

powerpanel

Integrated Solar PV Solutions



Insulate &
Generate

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Integrated Solar PV Solutions

PowerPanel is a fully integrated solar PV system. From initial enquiry with our specialist in-house design team, through to installation and grid connection, Kingspan is your complete solar integrator.

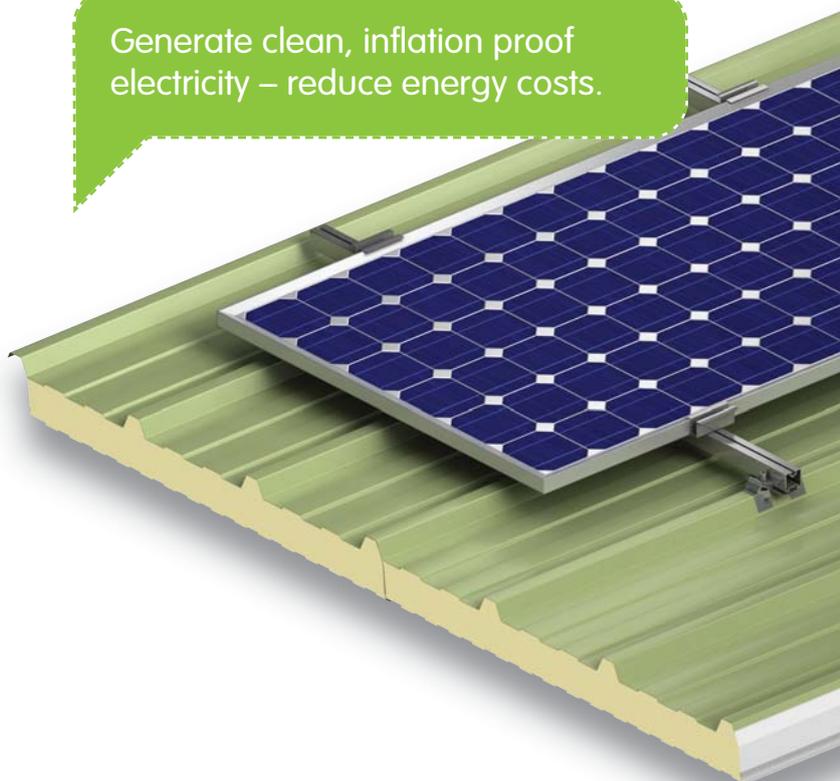
Photovoltaic (PV) Modules

- Generate clean, inflation proof electricity – reduce energy costs.
- Increase asset / rentable value of the building.
- Meets Corporate Social Responsibility (CSR) needs.
- PV generated electricity mitigates the carbon contribution.
- Not dependent on fossil, wind or nuclear fuels.
- Installed PV Systems produce zero CO₂ emissions.
- Even if the sky is overcast, PV is still proven to produce electricity.

Features

- Single-source integrated roof, wall, façade and solar PV provider.
- Project analysis / viability, design, supply, installation, testing, commissioning and handover service.
- PV modules are MCS certified and installed by MCS approved contractors.
- Integrated, value-engineered systems for quick and easy installation.
- Integrates with all Kingspan roof and wall products for design flexibility.
- Mono and polycrystalline PV technologies have a proven operational life of 50 years.
- The only cost-effective, widely accepted renewable technology that guarantees on-site electricity in an urban environment.

Generate clean, inflation proof electricity – reduce energy costs.



Kingspan Total Guarantee

Kingspan PowerPanel Total Panel Guarantee warrants the thermal and structural performance of the insulated panels, the mountings and fixings of the solar panels and the power output for a period of 25 years.



Put your roof to work!

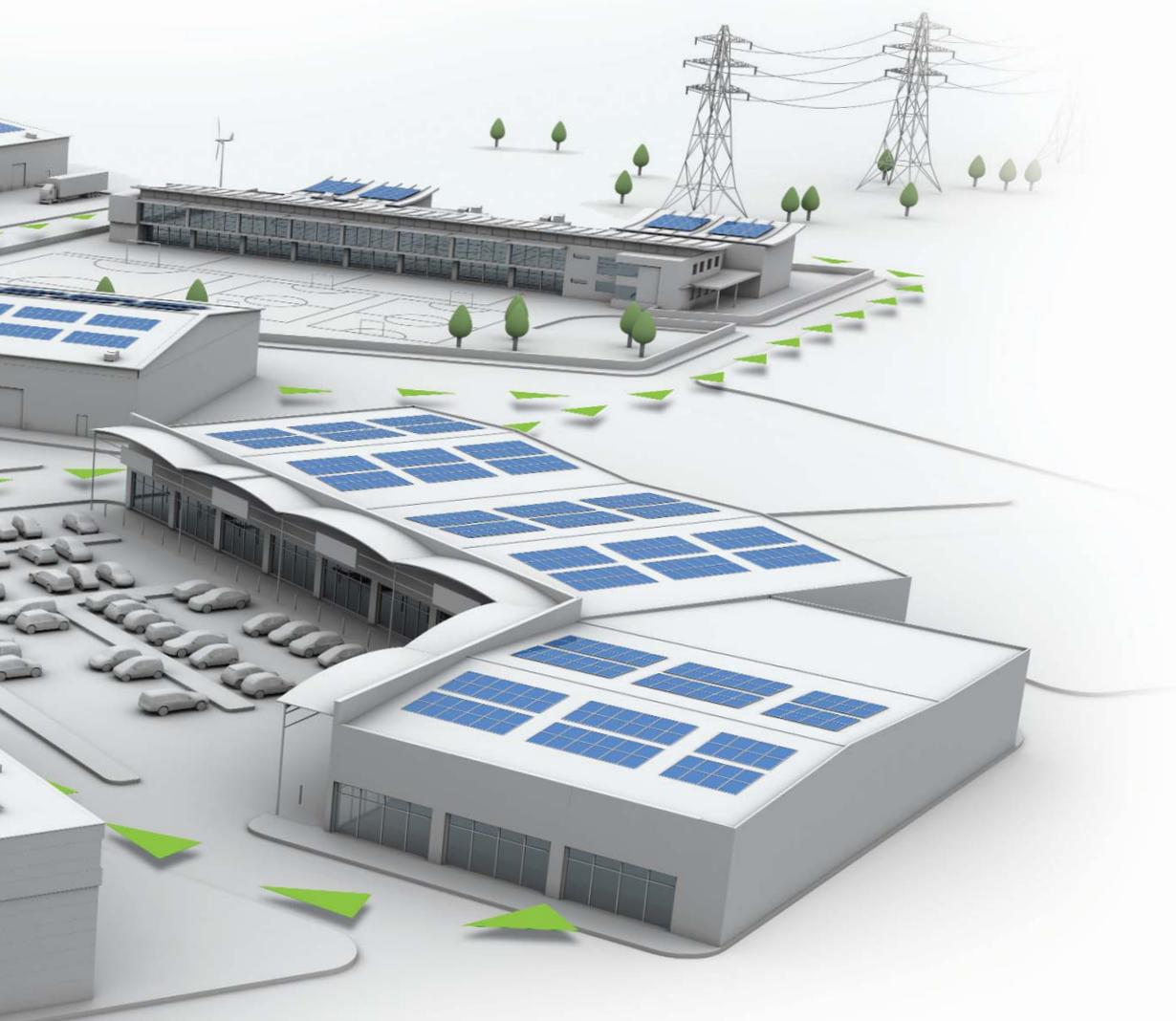
Generate your own power and benefit from the Feed-in Tariff

Introduced by the Government in April 2010, the **Feed-in Tariff (FIT)** benefits individuals and organisations that generate electricity from renewable sources, including solar PV.



- 25 year Feed-in Tariff, index linked income stream
- Free energy for life
- Can enhance property value
- Reduces impact of rising energy costs
- Reduces carbon footprint

The Feed-in Tariff is a Government initiative designed to encourage the installation of renewable energy systems



