

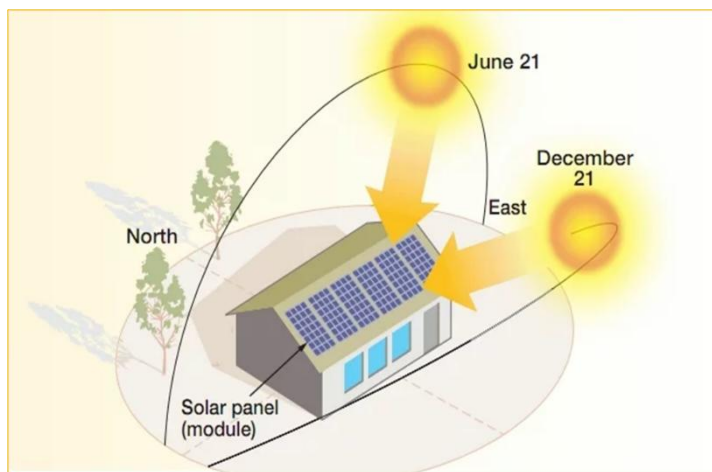
Renewable Energy



Solar photovoltaic (PV) – For community buildings the most common form of renewable energy generation is from Solar PV panels. These turn sunlight into electricity through the 'solar cells' they contain and are made from thin layers of a 'semiconductor' material (traditionally silicon) between layers of glass.

There are three types of panels – monocrystalline, polycrystalline and thin-film, with the first two being the most efficient and longest lasting, but also typically the highest cost.

Systems are rated in kilowatts peak (kWp). This is the maximum rate of electricity the array of panels could generate at peak performance. But a 1kWp collection of panels will rarely (if ever) generate 1kW power. Most of the time the output will be lower. The kWp of a solar array depends on the size, type and number of panels. Electricity leaves the panel as direct current (DC) and passes through an inverter that converts it to alternating current (AC) that can be used in the building.



Key considerations –

- Orientation, angle, shading, wind loading.
- Roof construction and structural stability.
- Heritage consents – conservation area and listed building status.
- Safe access for installation and maintenance.
- Fire safety and Insurance.
- Connection and grid capacity.
- Location of inverters.

Historic England has a great reference resource on installing solar panels on historic buildings [here](#).

Understanding suitability -

CSE has a website called [Solar Wizard](#) where you calculate the potential to generate electricity from rooftop solar panels for buildings in England, Scotland and Wales. It provides a quick and independent prediction about the viability of solar PV on single buildings or groups of buildings.

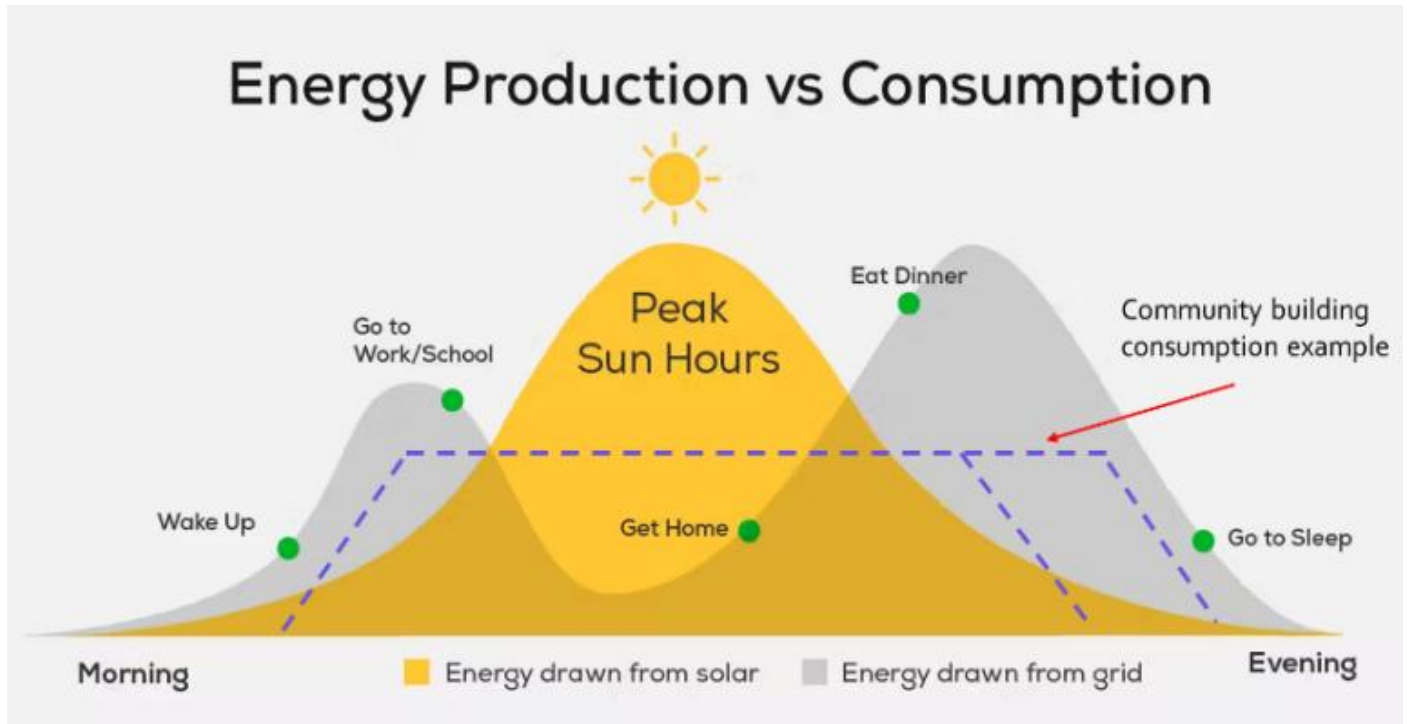
To understand your potential for solar PV we suggest requesting two or three quotes from installers, asking for a technical survey. You may also need a structural engineer to assess to the suitability of your roof.

