solarcentury

CIS 'Solar Tower'

Background

In June 2005, CIS became the first insurance company in the world to launch a customer-led ethical policy to guide the ethical performance of its investments. In line with their aim to reconstitute the relationship between its business activities and nature, CIS asked Solarcentury to develop a solution for ventilated PV rain cladding for their HQ in Manchester. Arup then employed Solarcentury to act as PV consultants, providing specialised PV knowledge and design. The project creates the largest commercial solar facade

in Europe, and will also be one of the largest solar power systems in the UK. The service core was traditionally covered in no less than 14 million one centimetre square, grey tesserae. The mosaic began to fail a mere six months after the building was completed. It has become a significant health and safety issue, and hence the need for it to be addressed. This project demonstrates how solar power can be easily incorporated into any building refurbishment to provide an extremely cost effective alternative to conventional building materials.

Solar design

Solarcentury provided specialised PV knowledge to design a weatherproof cladding solution by integrating photovoltaics (PV) around the tower's structure, offsetting building material cost of replacing the traditional mosaic tiles. In total, 7,244 Sharp 80W modules are used to clad the entire service tower. From this total, 4,898 PV modules are live, 870 ‘full size’ dummy modules and 109 ‘medium size’ dummy modules and 1,367 edge modules were used in order to optimise the system’s electical generation and minimise costs.

Solarcentury worked with Plusswall to engineer a framing solution for solar modules and the main contractors, ISG to effectively install the solar cladding solution around the tower.

Funding

The ambitious £5.5m solar project, the largest ever in the UK, is being supported by a £885,000 grant from the Northwest Regional Development Agency (NWDA) and a £175,000 grant from the Department of Trade & Industry (DTI).

Each megawatt hour (MWh) of electricity generated will also be eligible for benefits under the governments Renewable Energy Obligation Certification Scheme. Under this scheme, each MWh of renewable electricity generated is eligible for a tradeable certificate. The Government underwrites a minimum value for certificates of £30. Certificate values have risen steadily, and a forecast for certificate values is estimated at between £50 to £85. As such, using an assumed value of £50, the value of certificates is approximately £9,271 per year.

Summary of electricity comparisons

- Generates total electricity for 61 average three-bed houses each year
- Generates enough electricity each year to light an average three-bed house for over 305 years
- Generates enough electricity to make 6.8 million pieces of toast/9.9 million cups of tea every year

Summary of Carbon Dioxide (CO2) comparisons

- Annually saves over 100 tonnes of CO2 emissions, a major greenhouse gas, equivalent over 7 million party balloons or 63 Olympic swimming pools.
- Annual CO2 savings: account for 141 trees required to absorb CO2 over 100 years.
- To achieve the Kyoto Protocol, the UK is required to reduce CO2 emissions by 12.5% below 1990 levels by 2010. This installation offsets the contribution of 303 UK individuals to this target every year.

Technology	Solar PV
Installation Type	Wall cladding
System size (kWp)	391
Forecast electricity generation / year (kWh)	183000
Panel area (m2)	3972
Building integrated	Yes
CO2 saving / year (kg)	103944
Date of last energy reading	2001.01.01
Type of project	Commercial