How the Feed-in Tariff works

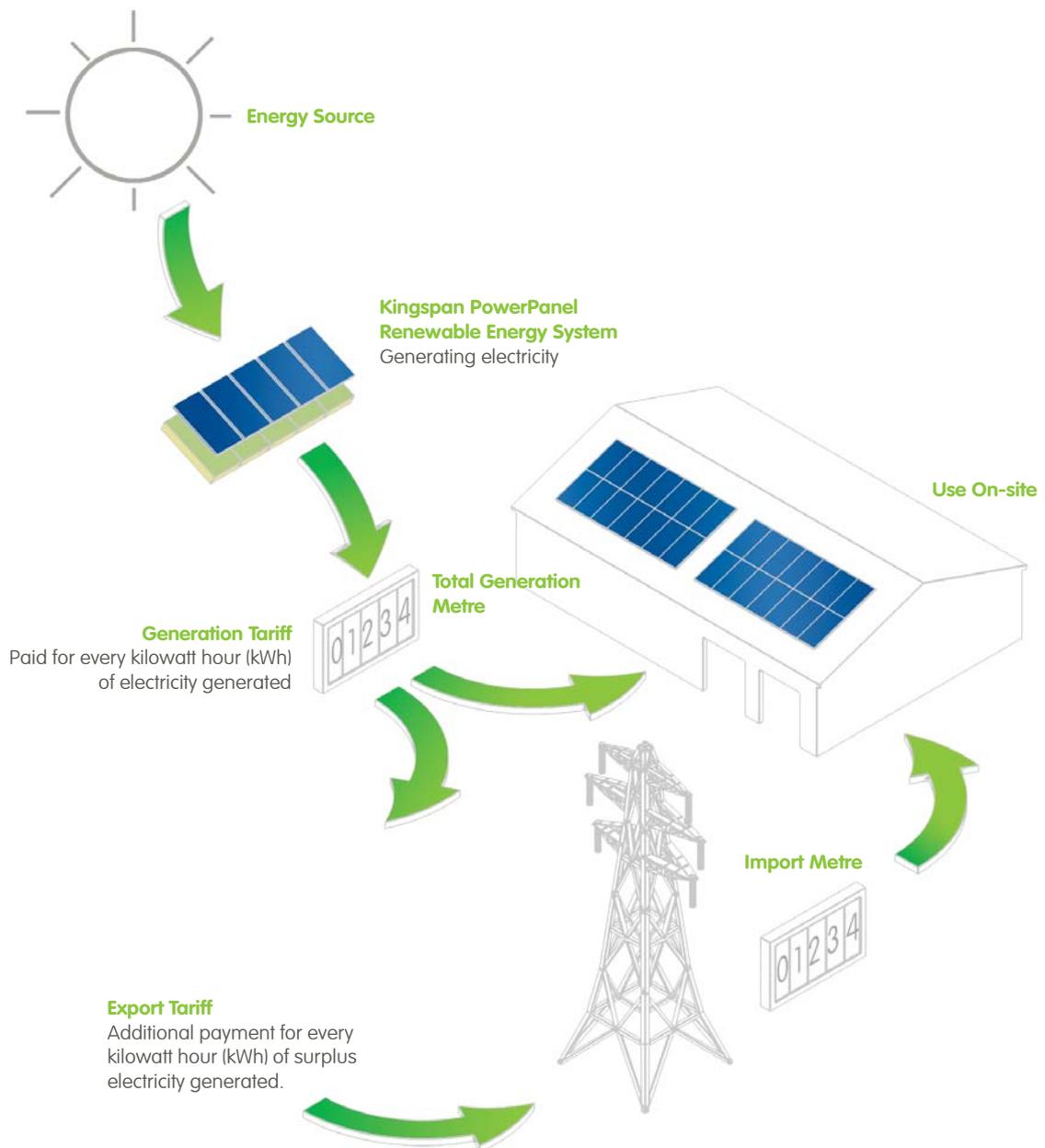
Owners of solar PV systems that generate electricity will be paid for every kilowatt hour (kWh) of electricity generated, even if it is used on-site.

This Feed-in Tariff is a fixed rate and is set by Government legislation. The rate paid is determined by the type and size of the renewable energy system installed.

In addition, any surplus electricity generated will be fed into the National Grid and will trigger additional payments. This Export Tariff is the same for all types and sizes of renewable energy systems.

Feed-in Tariff payments will be made for at least the next 20 years for electricity generated from a renewable source (25 years for solar photovoltaic (PV) panels).

Any payments are in addition to the savings that could be made by not having to purchase all the electricity usually required from a supplier.



How the benefits add up

The amount of income generated from the Feed-in Tariff will vary depending on the type and size of renewable energy system installed.

The table, right, illustrates the current rates set by the Government when a solar PV system is installed.

An additional payment of 3p per kWh will also be paid for any surplus electricity fed into the National Grid¹.

¹ Source: www.decc.gov.uk

² Data correct at 17.02.11 and subject to change under DECC Feed-in Tariff review.

Size of System	Generation Tariff Per kWh Generated ²
< = 4kW (new build)	36.1p
< = 4kW (retrofit)	41.3p
> 4 - 10kW	36.1p
> 10 - 100kW	31.4p
> 100kW - 5 MW	29.3p
Stand alone system	29.3p

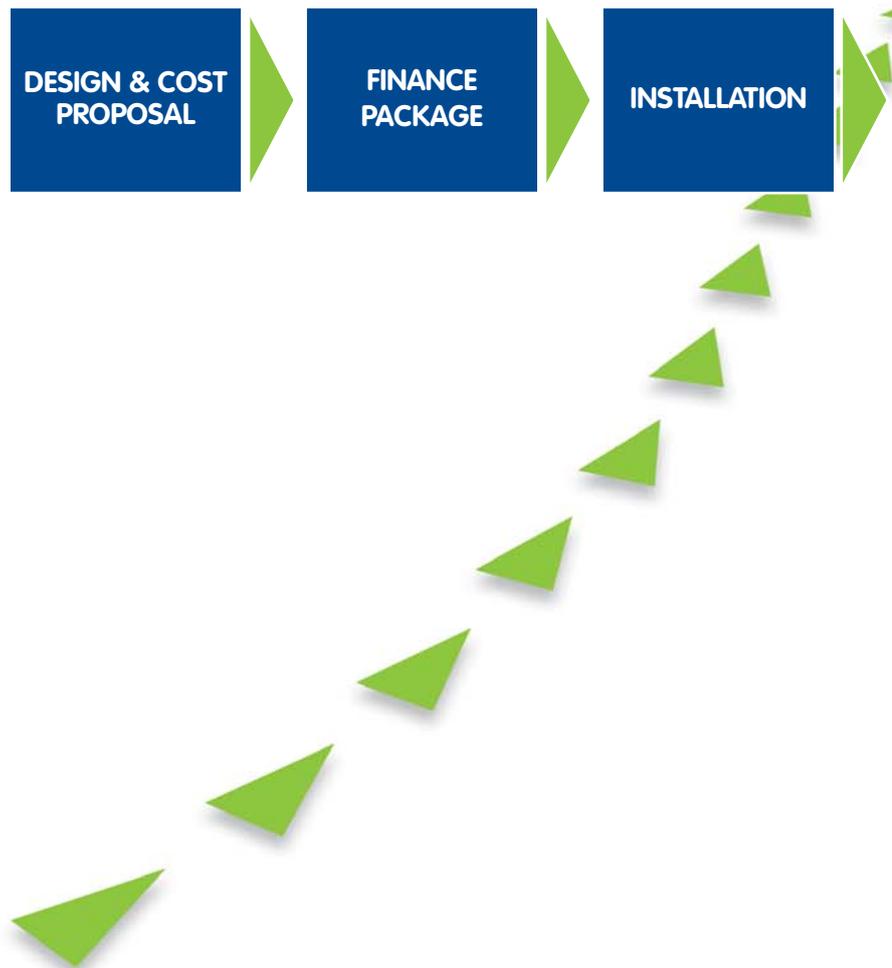


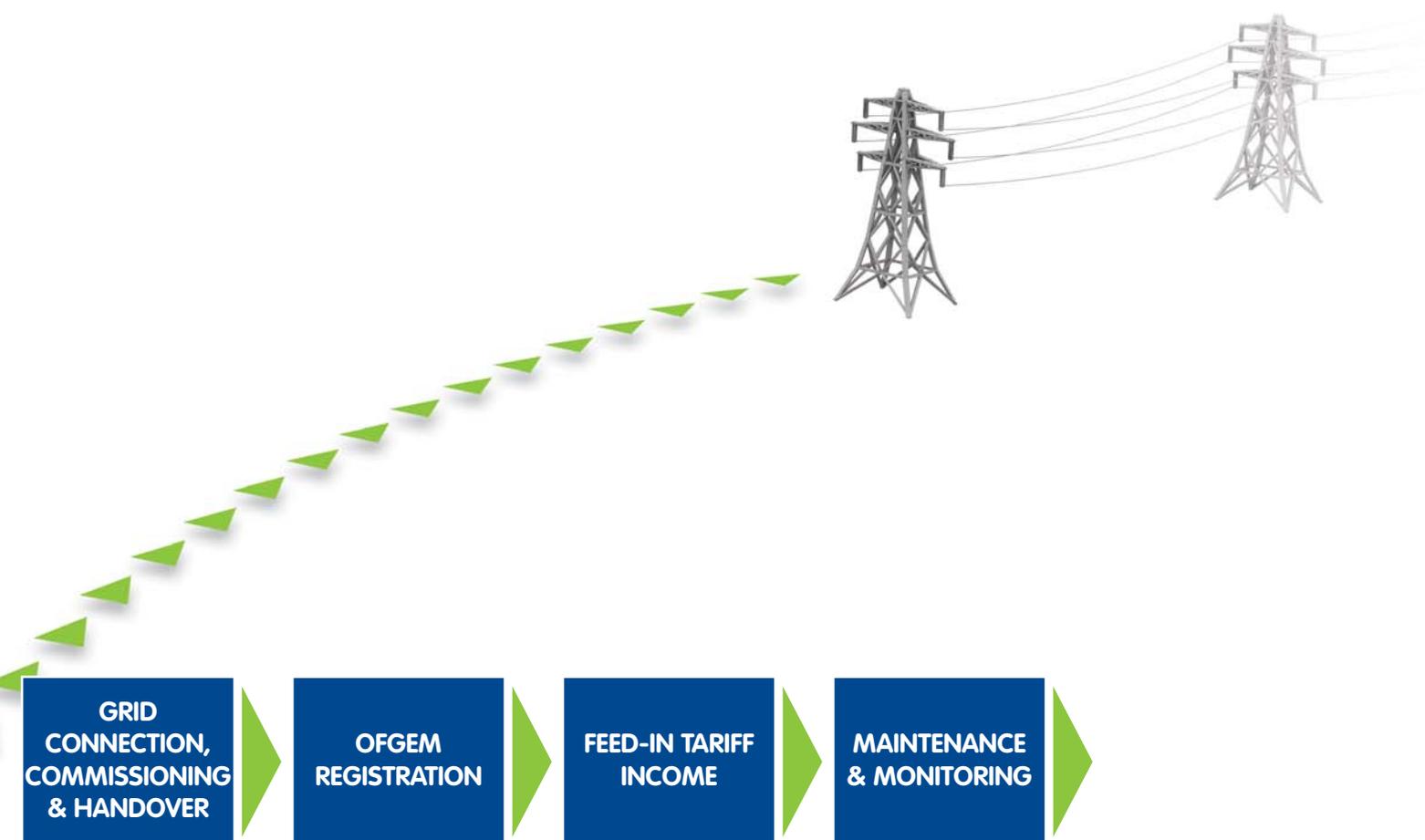
Renewable energy systems are suitable for a wide range of properties, businesses and organisations.