Heat pumps and solar –

A heat pump can work with the electricity supplied by solar panels; however, the supply and demand of the two technologies are not ideally matched, due to time of use. The peak use of the heat pump may not occur when peak solar generation occurs. The contribution will depend on the size of the PV system and the heat pump. It's possible that a battery could bridge the gap between the two and store the power generated from the solar panels until you need it.



Demand and generation pattern –



Aim to shift demand to coincide with solar production to minimise drawing electricity from grid. Explore if appliances be run during the day instead of at night, and if other activities can move to peak generation times. A solar battery may be relevant; these store the excess power created by the solar panels when the sun is shining. Stored electricity can be used to meet your needs any time of day or night.

Installers -

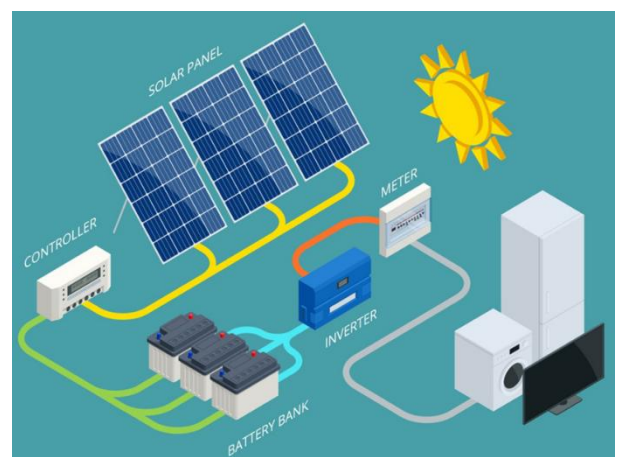


Solar installers should be accredited through the **Microgeneration Certification Scheme (MCS)**, which is the primary standard for quality, competence, and safety in the UK. You can check for accredited companies by searching the [MCS Certified Installer Database](#). Additional trusted certifications include **TrustMark**, **RECC (Renewable Energy Consumer Code)**, and electrical certifications like **NICEIC** or **NAPIT**.

Battery power storage –

- Able to store generated or low-cost energy on site
- Ensure sufficient electricity usage to warrant a battery
- Could enable you to take advantage of cheap-rate electricity, i.e. from a smart time-of-use tariff
- Requires little maintenance: almost 'Fit and forget'
- Likely to need replacing during lifetime of a solar PV system.

Dr Freya Wise at Centre for Advanced Built Environment Research (CABER) at University of the West of England has written some great battery guidance [here](#).



Get more energy advice at www.cse.org.uk/advice