance warranty.

### How long does it take to install solar panels?

The duration of the installation process varies based on the size of your array. Typically, domestic installations can be completed within a few hours. However, it is advisable to allocate a few days for the entire process. There is a fair amount of work getting cables between the inverter and your consumer unit and also up to the panels.

### Can you go off-grid with solar?

It is possible, although unlikely, to achieve this using a rooftop system in the UK. Due to the limited sunlight during the winter months, the batteries would not receive sufficient charge to last throughout the night. However, if you have sufficient space, you can install additional panels or consider using a separate generator to generate the required power for off-grid living.

# Solar glossary...

**AC /Alternating Current** - Electricity that alternates the direction it flows in 50 times a second.

**AC Inverter** - A device connected to the battery for converting AC electricity to DC electricity to charge batteries.

**Array** - A collection of solar panels, or modules, wired together in series or parallel.

**DC / Direct Current** - Electricity that flows in one direction.

**Degradation** - The loss of efficiency of a panel year over year - 0.5%.

**Discharge rate** - How fast a battery can supply electricity to your home.

**DNO** - Distribution Network Operators - Certificate to give permission to feed electricity into the grid.

**Duck Curve** - A graph showing energy use in comparison to solar generation.

**ECO4** - The fourth update to the governments Energy Company Obligation in which people on certain benefits can access grants for renewable energy systems.

**Efficiency** - The percentage of sunlight that is converted into electricity by a solar panel.

**Energy Price Cap** - The price that Ofgem have set for energy based on availability, demand and wholesale prices.

**Energy Price Guarantee** - The highest amount the government will let energy companies charge you.

**EPC** - Energy Performance Certificate - the energy eciency rating of your home measured from 0-100 with categories from A to G.

**EPS / UPS** - Uninterruptible Power Supply - can be fitted to a solar system to keep the lights on in the event of a power cut.

**EPVS** - Energy Performance Validation Scheme - independent industry body concerned with accurate quotes and saving projections.

**EV** - An Electric Vehicle.

**EV Charger** - A device used to charge an electric vehicle.

**FIT** - Feed In Tariff - a scheme introduced in 2010 and discontinued in 2019 for selling electricity to energy companies.

**G98** - DNO for systems 16A (3.68kW) per phase or less.

**G99** - DNO for systems 16A (3.68kW) per phase or above.

**HIES** - Home Insulation & Energy Systems Quality Assured Contractors Scheme - industry body used to protect customers and their property.

**Hybrid Inverter** - A device connected to the solar array for converting the DC electricity to AC electricity and also converting high voltage DC to low voltage DC to charge batteries.

**iBoost** - A device used to heat water using electricity from your solar system.

**Irradiance** - The power of sunlight in a certain area.

**Inverter** - The part of a solar system that converts electricity from your panels (DC) to electricity you can use in the home (AC).

**Isolator** - Switch to isolate your solar system from the grid and your home.

**kW** - Kilowatt - A Unit of power (1000 Watts).

**kWh** - Kilowatt Hour - How much power an appliance uses in an hour (1000 Watts Per Hour).

**LA** - The Local Authority controlled part of the Energy Company Obligation in which people who conform to certain criteria can access grants for renewable energy systems.

**Lifecycle** - How many times a battery can charge and discharge.

**MCS** - Microgeneration Certification Scheme - an industry body upholding standards in the renewable sector.

**Micro Inverter** - A small device attached to an individual panel for converting the DC electricity to AC.

**Monocrystalline** - Solar cells made from a single crystal of silicon.

**Mounting system** - The system used to attach solar panels to a roof.

**NAPIT** - National Association of Professional Inspectors and Testers. This government approved membership scheme operates within the UK building sector to uphold standards.

**Occupation Archetype** - How often you are in your home - e.g. out at work, work from home, stay at home parent.

**Payback period** - The number of years it will take to save enough money on your electricity bills to o-set the cost of your solar panel system.

**Photovoltaic** - The process of converting light energy into electrical energy.

**Pitch** - The angle of a roof.

**Polycrystalline** - Solar cells made from multiple crystals of silicon.

**ROI** - Return on Investment - how much you can expect to make or save based on your initial financial outlay.

**SEG** - Smart Energy Guarantee - a government backed scheme in which you can buy and sell electricity with energy suppliers.