A powerpanel installation will give you...

- Risk-free, index linked Feed-in Tariff revenue generation from unutilised roof space
- Enhanced asset value and increased rental potential
- Integrated roof or wall solutions
- Reduced carbon footprint
- Significant green PR and marketing opportunities to drive the green agenda

powerpanel roadmap





As each site has individual requirements, Kingspan will develop a bespoke package, taking into account:



Frequently asked Questions

How is my existing roof guarantee affected?

Kingspan will honour the guarantee on previously installed Kingspan roofs.

Is my building suitable for a PV installation?

Kingspan will conduct a comprehensive assessment in order to identify the potential of your building for a PV installation. As the client, you will be fully informed of progress and should your site prove unsuitable for any reason Kingspan will terminate the assessment. No costs will be incurred on your part.

Will the installation of a PV system affect my buildings insurance?

Generally, existing mainstream insurance policies are more than adequate for PV installations. A PV installation is unlikely to compromise your existing policy and no further premium costs should be incurred.

Can I sell my building after a PV system has been installed?

Yes. In fact, our experience suggests that potential buyers recognise the advantages of a PV installation and that the presence of a PV plant offers significant buying incentives.

Step 1 → Insulate

envelopefirst
High Performance Insulated Panels

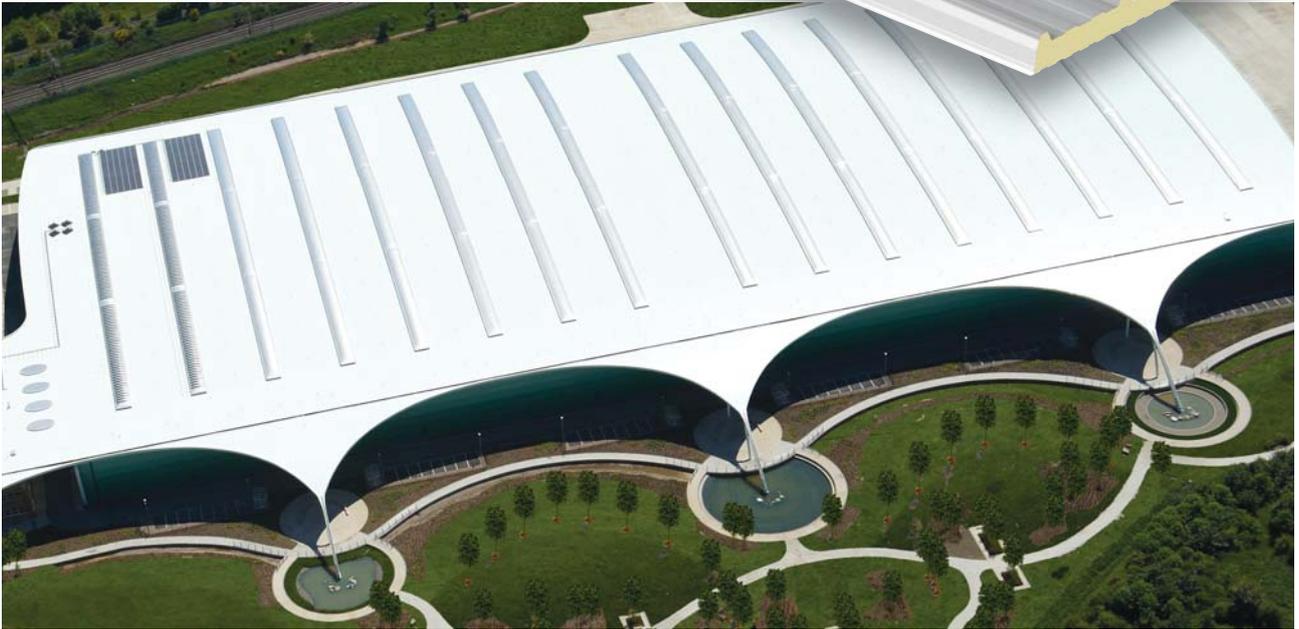


Image courtesy of Gazeley and Central Photography

The first step is to reduce energy demand and one of the simplest ways to do this, for both new build and refurbishment projects, is to use insulated panel systems which offer guaranteed high thermal performance and low air leakage over the lifetime of the building.

Over the past 50 years, insulated panels have evolved as a particularly thermally efficient and economic method of construction and have been extensively used in refurbishment as they are ideal for re-cladding walls and roofs. Insulated panels offer the best long term guaranteed thermal performance and can improve the energy efficiency of a building up to 44% producing an immediate payback on investment.

As single component, single-fix systems they provide quick and easy installation, saving up to 50% on construction time.

They are so effective because high performance insulation is an integral part of the panel system, so excellent U-values are guaranteed. For example, many older buildings have U-values of $0.6 \text{ W/m}^2\text{K}$ or worse, so over-cladding with an insulated panel system that provides a U-value of $0.18 \text{ W/m}^2\text{K}$, will offer a huge energy saving, as well as improving the aesthetics of the building and providing a more economic and environmentally sound solution than demolition.

Step 2 → Generate

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Integrated Solar PV Solutions



The development of sources of renewable energy is a crucial part of the strategy to improve energy efficiency and cut carbon emissions, but for these to work they must also be economically viable.

Initiatives such as the Feed-in Tariff present opportunities to move renewable energy out of the niche and into the built environment in readiness to meet targets for energy efficient buildings and carbon reduction.

One of the key aspects for the success of integrating sources of renewable energy will be the ease with which they can be incorporated into buildings. Kingspan Insulated Panels has a number of solutions which meet this criterion.



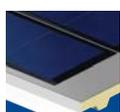
Roof powerpanel Module

Kingspan insulated roof panels with crystalline modules fixed directly to the crowns.



Solyndra® powerpanel Module

This roof mounted cylindrical module captures direct, diffuse and reflected sunlight across a 360° PV surface. It is used in conjunction with any Kingspan insulated roof panel system.



Roof powerpanel Laminate

A range of insulated roof panels with factory-applied thin film laminates adhered directly to the external facing.



Wall powerpanel Module

A crystalline module similar to the roof module, but applied vertically on insulated wall panels.

Step 3 ↓ Payback rate

Example 1: Education

Middle School, 350 pupils,
Newcastle Upon Tyne.

System purchased outright. Income received from the Feed-in Tariff for every kWh generated for 25 years, index linked.

Insulate & Generate
£24,901
each year



Approx roof area (m ²)	1,600
PV system size (kWp)	80
kWh/kWp/annum	790
PV system output (kWh/annum)	63,200
Feed-in Tariff (£)	0.314
PV area (m ²)	558
CO ₂ savings (kg/annum)	32,674
Estimated annual revenue (£)	
50% usage on-site, 50% exported to grid	23,321
100% usage on-site	24,901

Example 2: Office

3/4 Storey, 300 staff, London.

System purchased outright. Income received from the Feed-in Tariff for every kWh generated for 25 years, index linked.

Insulate & Generate
£17,097
each year



Approx roof area (m ²)	1021
PV system size (kWp)	51
kWh/kWp/annum	850
PV system output (kWh/annum)	43,393
Feed-in Tariff (£)	0.314
PV area (m ²)	356
CO ₂ savings (kg/annum)	22,434
Estimated annual revenue (£)	
50% usage on-site, 50% exported to grid	16,012
100% usage on-site	17,097

Example 3: Retail

Retail Unit, Liverpool.

System purchased outright. Income received from the Feed-in Tariff for every kWh generated for 25 years, index linked.

