

# Resilient Building Toolkit Adaptation Measures Factsheet

## Name and description of measure: Solar electricity and photovoltaics

Solar panel electricity systems, also known as solar photovoltaics (PV), capture the sun's energy using photovoltaic cells. The cells convert the sunlight into electricity, which can be used to run appliances and lighting. The cells don't need direct sunlight to work – they can still generate some electricity on a cloudy day. Although for the best results, the PV arrays should face within 45° of south and be inclined at an angle of 30° of the horizontal plane.

PV modules can be designed into the building envelope, for example, replacing walling, cladding or roofing components, or can be mounted separately on purpose-built frames. Thin film solar cell can be applied to materials such as glass or metal.

### Cost of measure (high, medium or low):

High with payback period of 10-30 years. Approx. £6,000 is a conservative estimate installed cost per kW rated output. Although there may be the opportunity for grant funding and feed-in tariffs, information can be found on the UK government's website <https://www.gov.uk/green-deal-energy-saving-measures>

### Pros and Cons:

#### Pros

- Efficient source of zero carbon electricity.
- Reliable tried and tested technology.
- Low maintenance.
- Silent.
- May be eligible for government Feed in Tariffs.

#### Cons

- Expensive to fit with long term pay backs.
- PV arrays need to be free from shade. Even a small amount of shading can dramatically reduce the electrical output of a PV array.
- Roofs must of a suitable type and strength.

### Effectiveness of measure (high, medium or low);

High for buildings where electricity is needed year-round in daylight hours, as electricity generated can contribute to a building's daytime demands. If more electricity is generated than the building needs, this energy can be exported to the National Grid.

### Photos;



**Product review site:**

Energy Saving Trust: <http://www.energysavingtrust.org.uk/Generating-energy/Choosing-a-renewable-technology/Solar-panels-PV>

Carbon Trust: <http://www.carbontrust.com/media/81357/ctg038-a-place-in-the-sun-photovoltaic-electricity-generation.pdf>

**Link to case study and contact:**

Low carbon buildings case study: <http://www.energysavingtrust.org.uk/Publications2/Housing-professionals/New-build/Low-carbon-futures-zero-carbon-case-studies>

The University of Winchester has installed Solar PV on its buildings, contact Mat Jane, Energy and Estates Manager. <http://www.osborne.co.uk/assets/files/burma-road-winchester-uni.pdf>