CLASP. Climate Change Local Area Support Programme

Planners' reference guide no. 10: Solar PV

Introduction

Solar PV turns solar energy into electricity, replacing a high carbon fuel. PV systems are simple systems and once installed, require very little maintenance.

There are a range of different types of PV cells and mounting types. Most retrofit installations are mounted directly onto a sloping roof, or on angled frames on a flat roof, but they can also be integrated into the building fabric e.g. as tiles, or within glazing, or can be installed as a stand-alone ground mounted system.

PV installation issues:

- Orientation: pitch facing between SE and SW and on a 30 - 40˚ angle is optimal
- Avoid shading
- Ensure the roof can support it
- Protect from damage and theft

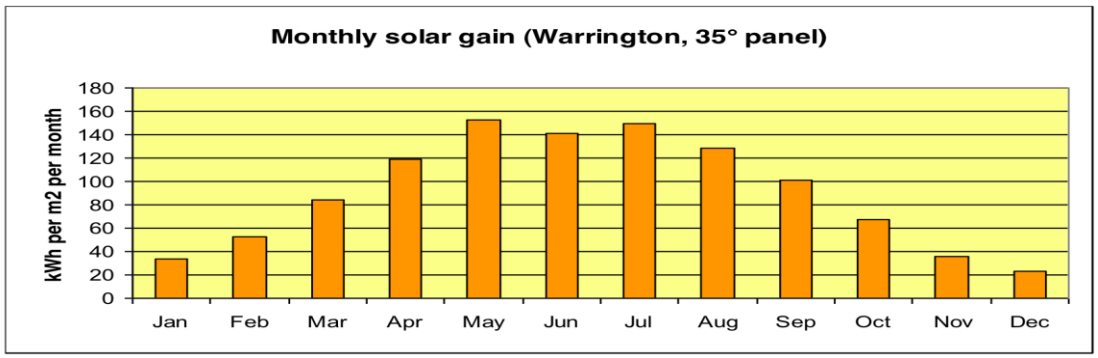
The main issue for occupants is making best use of the energy when it's being generated, which for domestic systems might mean planning to use electrical equipment when the sun is shining.

Most PV systems are guaranteed for 20-25 years for the panels, but the inverter will need replacing after about 10 years.

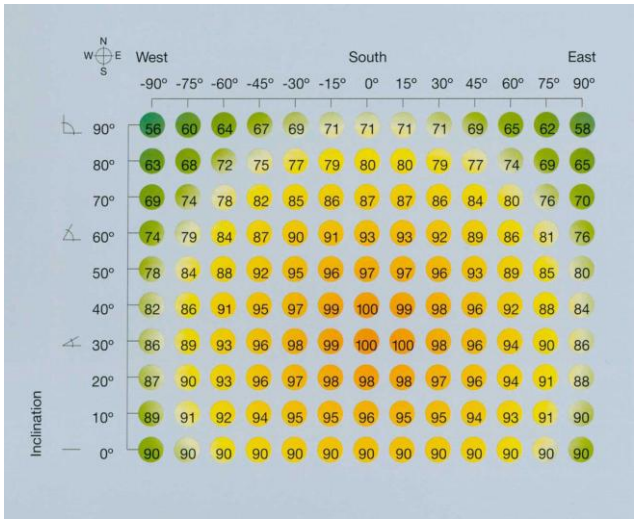
Rating & output

PV panels a rated in terms of peak output (kWp). Actual output depends on location and panel efficiency, but in the North West (NW) should be in the range **750-900 kWh/kWp** per year.

A typical output profile across the year is shown below



The table below shows the reduction in output due to non-ideal orientation:



Dimensions

Panels are usually between 1.2 – 1.7 m2 and weigh 13-15kg/m2.

Related to size, output varies from 80-120 kWh/m2.

Grid connection

For small systems (< 16 Amps per phase, or roughly 11.4 kW for 3-phase connection) the installer is only required to inform the Distribution Network Operator (DNO) that the connection will happen. For larger systems a grid connection report must be requested from the DNO, who may charge a fee of around £2,000 - 4,000 for this service. If any grid connection strengthening work is required, there will be an additional cost.

Costs

Price ranges for different size systems are given below (as at June 2011). Prices per kW installed have decreased by over 30% in the last 3 years.

Costs - Installed £/kWp	Min	Max
Small Domestic System <2kW	5,000	5,500
Large Domestic System 2-4kW	4,000	5,000
Small Commercial System 4-10kW	3,500	4,500
Larger Commercial System 10-50kW	3,000	4,000

Feed in tariff (FIT)

The FITs have driven a huge increase in the PV market, and have brought the payback down to around 9-11 years for a typical roof-mounted system. To qualify for FITs the system must be installed by a Microgeneration Certification Scheme (MCS) accredited installer. Schemes over 50kW need to apply for accreditation through Ofgem's Renewable and CHP Register. FIT rates to March 2012 are shown below (rates for >50kW systems valid from 1st August 2011):

Technology	System Size	p/kWh	Years
PV	≤4 kW (new build)	37.8	25
PV	≤4 kW (retrofit)	43.3	25
PV	>4-10kW	37.8	25
PV	>10 - 50kW	32.9	25
PV	>50 - 150kW	19.0	25
PV	>150 - 250kW	15.0	25
PV	>250 kW - 5 MW	8.5	26
PV	Standalone system	8.5	25

Planning considerations

Domestic PV in the plane of a sloped roof on a house or outbuilding is permitted development as long as it:

- Doesn't protrude > 200mm beyond the roof slope or wall surface
- Is kept below highest part of the roof (exc. chimneys)
- Is sited to minimise external impact on building and amenity of the local area
- Can be removed when no longer needed

In conservation area or world heritage site panels must be kept off walls forming the principal or side elevation of house or outbuilding and not visible from a highway.

A single ground-mounted PV within a residential boundary is permitted development as long as it:

- Is below 4m above ground level and at least 5m from the boundary wall
- Is less than 9m2 area and less than 3m in any direction
- Is sited to minimise impact on amenity of local area
- Can be removed when no longer needed

Planning permission is needed for all listed buildings and grounds, flat roofs and commercial sites. This will take into account mainly the visual impact on the building and surrounding area.

Further Information

Planning for Renewable Energy: A Companion Guide to PPS22 - http://www.communities.gov.uk/publications/planningandbuilding/planningrenewable

Energy Saving Trust - www.energysavingtrust.org.uk/Generate-your-own-energy

Feed In Tariffs - www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/feedin_tariff/feedin_tariff.aspx

Microgeneration Certification Scheme - www.microgenerationcertification.org

Ofgem Renewable & CHP register - https://www.renewablesandchp.ofgem.gov.uk/

This reference guide forms part of the CLASP technical support and training programme for North West local planning authorities, delivered by Envirolink, Quantum Strategy & Technology and AECOM (2011).