Insulate & Generate
£58,709
each year



Approx roof area (m ²)	3,930
PV system size (kWp)	197
kWh/kWp/annum	801
PV system output (kWh/annum)	157,397
Feed-in Tariff (£)	0.293
PV area (m ²)	1,371
CO ₂ savings (kg/annum)	81,374
Estimated annual revenue (£)	
50% usage on-site, 50% exported to grid	54,774
100% usage on-site	58,709

Example 4: Industrial

Engineering Unit, 30 staff, Birmingham.

System purchased outright. Income received from the Feed-in Tariff for every kWh generated for 25 years, index linked.

Insulate & Generate
£15,940
each year



Approx roof area (m ²)	994
PV system size (kWp)	50
kWh/kWp/annum	814
PV system output (kWh/annum)	40,456
Feed-in Tariff (£)	0.314
PV area (m ²)	347
CO ₂ savings (kg/annum)	20,916
Estimated annual revenue (£)	
50% usage on-site, 50% exported to grid	14,928
100% usage on-site	15,940

How PV works

A Photovoltaic Cell (PV) is a semi-conductor device which converts solar energy into electricity.

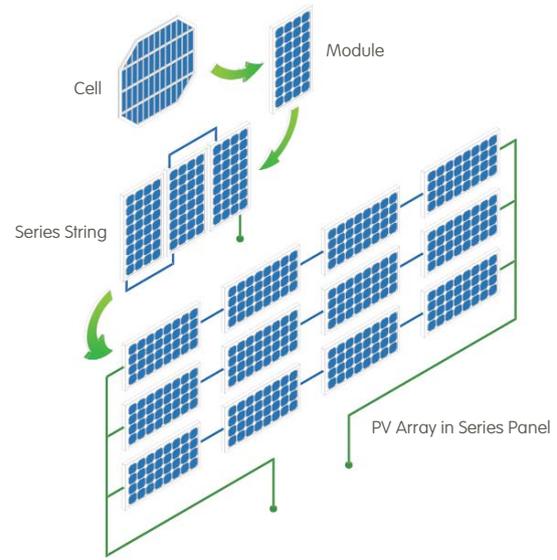
There are two main types of PV Cell Technology:

- **Crystalline PV** – Monocrystalline or Polycrystalline.
- **Thin film PV** – amorphous Silicon, CIGS, CDTE, Dye Sensitised or Organic.

Modules, Strings & Arrays

- Multiple PV Cells are interconnected and encapsulated to produce a PV Module.
- Modules are connected in series to form a string, (Series connections increase system voltage).
- A PV array is made up of modules connected in series and parallel, (parallel connections increase the current in the system).

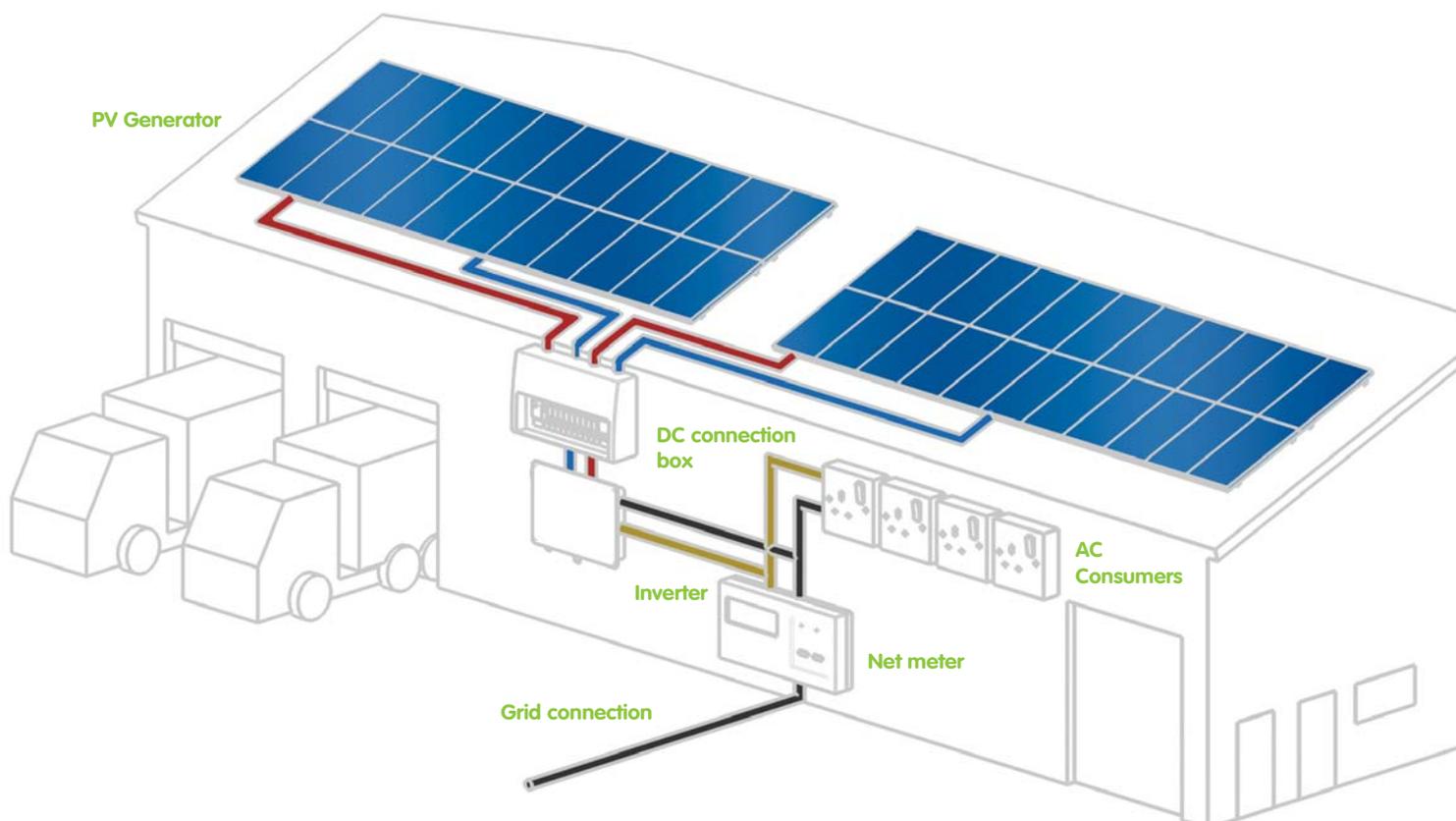
Modules, Strings & Arrays



Inverters

An inverter is used to convert the generated DC electricity from the PV array to AC for use on site or for exporting to the grid.

- Stand alone inverters are used for off grid systems.
- Grid tie inverters are used when the installation is connected to a utility supply. The grid tie inverter also synchronises the PV generator with the grid.



Orientation, Pitch and Shading

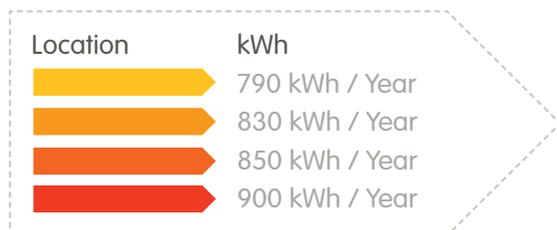
For optimal performance of the photovoltaic array, it should face between south-east and south-west at an elevation of about 30-40°. However, in the UK even flat roofs receive 90% of the energy of an optimum pitched system – see AC output table (right).

It is important to ensure that your PV system will not be shaded during the day. Avoid placing the array where there will be significant shading from surrounding buildings or trees, since this will decrease the output from the system.

Although generally installed on a roof, a PV system can be installed on any south facing elevation. It can also be used for solar shading or as a rainscreen on a building wall – this is particularly suitable for prestige buildings.

Solar Irradiance

Average annual solar radiation (kWh/m²/day) for Great Britain and Ireland.



AC outputs in kWh/KWp

Effect of Orientation and Pitch on Array Performance (% of Ideal).

	Vert	80	70	60	50	40	30	20	10	Horiz
East	58	65	70	76	80	84	86	88	90	90
SE	69	77	84	89	93	96	96	96	94	90
South	71	80	87	93	97	100	100	98	96	90
SW	67	75	82	87	92	95	96	96	94	90
West	56	63	69	74	78	82	86	87	89	90



Planning

The majority of buildings will not require planning permission for the installation of PV systems. If however the building is in a conservation area or is a listed building you may need to apply for full planning permission. Kingspan recommends checking with your local council to ascertain the planning requirement for your specific project / building.

Product range

Roof powerpanel Module

Kingspan Roof PowerPanel Module consists of specific Kingspan insulated roof panels with a frame mounted module. It is suitable for pitched roof applications on new build or refurbishment projects.

Features

- Complete roof and PV system with the Kingspan 25 year total system guarantee available.
- Structurally designed specifically to facilitate installation onto specific Kingspan insulated panels.
- Integrated bypass diodes to minimise shading effects.
- Available in approx 125 to 145Wp output per m² installed (depending on power rating of module).
- Quick and easy site connection using 'push together' connectors.

