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## Solar Panels (Photovoltaic Cells) and Environmental Conservation

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### Introduction

Photovoltaic (PV) cells use light to generate electricity. Installed on a church, they can supply some of its needs and provide an income from selling surpluses via the government's Feed-in Tariff. They can promote ***Shrinking the Footprint***, the Church of England's campaign to reduce its carbon emissions through using renewable energy, setting an example of witness to the wider community.

Parishes are strongly advised to talk to the Diocesan Environment Officer and DAC Secretary when first contemplating a scheme, and to take professional and technical advice in developing it.

This leaflet mostly focuses upon listed historic buildings, but it can apply equally to non-listed buildings of merit, particularly those in conservation areas.

### Locations

Many churches have south-facing roof slopes on which the strongest sunlight falls. On these, installations invisible from all adjacent viewpoints are likely to be acceptable. Potential locations include a south aisle roof concealed by a parapet, and the roof of a tower, though space on the latter may be limited. The location must be large enough to make a worthwhile long-term electrical contribution, and be safely accessible for maintenance. The proposed roof area should not be shaded by adjoining buildings, the tower or trees in the vicinity throughout the four seasons of the year, as most systems stop producing electricity if any part of the system is shaded.

Ground-mounted panels, which have been used within the curtilage of some domestic listed buildings, are unsuitable for a churchyard due to the risk of theft or vandalism.

### Fixings

Two systems are currently available. The first consists of modular cell units in a metal frame attached to the roof without drilling through the tiles or metallic roof covering. The strength of the roof should be checked to ensure that it can take the additional weight. Promoters of this system see it as likely to have at least a 30-year working life. Maintenance of the original roofing material underneath the panels ought still to be possible, and renewal of the system should cause minimal disturbance to the roof structure.

The second system, using solar slates instead of the existing roofing material, is generally more expensive to install. It is less suitable for historic buildings because it has a shorter life-span than the historic roofing materials around it. Though the slates do maintain the profile of the roof, they are likely to be more shiny and reflective than adjacent original materials, a less 'honest' addition to the building, and less easily reversible.

Recent guidance issued by English Heritage '*Small scale solar electric (photovoltaics) energy and traditional buildings*' (see below) is firmly in favour of the first approach.

### Considerations

Parishes must demonstrate their need and that the panels will not detract obtrusively from the character and significance of the church. There is a legal presumption in favour of managing change to historic buildings so that their character and appearance is conserved.

PV panels on a church roof are only one of several potential energy-saving measures. Before considering installation, others should be carefully reviewed, perhaps through carrying out an Energy Audit. In short, where there is a limited 'green budget' there may be more cost efficient ways to reduce carbon emissions. As fuel costs are likely to rise year on year at a much faster rate than inflation, a cost/benefit analysis is an important consideration.

The size of PV arrays that can realistically be installed is unlikely to meet all peak-time requirements. In practice, the church would first draw energy from PV-generation and then use the mains supply to make up the shortfall. When the church is not in use, ALL electricity

generated will go to the supplier. Generation tariff will be paid for all, and input tariff on 50%, of amount generated irrespective of the amount used.

Parishes seeking to benefit from the Feed-in Tariff should contact with their electricity supplier at the outset to ensure that the installation will qualify for it. They should also find out whether the electricity meter would have to be changed and establish whether there is space protected from the weather, preferably inside, for an inverter (transformer) and certified generation meter which come as part of the supply package. As the Parish will have to read the meter quarterly it must be easily accessible.

In balancing environmental and financial costs and benefits, parishes should bear in mind:

- (i) In the current climate of very low rates of interest on savings the economics can compare very favourably.
- (ii) The Feed-in Tariff is a scale which declines according to the year the system is installed (but held for the life of that installation).
- (iii) The technology is rapidly developing and prices may well fall. Thus as the years pass, the development of the technology may be counterbalanced by the lower tariff.
- (iv) Suppliers are in business to sell systems; their claims should be evaluated carefully. All installations (equipment and labour) must be certificated under the MCS (Microgeneration Certification Scheme) to qualify for Feed-in Tariff payments.
- (v) PV cells are not carbon neutral, due to the amount of energy required to manufacture them. All relevant costs should be taken into account, including manufacture, set-up, maintenance, renewal, de-commissioning and disposal.
- (vi) Installation on some listed churches may be too difficult to achieve without adverse visual impacts on their character and appearance. It may also require the lopping or felling of nearby over-shadowing trees. Both these aspects will be of interest to the wider community. Avoiding such impacts by not installing PV panels in its own way contributes to environmental conservation.

It is most improbable that another type of fitting, solar hot water panels, will prove to be economically viable for churches because of their relatively low usage of hot water.

### **Permissions**

A Faculty is always required for the installation of PV cells. In advising the Chancellor, the DAC will consider each proposal in its merits. It will also require sufficient information about fixings, fixing points and cable runs to ensure that there will be no immediate or long term-term damage to the fabric of the church.

Installing PV cells that affect the external appearance of a listed building requires planning permission. Preliminary enquiries should be made at an early stage in case it is unlikely to be granted by the local authority or supported by English Heritage.

If the installation of equipment and cabling is likely to have any impact on the churchyard, its trees, lichens, flora and fauna, or is likely to disturb any bat roosts, this will need to be taken into consideration in the appraisal of the scheme. The Diocesan Environment Group and the DAC will be able to offer advice on these aspects.

### **Useful web sites**

[www.english-heritage.org.uk/publications/small-scale-solar-electric-photovoltaics-energy/](http://www.english-heritage.org.uk/publications/small-scale-solar-electric-photovoltaics-energy/)

[www.shrinkingthefootprint.cofe.anglican.org/](http://www.shrinkingthefootprint.cofe.anglican.org/)

### **Additional information and advice is available from the DAC team:**

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