

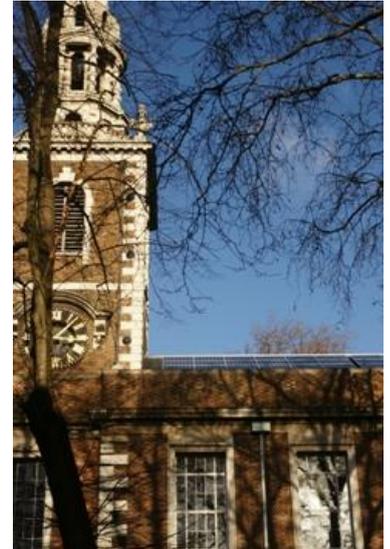
Solar panels

This page forms part of the Diocese of London's *Shrinking the Footprint* microsite.

Solar panels projects contribute to the Diocese of London's [Climate Action Projects](#), and thus form part of its strategic plan to address the challenge of energy use and carbon emissions from its buildings. See also [Route 2050](#) and [Generic Building Solutions](#).

Climate Action Projects aim to cut the energy use of churches across the Diocese by at least 20.12% by 2012, 42% by 2020 and 80% by 2050.

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St Mary Islington

Photovoltaics

Photovoltaic (PV) systems are solar panels (or variants such as solar tiles and thin films) used to generate electricity, a contribution to renewable energy generation.

The Diocese of London encourages churches to consider installing solar PV systems. Churches often have large south-facing roofs.

The cost is reducing substantially, by at least two-thirds since 2009/10. It is most viable when a roof needs replacing or major repairs anyway, as scaffolding costs are saved. In such a case, the possibility of solar PV should always be considered.

Download a straightforward summary here:

 [Generating your own energy](#)  

Projects

Thirteen premises in the Diocese of London so far have installed solar PV systems:

Churches

- [St James Piccadilly](#)
- St John the Evangelist, Brownswood Park
- [St Mary Islington](#)
- [St Silas Pentonville](#)
- [St Hilda Ashford](#)

- All Hallows Gospel Oak
- [St George Southall](#).

Church Halls

- [St Mary Spring Grove](#)
- St Aldhelm Edmonton
- St Michael Wood Green.

Parsonages

- [St John Wembley](#) (part of zero-carbon house)

Parish almshouses

- St Mary Ealing

Schools

- St Mary Finchley Primary.

At least 50 other solar PV projects are progressing or under consideration at various stages, in the Diocese.

This includes the potential fruits of a systematic study identifying suitable church or parsonage sites, beginning with south facing roofs away from the road, on unlisted buildings which are not in conservation areas.

Case studies may be downloaded here:

 St Mary Finchley School	
St Mary Spring Grove	
St Silas Pentonville	

Solar hot water

Solar hot water systems, commonly domestic in scale, use the sun to heat water directly, for circulation or storage in a hot water system. A number of suppliers offer packages including the storage cylinder.

The panels themselves derived originally from adaptation of central heating radiators, and may consist of flat panels or tubes.

Feed-in tariff

Solar PV systems currently benefit from the government's [Feed-in Tariff](#) (FiT), which offers a return for each unit (kilowatt-hour, kWh) generated (the rate depends on the capacity of the system); and an additional 3.1p export tariff on top, for each kWh not used but fed back into the grid (usually deemed to be 50% of the total).

The original very generous FiT rates applied to systems installed, registered and running by 3 March 2012, and are still to continue for those systems for 25 years after their installation (index linked).

The rates stepped down (to a maximum of 21p per kWh) from 1 April 2012, for all installations after 3 March.

Rates will again step down on 1 July and 1 October 2012, then six monthly after that, for new systems after each date. The level of these 'degressions' remains to be determined following consultation.

Rates are further reduced (to 9p per kWh max) for premises without an Energy-Performance Certificate (EPC) Grade D or better. EPCs are inapplicable to churches, so this requirement has been queried. It may in any event be waived where a PV installation is on a church roof without EPC grade D, but wired solely to premises (eg a church hall) which do have EPC Grade D.

Rates are also 20% less for estates once they have installed 25 PV installations.

At least for the time being the export tariff remains at 3.1p per kWh. This is being reviewed (and might go up).

It is best to use as little electricity as possible, even though it is generated on site – but to concentrate that use during daylight so as to minimise what is taken from the grid (which saves about 13-14p per unit at current prices). Churches should consider the possibility of installing an export meter if, even after that, their consumption of PV generated units is expected to fall short of 50%, leaving more than 50% to export.

The lifetime of the tariff for new schemes, currently 25 years, may reduce to 20 years. Arrangements for index linking are also being reviewed.

Download the Diocese's responses to the Phase 1 and 2A consultations:

 Phase 1 response 

Phase 2a response 

Finance

See [Climate Action Finance](#) for finance options, and information about VAT.

Bearing in mind that any solar panels scheme can take a year or a bit more of determined effort to bring to fruition, it is well to take account of future Feed-in Tariff rates (see above) in projecting income for PV in relation to costs and therefore the payback time. There is considerable benefit to be had in commencing as soon as feasible, rather than waiting for the FiT to erode through future degressions; although costs are still reducing too.

Payback times may currently be anything from 15-50 years, depending on the parameters of the particular project. Viability depends on availability of grants or existing capital, whether any loan needs to be serviced, or an investor is expecting a minimum return.

Financing schemes dedicated to solar panels are now being developed. The Diocese can provide an introduction. Contact [Head of Environmental Challenge](#).

Grants from public bodies may in some circumstances forfeit the Feed-in Tariff, but in most cases the income projected which is based on calculations for the previous three years and the next three years will fall below the De Minimis limit, and therefore remain eligible for any grant as well as the FiT.