Kingspan Roof PowerPanel Modules can be mounted on:

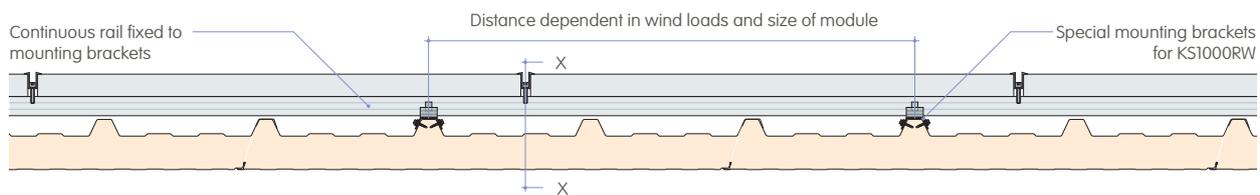
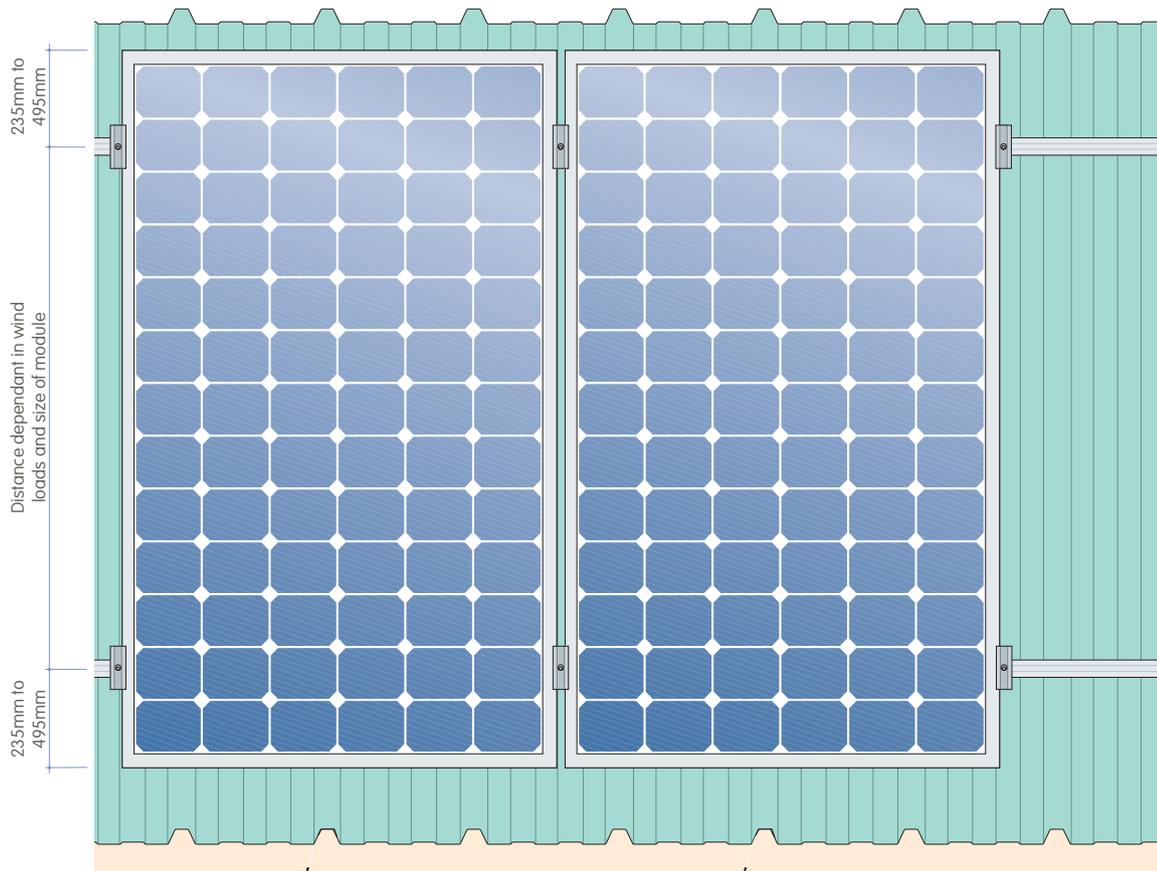
- KS1000 RW Trapezoidal
- Kingspan Lo-Pitch
- Kingspan Kingzip® – KS500 / KS1000
- Kingspan Topdek
- Kingspan Topspan



KS1000 RW Trapezoidal



PV mounted on KS1000 RW Trapezoidal



Product range

Roof powerpanel Laminate

The systems offer the possibility to install modules over large roof areas. They are lightweight and flexible, so they can be integrated into most roof structures, while maintaining the main goal...generate optimal energy output.

They offer long-term high performance, roof integration and environment friendliness at a competitive price.

Features

- Quick to connect, lightweight and flexible, so they can be integrated into most roof structures.
- Available in two lengths, 2849mm and 5486mm.
- Limited power output warranty: 92% at 10 years, 84% at 20 years, 80% at 25 years (of minimum power).
- Integrated bypass diodes to minimise shading effects.

Kingspan Roof PowerPanel Modules can be mounted on:

- Kingspan Lo-Pitch
- Kingspan Kingzip® – KS500 / KS1000
- Kingspan Topdek
- Kingspan Topspan

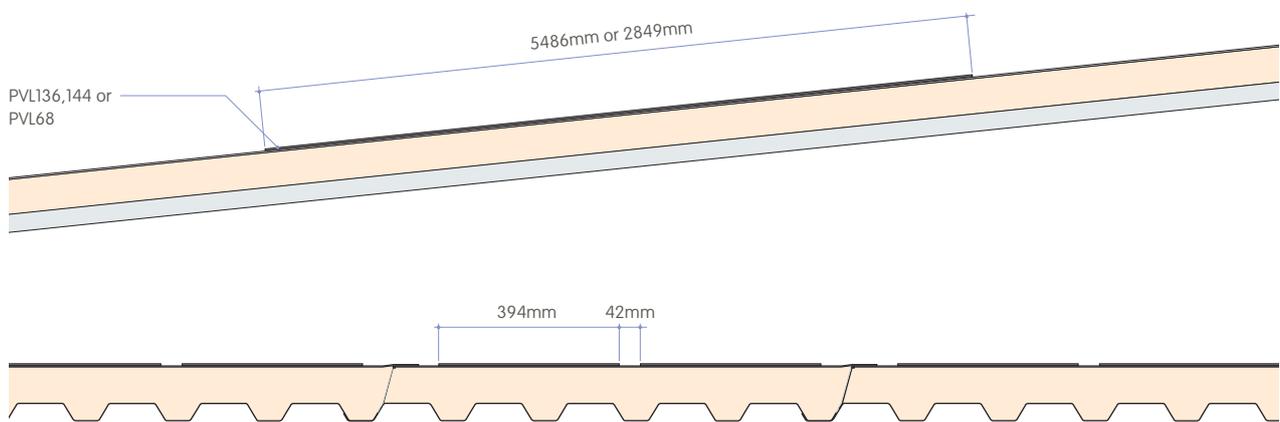
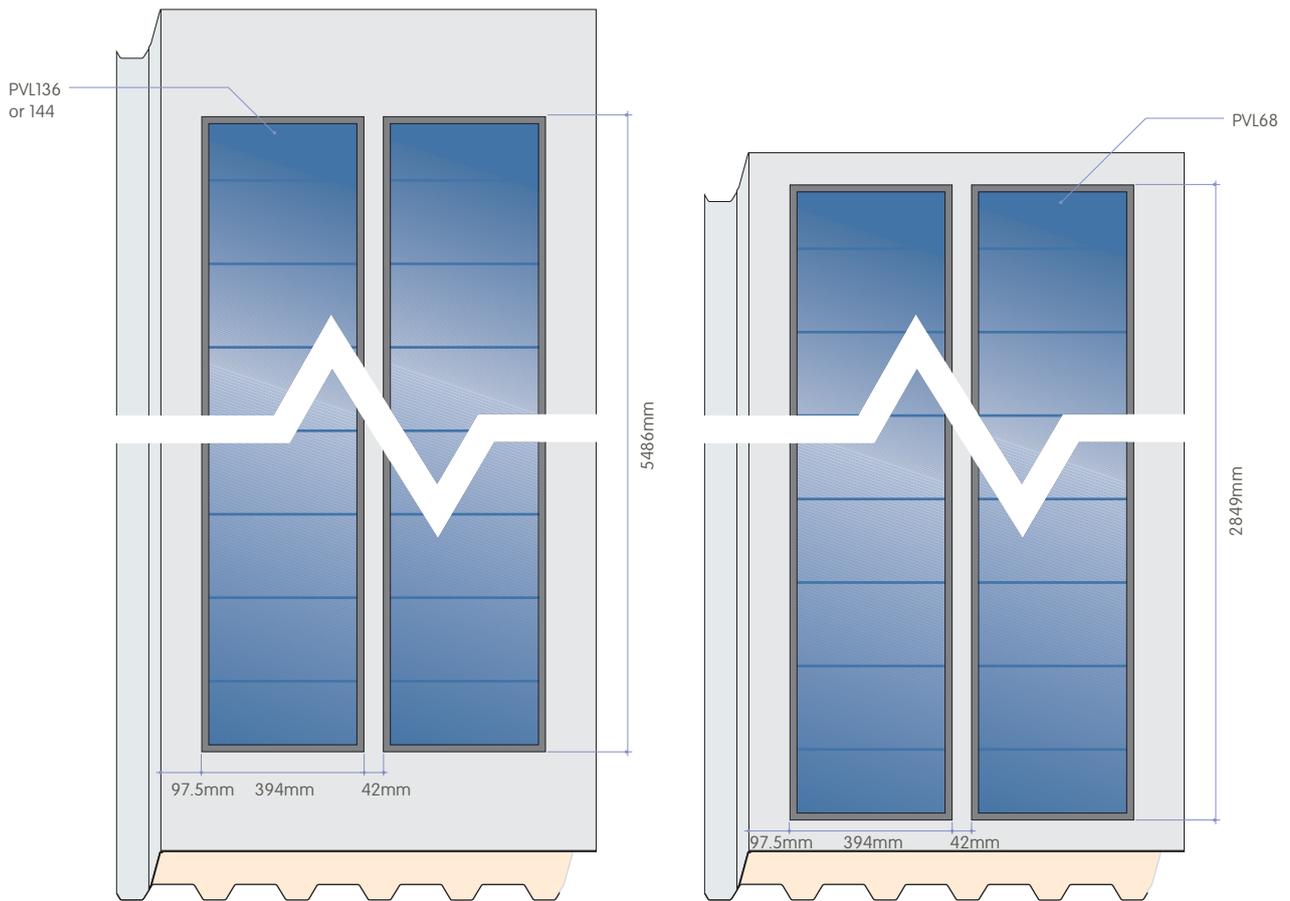


