

Integrated Solar Photovoltaic Roof for Area of Outstanding Natural Beauty



Solar powered roof

This beautiful architect designed eco-house is on an elevated and exposed coastal location above St. Ives, Cornwall. The site is within an Area of Outstanding Natural Beauty so it was important for the architect to select a practical, weatherproof and aesthetic solution, as well as being visually acceptable by the local planning authorities.

The GB-Sol RIS system was chosen by Toucan Developments as it met all the design criteria. The company's ability to produce individual solar panels in the necessary triangular and trapezoidal shapes required by the design was a paramount factor. The solar panels were produced incorporating non-reflective glass to combat glare.

GB-Sol also designed and produced all the bespoke flashings to complete the interface with the natural slates fitted on the northern roofs. The entire RIS system was CAD designed from the drawings supplied by the architect, and 'as-built' roof dimensions were double checked on site prior to final manufacture.

As each PV roof elevation faces a different direction, three single phase inverters were used, and they were connected to the 3 supply phases to provide a balanced electrical supply for the building services. Eighty eight of the panels generate power with just four small non-generating triangles completing the roof structure.



GB-Sol equipment used

GB-Sol panels – Manufactured in the UK all GB-Sol panels provide the lowest carbon footprint, and are designed with hidden bus-bars to provide an appearance that compliments the natural slate on the northern roofs.

Mounting system – The RIS system has been tested by BRE under simulated hurricane conditions and has verified these excellent results in use even in coastal conditions since 1995. GB-Sol roof integrated 'RIS' mounting rails and cap strips are extruded in South Wales using Welsh recycled aluminum. Engineered to be robust, long lasting, and fitted to the roof structure, the system is assembled on site from pre-configured components so no further cutting or drilling is required. The flashings are drilled on site to accommodate building tolerances. The RIS's lightweight construction means that it imposes a lower load on the battens/roof paneling than the tiles or slates that it replaces.

System Design – The RIS system is manufactured from semi-structural aluminum rails enclosing PV solar laminates (frameless panels). The laminates are fitted with an EPDM gasket to provide a weatherproof seal. The system is also provided with edge flashings designed for the specific application, and incorporates the triple glazed roof-lights so completing the weatherproofing of the roof. This scheme was CAD designed in-house by GB-Sol to create the exact dimensions and angles required.

Case Study Toucan Developments Cornwall - May 2013 RIS

GB-Sol – low cost PV panels, bespoke PV panels, mounting systems and PV accessories