Permission

To install solar panels on your church (or most other buildings) you need planning permission, as well as a faculty – prior to which you should seek the advice of the Diocesan Advisory Committee (DAC). See [faculties](#).

The DAC grants automatic recommendation in certain defined cases, all others being considered individually on their merits.

Solar panels do not always need to be hidden from view; this is considered on a site by site basis. Whether seen or not seen, they should be well designed and appropriate to the situation.

A fuller review of issues concerning appearance, permission and other factors to consider, may be downloaded below.

Local authorities are now required to follow the government's new National Planning Policy Framework, which may also be downloaded below (search for 'renewable'). Nevertheless it is essential to consult your local Council at the outset. Be prepared to make a strong case.

 Solar panels strategy 

[Planning Policy Framework](#)

Installation

Installers of PV systems are required to belong to the [Microgeneration Certification Scheme](#), in order to qualify for the Feed-in Tariff. This provides some assurance of competence. The [Head of Environmental Challenge](#) can suggest suitable companies, but selection and appointment is the decision of the property owner, or in the case of a church the Parochial Church Council.

Installers should follow codes of practice, in particular from [Building Research Establishment](#) (BRE).

A project to install solar panels may form part of works subject to the Construction Design and Management Regulations (which concern health and safety of building contracts). [This guidance](#) should then be followed.

Registration

To receive the Feed-in Tariffs, your PV installation must be registered with the Central FiT Register. Your installer may be able to undertake registration, but it does not have to be your installer – it could be your electricity supplier, or another utilities company even if not your supplier. To be able to do this, the organisation concerned just has to have an approved registration number.

Electrical safety, maintenance and fire

To ensure the safety of a solar PV system, several points need to be attended to by contractors, professional advisors, PCCs and/or premises managers involved. These should not then present an obstacle to any PV project:

- PV systems have inverter(s) to convert the DC current generated into mains voltage AC to use in the building or export to the grid. Usually there will be a transformer to step up to mains voltage. The AC output from inverters must be at the correct voltage, frequency and phase relationship with the mains. Usually an inverter includes a protection relay and circuitry to ensure synchronism. In the event of mismatch, the system must be immediately disconnected from the mains. Make sure to check with your installer that this is done and maintained correctly.
- In regular operation, a PV system should not need to be switched off or disconnected, eg for maintenance. If the panels are double insulated and correctly earthed, they should be safe to handle. However this should not be taken for granted with every system – if in doubt, ask! During daylight, there might be a risk of shock from the panels. The risk may even be greater if the panels are disconnected – the PV panels will still generate as light falls on them, and effectively (if not earthed) build up a reservoir of charge with nowhere to go.
- Maintenance should be specified by the installer. For panels at a suitable pitch, frequent cleaning should not be needed; they should be reasonably self-cleaning in the rain (when it does rain!). If cleaning is needed (performance may otherwise drop), it may be done by competent persons. There should be a method statement approved by the installer, operatives should be fully informed of it and it must be followed. Subject to the points above about safety, cleaning with water is usual. Solvents should not be used. Equipment is available from companies such as www.cleansolarpv.co.uk.
- If there is roof maintenance near the solar PV panels (rather than to the PV system itself), workers may not know about the panels. They must be briefed about any safety issues, and if necessary the panels covered with a thick cloth (for example). Suitable protection will in any case guard against impact damage.
- The above conditions apply to framed PV panels. Their applicability to other variants such as PV tiles, thin film and building integrated systems (eg in walls or flat roof finishes) should be verified with the installer of the particular system.
- There are also significant implications for fire fighting. The local fire brigade needs to know the PV system is there. It should be informed when it is installed. There may need to be eg a notice with phone numbers and firefighter's switch(es) near the entrance for when firefighters arrive, in the event of an alarm.
- In the event of fire, this could be caused by the PV system, though that is considered unlikely. Or it could have nothing to do with the PV system – but its presence might constrain the method of fire fighting. Firefighters will likely require to disconnect the AC supply anyway. This will take the inverters off load. Disconnecting the DC side might be advisable, to restrict the area of potential damage to the system, or the risk of shock to fire crews – though it might increase the current flowing through any fault.
- Electrical fire should not be fought with water hoses. Otherwise, hoses may be safe to use when there are solar panels.
- In relation to the last two paras, decisions on what to do are for the fire service, so long as they can get answers to questions quickly on arrival. Fuller information about fire-fighting and solar panels may be found [here](#).

The installer of any new system should be asked to advise on the foregoing in individual circumstances, and to specify any future tests and maintenance.

The building's insurers must also be informed.

'Free' solar panels

Churches and other property owners are occasionally approached by companies offering 'free' solar panels, delivering 'free' electricity to the customers, in return for assigning the Feed-in Tariff to the installer. In some cases the customer also receives a rent.

It is often claimed that the division of reward is weighted too heavily towards the supplier without a fair share to the site owner. However this may not always take account of the economics, specifically the 'opportunity cost' of the provider's finance.

On the other hand, the fine print of such deals can be rather vague. To get through faculty, they would need close scrutiny and potentially tightening up. See the national [Shrinking the Footprint website](#) for a critical review of some of the issues with these offers.

There are not known to be any such installations completed in London Diocese yet. The Diocese will seek to maintain the balance between encouraging solar panels and making sure they are done right.

Bear in mind, several schemes have been completed where parishes have raised their own finance, kept hold of the whip handle and are now deservedly reaping the benefits. It can be done!

To learn more

The third in a series of articles by the Head of Environmental Challenge published in RICS Building Conservation Journal, including a case study of the solar panels at St Mary Islington, may be downloaded here:



A sunny
outlook



To discuss

To talk through any project, contact:

- [The Head of Environmental Challenge](#); 020 7932 1229
- [The Care of Churches Department/DAC](#)
- [Your archdeacon](#)