Kingspan Topdek

The Kingspan Roof Laminate systems are a range of insulated roof panels manufactured with a thin film solar laminate adhered directly to the surface of the panel to create a singular photovoltaic roof panel.



PV mounted on Kingspan Topdek



Product range

Solyndra® PowerPanel Module

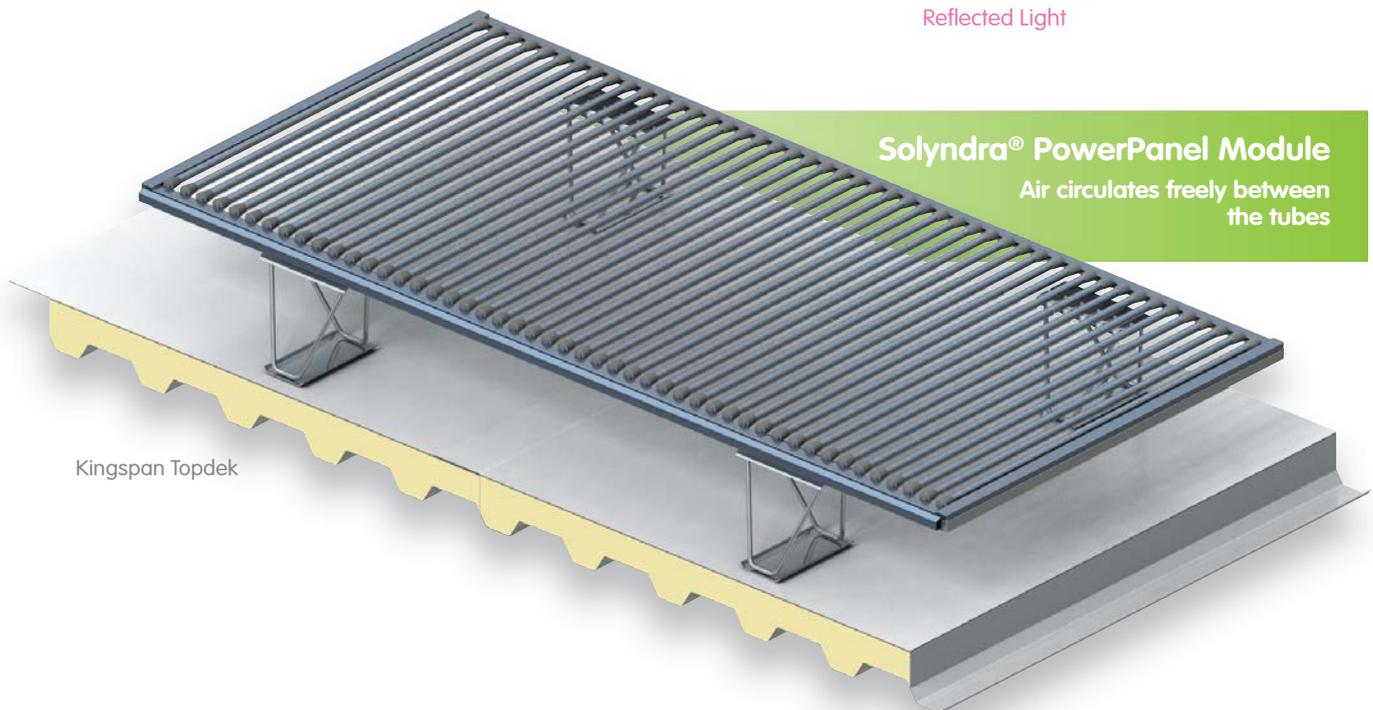
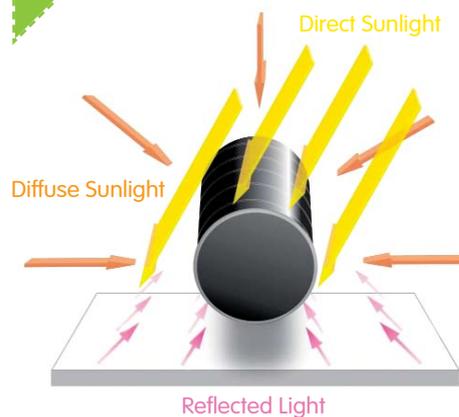
Solyndra® Solar is one of the worlds most advanced photovoltaic systems using CIGS (copper indium gallium selenide) technology. These cells are known for their high degree of conversion efficiency. The Solyndra® PowerPanel Module is set to revolutionise the way roof area is used to generate clean, green energy for your building.

These unique cells consist of tubes that catch solar radiation across their entire surface, exploiting the diurnal cycle of the sun, like a solar tracker without the expense. In addition radiation is reflected back onto the panel from the roof. For optimal energy output, Solyndra® PowerPanel Modules are used in conjunction with a white membrane to ensure maximum efficiency is achieved and to obtain maximum albedo.

Solyndra® PowerPanel Modules are self-weighting so installation is as simple as placing them on the roof and coupling them together.

With Solyndra® PowerPanel Modules, air can stream through between the tubes practically unhindered, minimising the wind forces effective on the module, making it unnecessary to anchor the modules with additional measures. Their positional stability is reliably ensured by their tare weight.

Solyndra® PowerPanel Modules have been subjected to thorough tests and are accredited for wind speeds of up to 130mph (209.21 kmh).



Kingspan Topdek

Product range and technical data

Solar module	Tested to	SL-001-150	SL-001-157	SL-001-165	SL-001-173	SL-001-182	SL-001-191
Output at STC ($P_{max,MPP}$)	DIN EN 61646 Test 10.2 at STC	150 Wp	157 Wp	165 Wp	173 Wp	182 Wp	191 Wp
Power tolerance		+4 %, -5 %	+/-4 %	+/-4 %	+/-4 %	+/-4 %	+/-4 %
No-load voltage - U_{oc}	DIN EN 61646	91.4 V	92.5 V	93.9 V	95.2 V	96.7 V	98.2 V
Short-circuit current - I_{sc}	Test 10.2 at STC	2.72 A	2.73 A	2.74 A	2.75 A	2.76 A	2.77 A
Voltage at MPP		65.7 V	67.5 V	69.6 V	71.7 V	73.9 V	76.1 V
Amperage at MPP		2.28 A	2.33 A	2.37 A	2.41 A	2.46 A	2.51 A
Temperature coefficient - ΔP	DIN EN 6146				-0.38 %/°C		
Temperature coefficient - ΔU_{oc}	Test 10.4				-0.29 %/°C		
Temperature coefficient - ΔI_{sc}					-0.02 %/°C		
Required roof area		13.2 m ² / kWp	12.6 m ² / kWp	12 m ² / kWp	11.5 m ² / kWp	10.9 m ² / kWp	10.4 m ² / kWp

Measured under standard test conditions (STC) with a radiant power of 1,000W/m², a sunlight spectrum of AM = 1.5 and a cell temperature of 25°C.

