

# Richmond Environment Network

## Sustainability Briefing Paper – No. 4 – Solar Photovoltaics

# Generating Electricity From Sunlight

### What are Photovoltaics?

Photovoltaics, or PV for short, are a solar power technology that uses solar cells or solar photovoltaic arrays to convert energy from the sun into electricity. Solar cells produce direct current electricity from the sun's rays, which can be used to power equipment or to recharge a battery. Solar cells can be found on a range of equipment from pocket calculators to spacecrafts.

When more power is required than a single cell can deliver, cells are generally grouped together to form 'PV modules' that may in turn be arranged in



'solar arrays' which are sometimes referred to as solar panels. Confusingly, the term 'solar panels' is also used to refer to tubes, which heat water using energy from the sun, though the technologies are completely different from each other (see also Briefing Paper No. 3, Solar Water Heating). Photovoltaics work on light, not heat – indeed, they often work best on a cold bright day.

### Steps to consider

Consider your property and think about options for renewable energy. If your roof is shaded, or not approximately south facing, then solar power may not be as cost-effective, and if it is sheltered from the wind then wind power will probably not be ideal. If in doubt about which type of renewable energy to choose, contact Richmond's Energy Advice Centre, run by Creative Energy Networks (CEN), which will be able to provide impartial advice and recommend accredited installers (all contact details are given below).

CEN will help you get a survey done by a solar installer. The installer should check the orientation. East-west orientation should work satisfactorily, but with less output than a south-facing roof. CEN should also find a suitable location for installing an inverter which converts the direct current into alternating current. They should also provide a quote covering the installation and any required scaffolding work. Proper, accredited installers must also give you an indication of the grant for which you should be eligible from the Energy Savings Trust. If you are happy with the installer's quote, you can accept it subject to grant approval, but you may need to pay a deposit.

Check the Council's position on installing PV. If you live in a conservation area, or if the side of the roof upon which you will put your panels faces the road, you may require planning permission. Some roads will only need planning consent, which is cheaper and easier to obtain.

## Grants

Check with your electricity company that you can sell any excess electricity back to them, for which you may need an export meter installed. If they are not helpful, it may be a good opportunity to change your electricity provider. You could use Good Energy as they provide electricity only from renewable sources. They have a good scheme whereby they pay for all the electricity you generate whether you use it yourself or export it to the grid.

If your application form for a grant has been accepted by the Energy Saving Trust, they should notify you and you can then give your installer the go-ahead and agree an installation date. The installer should take less than a day to install your PV, though scaffolding may need to be put up a day or so before and taken down a few days afterwards.

You should take an electricity meter reading from your normal electricity meter and notify it to your electricity company with details of your PV meter. You should then notify the Energy Saving Trust that the installation has taken place so that they can pay you the grant. Some time later you may be asked by your electricity company to register yourself as a micro-generator with Ofgem, the Office of Gas and Electricity Markets.

## Costs

Costs of the installation will vary according to the size of the solar array and the scaffolding. For the average domestic system, usually between 1.5 and 3 kWp, costs can be around £5,000- £8,000 per kWp. Grants are currently available but they will only cover an overall maximum grant of £2500 or 50%, whichever is lowest.

## Local solar electricity

Richmond Fire Station is the first fire station in the country to be benefitting from solar photovoltaic installation. In total 80, 190W photovoltaic modules were installed on three areas of the fire house: the roof windows, the flat roof and the pitched roof. This

will generate 12,000kWh electricity per year and save 6.5 tonnes of CO<sub>2</sub> emissions in the same period, meeting all the station's needs for electricity - and exporting some back to the national grid.

## Conclusions

Overall, the advantages of photovoltaics are that once installed, they can function without noise or significant visual intrusion for many years while saving up to a tonne of CO<sub>2</sub> per year. The disadvantages are that the energy output will vary considerably throughout the year and the pay-back period is quite long. However, the technology is constantly improving and costs may come down significantly in the next few years.

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## Contacts

**Richmond Energy Advice Line**  
0800 358 8588

**Energy Saving Trust**  
[www.est.org.uk/](http://www.est.org.uk/)

**Good Energy**  
[www.good-energy.co.uk/](http://www.good-energy.co.uk/)

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All recommendations within this leaflet are offered in good faith, with the benefit of related experience and knowledge. However, if you choose to carry any of them out, you do so entirely at your own risk. REN are unable to accept any responsibility for loss or damage resulting from such action.

## Richmond Environment Network

Linking, supporting, developing & promoting local environmental and sustainability activities.

Website - [www.richenvironmentnet.org.uk](http://www.richenvironmentnet.org.uk)

Email - [info@richenvironmentnet.org.uk](mailto:info@richenvironmentnet.org.uk)