

## Information Paper

# Installation of photovoltaic panels on existing flat roofs – some lessons learned

Roger Sadgrove and Steve Pester

**The BRE National Solar Centre provides advice on the procurement of photovoltaic (PV) systems for many types of building, including commercial and public sector buildings and blocks of flats with flat roofs.**

**In this Information Paper BRE uses first-hand experience of a 29 kW installation on one of its own flat-roofed buildings<sup>[1]</sup> to report on the insights gained from the project planning stage through to commissioning, operation and maintenance.**

**The Information Paper is aimed at clients and consultants considering the installation of PV systems on existing roofs. Although, in this example, the roof is made of pre-1970s asphalt the information can be applied to other types and ages of flat roofs on non-domestic buildings.**



A photovoltaic system on a flat roof

## Installing PV systems on existing roofs

In the UK, most of the PV installations on existing buildings are installed on roofs and the number of large, flat roof installations is set to expand rapidly following recent Government policy changes.

Although roof mounting of PV systems can create access and load-bearing issues, as described below, a roof-mounted system is likely to be more secure from vandalism and less likely to be overshadowed than one sited at ground level. Planning permission to install non-domestic PV systems is normally required, although an extension of permitted development is currently under consultation.

Apart from establishing whether equipment and materials can be delivered safely to the roof area in question, there are two distinct aspects to be considered at all stages: electrical safety and performance, and security of the mechanical support system.

## Electrical safety and performance

Electrical safety and optimum electrical performance depend on many things, but the primary factors are:

- the quality of system design and specification of the equipment
- the quality of installation
- annual irradiance at the location
- orientation and tilt of the PV array.

## Security of mechanical support

When designing the means of support, the following factors must be considered:

- the strength and durability of the mechanical system components