Maximum operating voltage	Uniform design for 1,000V (IEC)
Dimensions	Module frame: 1.82 m x 1.08 m x 0.05 m, height: 0.3 m (modules on the mounts)
Mounts	Base legs aluminium, powder-coated
Connections	4 Tyco Solarlok; 0.20 m cable
Current capacity	max. 23 A
Roof load	16 kg/m module and mounts
Module weight	31 kg without mount
Maximum snow load	285 kg/m
Ambient temperature	-40°C to +85°C
Nominal temperature for solar cells (NOCT)	41.7°C at 800 W/m ² , temperature = 20°C, wind = 1m/s

The data results from testing and are entirely up-to-date. Deviations within the tolerance limits are possible.

SOLYNDRA® Solar modules are delivered with all the mounts, base legs, connections and joining elements required for the installation of the solar cell frame. SOLYNDRA® Solar modules are CE-compliant and certified to IEC 61646 and IEC 61730. SOLYNDRA® Solar modules have a 5-year product warranty and a 25-year power output warranty. The manufacturer's guarantee conditions apply.

Product range

Wall powerpanel Module

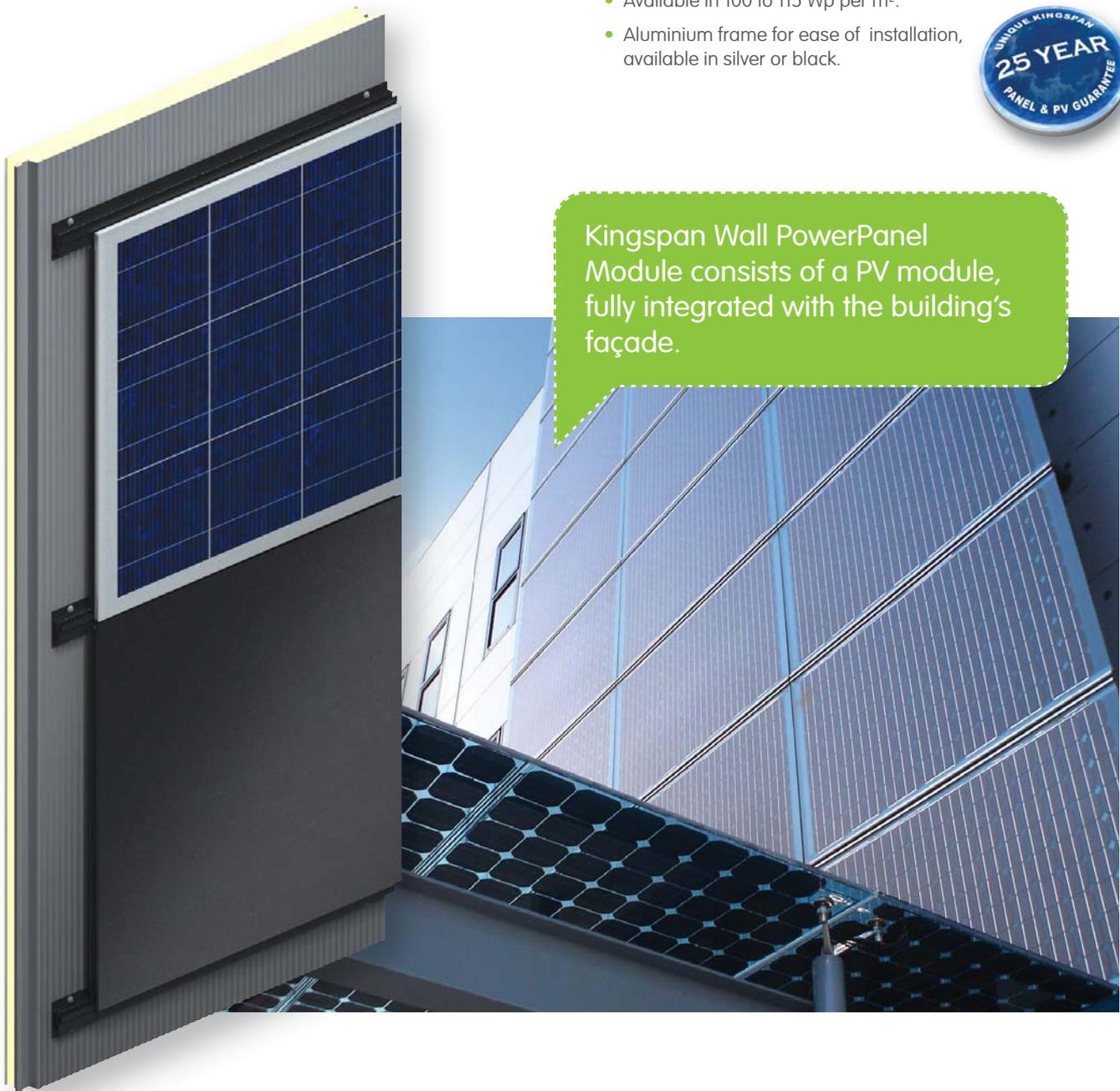
It is suitable for most wall applications on new build or refurbishment projects. Kingspan Wall PowerPanel Module has 21 enhanced efficiency crystalline silicon cells in series, with 75 to 80 Wp of nominal maximum power.

Features

- Fully integrates with Kingspan's insulated wall and façade systems.
- Integrated bypass diodes to minimise shading effects.
- Structurally bonded aluminium fixing rails for easy installation onto façade structures.
- Available in 100 to 115 Wp per m².
- Aluminium frame for ease of installation, available in silver or black.



Kingspan Wall PowerPanel Module consists of a PV module, fully integrated with the building's façade.



Renewable energy solutions



EnergiPanel Solar Air Heating System

Kingspan EnergiPanel is an innovative insulated solar air heating system designed for roof and wall applications as a supplement to the main heating system³. Profiled hollows beneath the crowns allow air movement up through the panel and the air is warmed by the simple process of using the outer steel skin as a solar energy absorber. The darker the external colour of the panel the greater the solar absorption.

The rate of airflow up through the panel is determined by the temperature of incoming air. Temperature sensors constantly monitor the external air temperature and varies the fan speed to ensure the supply air temperature is above the required internal temperature of the building. The regular circulation of warm fresh air drawn into the building improves the overall quality of indoor air, making the working environment healthier and more comfortable.

The system offers a low cost and reliable renewable energy source which can provide a rapid payback on investment and can help to deliver up to 3 credits in BREEM 2008 assessments. Kingspan's large scale test facilities have shown that heating costs can be reduced by as much as 20%, offering the potential to significantly reduce a building's carbon emission rate.

Kingspan EnergiPanel has the added flexibility of either being integrated with the existing HVAC services or installed as a standalone heating system, backed by the Kingspan Total Panel Guarantee.

Kingspan EnergiPanel is a single component system which allows fast track construction. No additional steel, solar absorber plate, supporting framework or additional fixings are required, thereby minimising the overall installation carbon footprint. Integrating seamlessly with other panel systems from the range, EnergiPanel features Kingspan's world renowned insulated panel technology combined with tested and proven solar air heating capability.

Free support from Kingspan envirocare® Technical Services can ensure the most efficient building design. To obtain computer modelled indicative data for your building please contact the Kingspan envirocare® Technical Services team on (UK) 0800 587 0090 or (Ireland) +353 (0) 42 9898529.

³ EnergiPanel Solar Air Heating System does not qualify for the Feed-in Tariff (FIT) or the Renewable Heat Incentive (RHI)

retrofit

Energy Saving Solutions

Today the number, and the age, of commercial and industrial buildings has a negative impact on rental values. In the present economic climate, refurbishment of existing buildings is a faster, more cost-effective solution than new-build in order to meet sustainable targets. Refurbishment increases asset and lettable values, making the building more attractive to buyers and tenants alike.

UK Government has set ambitious, legally binding targets (Climate Change Act 2008) to reduce greenhouse gas emissions by at least 80% by 2050, with an immediate target of 34% by 2020 (against a 1990 baseline).

Today's stock of **1.8 million non-domestic buildings** accounts for 18% of the UK's greenhouse gas emissions and the energy used in these buildings is approximately **300TWh per annum** - equivalent to the primary energy use of Switzerland³.

Therefore, significant energy efficiency improvements for existing buildings are required to meet these goals.

³ Source: Carbon Trust / IEA energy data, 2007.

Energy efficient retrofit starts with the **envelopefirst**

Kingspan have developed EnvelopeFirst™ – a design strategy for optimising a building's performance and the first step towards energy efficient retrofit buildings.

A building's envelope, services and renewables must be considered on a 'whole building design' basis in order to optimise energy performance to achieve Government targets.

The EnvelopeFirst™ approach to design focuses on maximising the thermal performance and airtightness of the building envelope, in conjunction with the application of energy efficiency measures and Kingspan PowerPanel Integrated Solar PV Systems.

Kingspan provides a range of high performance Retrofit solutions specifically designed to maximise the energy efficiency of existing buildings.



PowerPanel 'Strip & Re-Sheet'



PowerPanel 'Overclad'

Retrofit implementation programme

A successful retrofit involves a simple, structured programme to determine the most effective energy efficiency improvement measures, cost and savings for your building.

