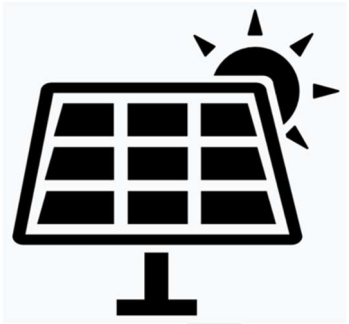
Solar energy for your home



Solar energy is an important source of renewable energy. Radiant light and heat from the Sun can be harnessed as a source of energy for the home using a range of ever-evolving technologies such as photovoltaics (PV) and solar thermal energy (STE).

Solar energy installations require upfront investment, paid for out of long-term savings, so working out the cost effectiveness of an investment in monetary terms can be difficult.

There are additional considerations in terms of planning and development control. Nationally, many domestic renewable installations are normally covered by 'Permitted Development Rights', which means you don't need planning permission. However, because Barningham is within a Conservation Area and many of the houses are Listed Buildings, it is likely that planning permission and/or listed building consent would be required for most developments.

❖ Solar photovoltaic (PV) electricity generation

- Roof mounted solar PV is the most common option for homeowners, typically on a south or near south facing pitched roof.

Roof-mounted (left) and ground-mounted (right) domestic PV systems (each approximately 4kW)

- While it is possible to install roof mounted PV systems in Conservation Areas, usually this would be where the roof faces away from the main focus of the conservation zone. In Barningham, most south facing roofs are visible from the village green, which makes it unlikely that planners would grant permission for PV on those property roofs.

The Rural Community Energy Fund

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- An alternative option is to erect a PV array on the ground, cabled into the property. Small ground-mounted arrays are covered by Permitted Development Rights so don't need planning permission if they meet certain conditions. These include:
    - the installation being no greater than 9m^2 in area,
    - located more than 5 metres from the property boundary,
    - no closer to a highway bounding the property than the house itself, if in a Conservation Area, and
    - the property is not a Listed Building.
- In Barningham, this means that a small ground mounted array may be installed without planning permission in back gardens of some houses. It is always advisable to check with the local planning officer first.
- PV systems typically cost around £4,000 to £6,000 for systems up to 3.7kW. This is the maximum you can guarantee to connect to a single-phase electricity supply without having to pay a grid connection cost. In general, you should expect to generate around 850 kWh to 900kWh of power a year per kilowatt of installed capacity.
- There is now no longer any subsidy for domestic renewable power generation. Whether an investment in PV is cost effective will depend almost entirely on how much electricity you use at home.
- Power supply companies are legally required to offer a 'Smart Export Guarantee' (SEG) to pay you for any exports your PV system generates. This could be a fixed rate or variable, depending on which contract option you choose. Unfortunately, under the current legislation, OFGEM[1] has not set a minimum SEG rate, other than stating it must be 'greater than zero at all times'. Most SEG prices are currently around 4.5p/kWh.
- For this reason, domestic PV schemes only make economic sense if you can use some of the output to cover your own existing demand, minimising the amount that you sell back to the grid via the SEG.
- You may also be able to install a battery system so that you can use the PV output later, as a way of making the investment more financially worthwhile. The economics of this option will depend to a large extent on the usage profile within the property.
- The cost of batteries for domestic solar energy storage typically range from £1200 to £6000.[2] The expected lifespan is 5 to 15 years, which means that the batteries would need to be replaced one or more times over the lifespan of the solar panels.

[1] The Office of Gas and Electricity Markets

[2] Greenmatch, January 2021, https://www.greenmatch.co.uk/blog/2018/07/solar-battery-storage-system-cost

❖ Solar thermal power

- Another potential option for domestic scale renewable water heating in Barningham is solar thermal energy (STE).
- Solar thermal energy systems use free heat from the sun to warm domestic hot water. A conventional boiler or immersion heater can be used to make the water hotter, or to provide hot water when solar energy is unavailable.
- The amount of heat provided is generally too small to contribute to heating your home and this is not normally considered worthwhile.
- Solar thermal systems often look similar to PV panels but require a smaller area and they heat water instead of generating electricity. This feeds direct into a hot water cylinder, which would need to be fitted if you are on a combi boiler. Similar planning issues will apply as for PV panels, so solar thermal systems may not be readily approved for all properties in Barningham's Conservation Area and certainly not on Listed Buildings.
- Solar thermal systems normally cost between £3,000 – £5,000 for a domestic sized system. They are most cost effective in homes that are occupied throughout the day or where there is some level of demand for hot water during the solar production period.
- Solar thermal systems attract Renewable Heat Incentive (RHI) payments (see below).

Roof-mounted solar thermal energy panels: evacuated tube collectors (above) and flat plate collectors (right)
Reproduced from:
https://www.solarguide.co.uk/solar-water-

❖ The Renewable Heat Incentive (RHI)

- Government grants may be available to assist with installation costs, as covered in Factsheet No. 6, *Government schemes to help keep you warm*. This includes details of the Renewable Heat Incentive (RHI) scheme and other schemes for energy efficiency improvements.
- The Domestic RHI scheme provides subsidies for qualifying domestic renewable heating installations, including solar thermal.
- The RHI does not provide up-front grants but instead offers a quarterly payment for seven years following commissioning based on the output of eligible systems.
- You can check whether your property is eligible here:
  https://www.ofgem.gov.uk/publications-and-updates/domestic-renewable-heat-incentive-essential-guide-applicants

  and review the list of eligible technologies here:
  https://www.ofgem.gov.uk/publications-and-updates/domestic-rhi-product-eligibility
- To qualify, the property must have a domestic Energy Performance Certificate (EPC). You must install loft and /or cavity insulation if recommended on the EPC or demonstrate that you meet one of the exemptions, e.g., due to it being a listed building.
- You must select an appliance registered by the Microgeneration Certification Scheme (MCS) and use an MCS approved installer to install and commission it. An electricity meter for payment may also be required.
- The RHI pays a rate per kWh of heat. The current rate for Solar thermal energy systems is 21.49p/kWh.
- The rates are adjusted each year by CPI inflation, although each year the starting rate available for new entrants may be reduced as the RHI scheme winds down.

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