

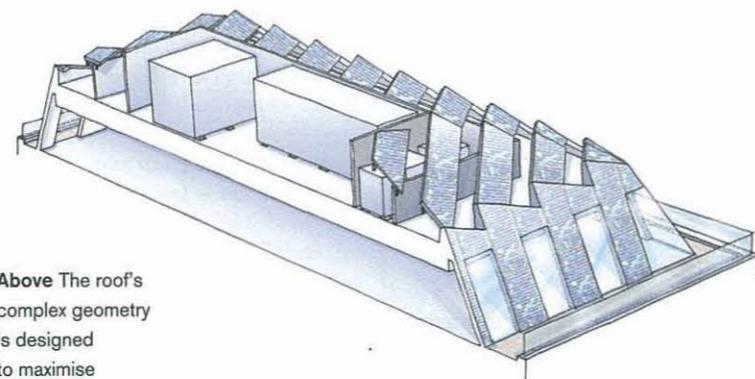
# Sun and substance

A remarkable mansard roof comprising 130 solar PV panels caps Squire and Partners' prestigious mixed-use development at 5 Hanover Square, writes *Michelle Price*

Shortlisted for this year's AJ100 Practice of the Year Award, Squire and Partners is currently working on a range of high-profile central London projects. They include the Bulgari Hotel, which will open this summer, the Shell Centre redevelopment masterplan and this, the recently completed 5 Hanover Square.

Sited on the square's south-east corner, 5 Hanover Square replaces a 1960s building with a six-storey block, topped with an elegant, PV-clad mansard roof. The facade features punched openings with deep window reveals to replicate the proportions and scale of the Georgian buildings fronting the square. The 8,400 square-metre scheme includes an art gallery on the ground floor, offices on first to sixth storeys and residential apartments in an adjoining block on Hanover Street.

Though renewable energies were not required by the planning department, the brief from the client, Mitsui Fudosan with Stanhope, called for an 'exemplar sustainable city centre building' to make use of renewable energy. An energy statement, submitted as part of the



Above The roof's complex geometry is designed to maximise solar collection

planning submission, proposed a well-insulated envelope and energy-efficient building systems combined with a 54kWp PV installation on the roof to achieve an 18 per cent reduction in CO<sub>2</sub> emissions over Part L2A 2006. AECOM services engineer Sophia Negus explained that early feasibility studies, including wind simulations, showed that the site was not suitable for wind energy. Ground source heat pumps were considered, but dismissed owing to the proximity to Crossrail tunnels and the limited footprint of the site. Photovoltaic panels were chosen as an appropriate

renewable technology for the location and massing of the scheme.

The EPC B-rated office and CSH Level 4 development exude quality throughout, but the real gem is the top floor. A mansard roof was designed specifically for the PV installation. To achieve the complex geometry required for optimum orientation of the 130-panel installation to maximise collection of solar rays, the architects opted for a saw-toothed roofline.

Visible from the square, the PV box sits cleanly above the building and avoids the usual PV aesthetic of 'slapped-on' panels, as well as the



'developers' mansard stereotype.

PV panels by Sunpower were chosen for their 'sleek, uniform, matt black surface,' says project architect Nick Munro. The south and west mansard facades are clad in PVs, while the north and east elevations, which receive less sunlight, are clad in identical panels without PV capacity.

The feed-in tariff was not in place when the decision to go with PVs was made. In fact, the project squeaked through just in time to take advantage of the scheme, so this was a bonus for the client. Each residence is allocated eight of the 'best performing' PVs, leaving the office with a total of about 90 panels. The engineer estimates the payback period (including the feed-in tariff) to be between 10 and 15 years.

The predicted contribution towards electricity use generated by the PVs is only 3.4 per cent. This low yield for an entire floor and roof clad in PVs demonstrates the challenge of photovoltaics as a viable option in urban locations. The amount of south-facing surface area is just too limited. On a plus note, the architects say that the current PVs could be easily upgraded when more powerful and efficient panels hit the market. ■

## PROJECT DATA



CLIENT  
Mitsui Fudosan with Stanhope  
DATE OF COMPLETION  
April 2012  
STRUCTURAL ENGINEER  
Ramboll UK  
SERVICES ENGINEER  
AECOM  
ESTIMATED ANNUAL CO<sub>2</sub> EMISSIONS  
24.3kg/m<sup>2</sup>