

# Solar photovoltaic electricity generation

The Cotswolds Conservation Board is the body responsible for co-ordinating the management of the Cotswolds Area of Outstanding Natural Beauty (AONB).

The Board believes that there is considerable scope for the generation of renewable energy by householders and businesses in the AONB without harming the beauty of the landscape or traditional buildings.

This leaflet is one of a series providing information about a number of renewable energy technologies which are suitable for the Cotswold landscape.\* Consideration should be given to using more than one such technology in an integrated way to maximise the potential for renewable energy generation at a particular site or building.

The Board encourages everyone to reduce energy use by making their home or office energy efficient, particularly when planning for new buildings or conversions of existing buildings.



\* The other leaflets in the series cover solar water heating, biomass, micro-hydropower, small-scale wind power, and heat pumps

## SOLAR PHOTOVOLTAIC PANELS

### Key points

- Capable of generating 25% of an average household's annual electricity
- Generate electricity directly from sunlight
- No greenhouse gases are produced when in operation
- No air pollutants are produced when in operation
- Can be integrated into buildings
- Good for running domestic electricity appliances and off-grid equipment
- Electricity produced but if it is not required it can be sold back to The National Grid

### How does it work?

Photovoltaic panels convert sunlight into electricity. The electricity generated can be used in the building upon which the panels are sited by a direct connection or by being stored in batteries. Any surplus energy generated can be exported and sold to The National Grid, as long as a property is connected.

Photovoltaic panels have no moving parts and require very low maintenance.



Photovoltaic panels

## Solar photovoltaic electricity generation

### How much electricity can be generated?

The output of a panel will depend upon its siting, construction and the weather conditions. Maximum efficiency is generated from panels facing south in unshaded locations and set at an angle of between 10 and 60 degrees. Typically a panel of 8-16 square metres will be required to generate 1KW of electricity. This would produce approximately 25% of the average Cotswold household's annual demand for electricity.

### Why is photovoltaic generation suitable for the Cotswolds AONB?



Photovoltaic tiles

Photovoltaic panels are typically composed of a number of small tiles fitted together to form a panel of varying area and dimensions. This flexibility allows them to fit to a given situation. Roofing tiles with the appearance of Welsh slate can be obtained which also act as photovoltaic generators. Many properties in the Cotswolds have Welsh slate type roofs either wholly or in part. New roofs, for example on house extensions, would be eminently suitable for such a system.

Panels do not have to be mounted in roofs. They can be mounted in frames on the ground, for instance at the back of a south facing garden.

Photovoltaic panels can also be obtained in cladding materials, which would make them suitable for the roofs of agricultural or industrial buildings or domestic outbuildings.

In all these circumstances the impact on the wider landscape or built environment would be acceptable as the panels can be installed to integrate well with the building or to have little visual impact and because they have no moving parts and are silent in operation.

Where traditional Cotswold stone buildings and roofs are concerned it would not be acceptable for the solar panels to be visible. However, many buildings have central roof gullies or back roof slopes which can only be seen from a limited number of places. In such circumstances it may be possible with care to ensure the character and appearance of the buildings are not harmed. This is particularly significant when dealing with listed buildings or in conservation areas.

Planning permission and listed building consent from your local planning authority may be required.



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