**Single Phase** - Single-phase power isa two-wire alternating current (ac) power circuit - generally domestic.

**Solar Battery** - A chargeable battery used to store electricity from your solar system.

**Solar Cell** - Inside solar panels to convert light into electricity.

**Solar Optimiser** - A device connected to single solar panels to enhance the performance of the array.

**Solar Panel** - The part of a solar system that converts light into electricity.

**String** - A collection of solar panels, or modules, wired together in series or parallel.

**String Inverter** - A device connected to the solar array for converting DC electricity to AC electricity.

**Sun tub** - A device for mounting solar panels on flat ground or roofs using a plastic 'tub'.

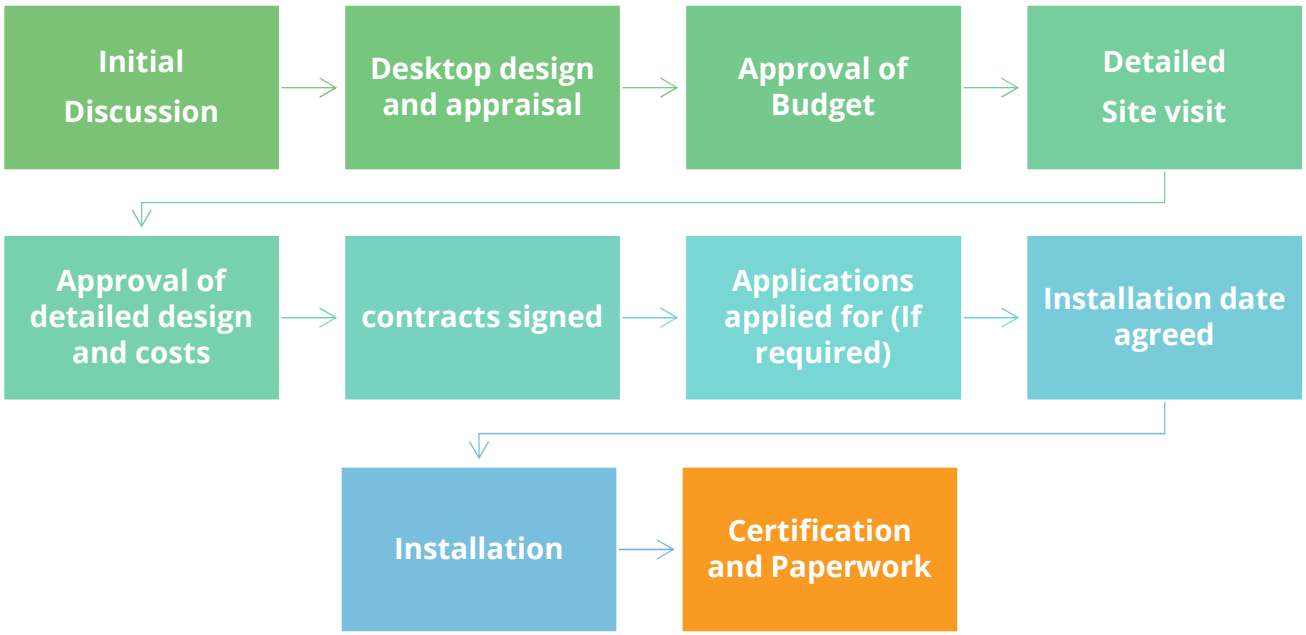
**Three phase** - Consists of three separate conductors that are needed for transmitting electricity generally commercial or high use

**Tier 1 Solar Panels** - Panels manufactured by financially stable companies with vertically integrated production processes.

# What happens Next?

## Our 10 step process

We work to a simple 10 step process towards completion. No matter where you are along this process you can be assured that someone will be available to answer any questions.




## Solar could be installed in as little as 1 week

## Contact us today for a free no obligation quotation


Carl@EvolutionElectrical.uk

www.EvolutionElectrical.uk

07796 926000

# Our Google reviews...

★★★★★ - Andrew Holmes

"Carl first off is such a nice guy. He came as a sub-contractor for a bigger company to fit our solar panel, battery storage and inverter. Despite the rain and cold he worked cheerfully and hard getting the solar panels onto the roof. He also took great trouble to explain the sytem and app fully. My only regret is not dealing with him directly as I'm sure I would have a better system capable of other things. He is not a salesman, just someone who knows his stuff and wants people to have the right system for their needs. I have already recommended him to our neighbours. If you are looking for someone to guide you rather than sell a standard solar panel package don't look any further."

★★★★★ - Sean French

"Carl was really helpful in providing live remote technical assistance to help us set up our inverter after our installer left us with no instructions whatsoever. We've gone from dumping everything to the grid to using the battery as intended. Thanks very much Carl, we really appreciate your support and expertise."

★★★★★ - Charlie Darkins

"Carl and the team did a great job installing our Solar System. Twenty panels all completed within the day setup and running. If anyone is considering having a Solar system installed then I highly recommend Carl and his team. Carl is extremely knowledgeable and sent over a few informative videos before the install and was more than happy to answer my questions during the install and afterwards."

★★★★★ - Benjamin Franck

"I've had solar panels and a battery installed this week, and everything has been done in a very professional way, I had all my questions answered and they left the place as tidy and clean as they found it.
Would recommend to anyone who is in need of a solar panel and/or battery storage installation!."