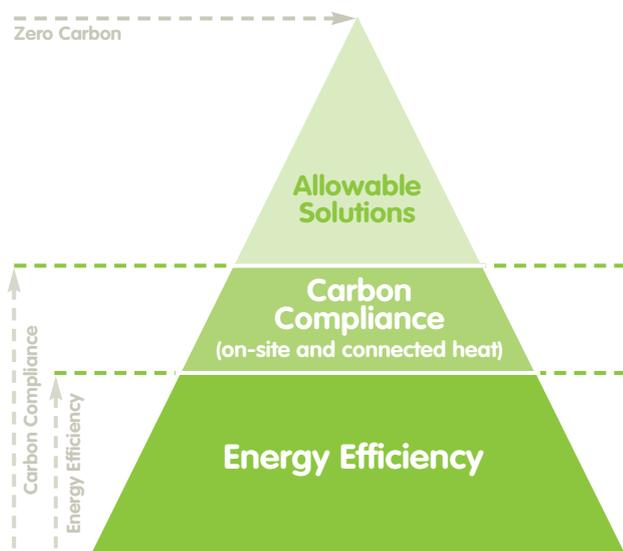
Kingspan Retrofit will complete a comprehensive energy assessment to establish the current condition and energy demands of your building.

The results produced will report on the building's current energy consumption and highlight any inefficiencies of the building fabric and services in order to detail specific retrofit measures to meet the required Government energy and CO₂ reduction targets.



The zero carbon agenda

The Government supports a hierarchical approach to meeting a zero carbon standard for buildings. The approach prioritises, in turn: energy efficiency measures; carbon compliance (on or near site); and allowable solutions. The diagram below aligns Kingspan's Retrofit improvements with the Government's zero carbon agenda.



National supply-side and market measures including:

- De-carbonisation of the national grid.
- Approved use of off-site renewable energy generation.
- Approved carbon offsetting / trading.

Deployment on-site of low and zero carbon technologies to generate and / or offset energy used within a building, including:

- Solar hot water
- Photovoltaics
- Micro & small scale wind turbines
- Heat-pumps
- Biomass heating systems
- Small scale hydro systems

- Improved fabric standards including insulation to walls, roof, windows and doors, plus improved building air permeability.
- Improved efficiency and controls of building services including heating, lighting, ventilation, hot water and air conditioning.
- Automated energy monitoring, controls and dashboard display to enable energy to be managed effectively and savings measured.
- Occupant engagement to reduce energy use by small appliances and unnecessary use of the building services.

For further information visit:

www.kingspanretrofit.com

Case study: Stennack House



Project:
Corporate Headquarters

Location:
Stennack House, St. Austell,
Cornwall, UK

Client:
Ocean Housing Group Ltd

Roof powerpanel Module

A project in St. Austell is demonstrating how the principle of 'insulate and generate' using a thermally efficient insulated panel system and state-of-the-art photovoltaics from Kingspan can achieve outstanding results, even in the gloomiest winter weather.

The initial phase of the project, which was completed in October 2010 involved replacing an old asbestos roof with over 1200m² Kingspan KS 1000 RW insulated panels – a first key step in achieving an energy efficient building envelope. Comparisons between high performance insulated panels with low air leakage and old single skin asbestos sheets show energy savings as high as 90%, so any investment in this kind of improvement will start to save money immediately and will continue to do so over the life of the building.

Having ensured that an airtight and well insulated roof would significantly reduce energy demand, the next step was to provide a source of energy generation with the addition of the latest PV technology. In this case the Kingspan Roof PowerPanel system was integrated with the energy efficient insulated panels, allowing the building owners to take full advantage of the government's Feed-in Tariff (FiT) scheme, and make the investment that achieves not only a significant building fabric improvement, but also carbon reduction, energy self-sufficiency and energy/income generation.

Two hundred and seventy-three Sharp 210W Polycrystalline PV Modules with a 57.33 kW peak capacity were installed to the south facing elevations of the roof, in what is believed to be the seventh largest array of photovoltaics in the country and the largest in the South West – 447.72m² in all.



Kingspan's technical and field services were involved throughout the project, from assessing the structural capability of the existing building, to identifying the optimum configuration for the PV modules and quality assuring the installation. Building modelling was used to simulate the likely output of the system and early comparisons of this data with the actual energy produced are already demonstrating the effectiveness of the system.

In December and January alone the system produced 3970.57 kWh of energy, and saved 2.1 tonnes of CO₂ – 38% more than predicted for those two months, despite the inclement weather.

The output will continue to be tracked, providing valuable information on the actual performance of the systems in place. It is estimated that the electricity produced will save over £20,000 annually, with a predicted lifespan in excess of 25 years.

Comparison of actual recorded kWh versus simulated kWh

Month	Projected output kWh	Actual output kWh	Difference output kWh	Difference output %
December 2010	1098.00	1944.83	846.83	43.5%
January 2011	1358.00	2025.74	667.74	33.0%

Case study: Brook House

Project:

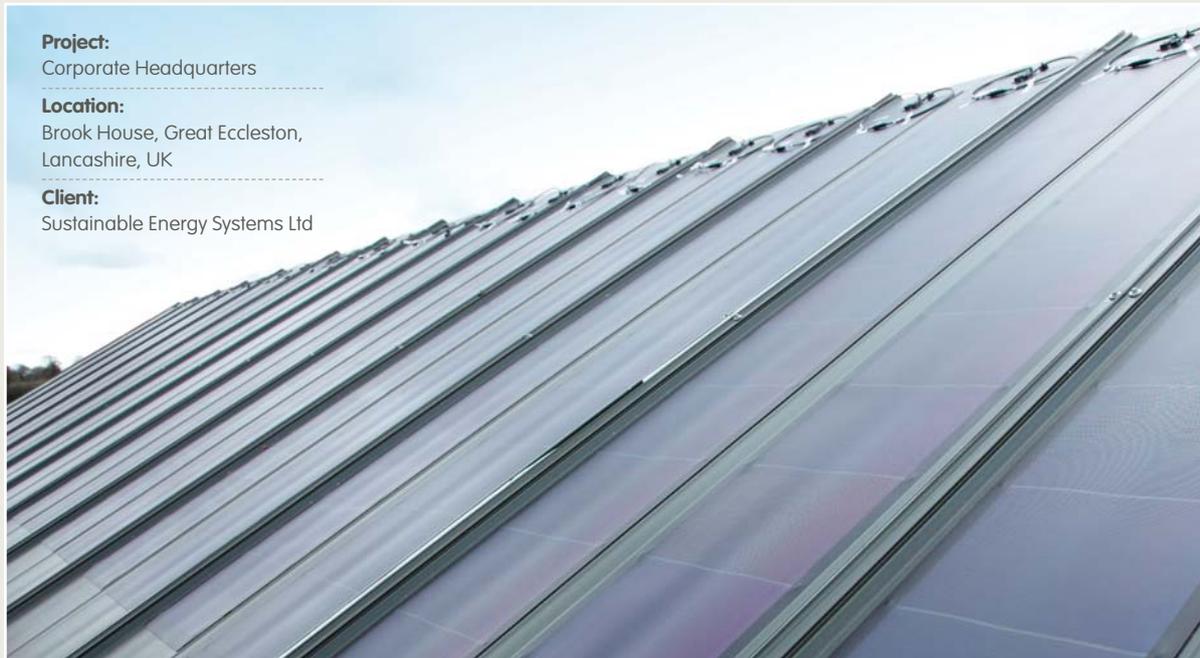
Corporate Headquarters

Location:

Brook House, Great Eccleston,
Lancashire, UK

Client:

Sustainable Energy Systems Ltd



Roof powerpanel Laminate

If you are in the business of advising people about the best ways to use renewable energy systems, it is important to practice what you preach, so when Sustainable Energy Systems Ltd (SES) came to refurbish one of their own buildings it made sense for them to take advantage of the new PowerPanel systems from Kingspan Insulated Panels.

The Kingspan PowerPanel range provides a number of solar photovoltaic options, but the system installed at the Brook House facility was the Kingspan PowerPanel Roof Laminate, which comprised a customised version of KS1000 LP Lo-Pitch insulated roof panels in Juniper Green with a thin film solar laminate adhered directly to the product's external facing. This system has the advantage of completely integrating a thermally efficient building element with an energy producing solar photovoltaic. The thin film laminate used for the system is flexible and lightweight and is installed in the factory so the panels arrive on site solar ready.

Jon Kemp, Managing Director of SES commented, "The Kingspan PowerPanel Roof Laminate system is a fast and effective way to integrate renewable energy generation into commercial buildings.

The system includes the superior properties of the Kingspan insulated panel whilst integrating an unobtrusive photovoltaic panel capable of producing approximately 80% of the Buildings energy requirements. It was a logical choice for us to use it on our own building".



The factory-built single fix nature of the PowerPanel Roof Laminate system allows for quick and efficient installation helping to keep the costs down, and in this instance helping to achieve a tight timescale required for completion.

The new roof will also help to keep heating costs down, and the electricity generated by the Kingspan PowerPanel system will make the facility inexpensive to run. Furthermore, SES will be able to tap into the new Feed In Tariff, speeding up the payback period on their investment.

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