

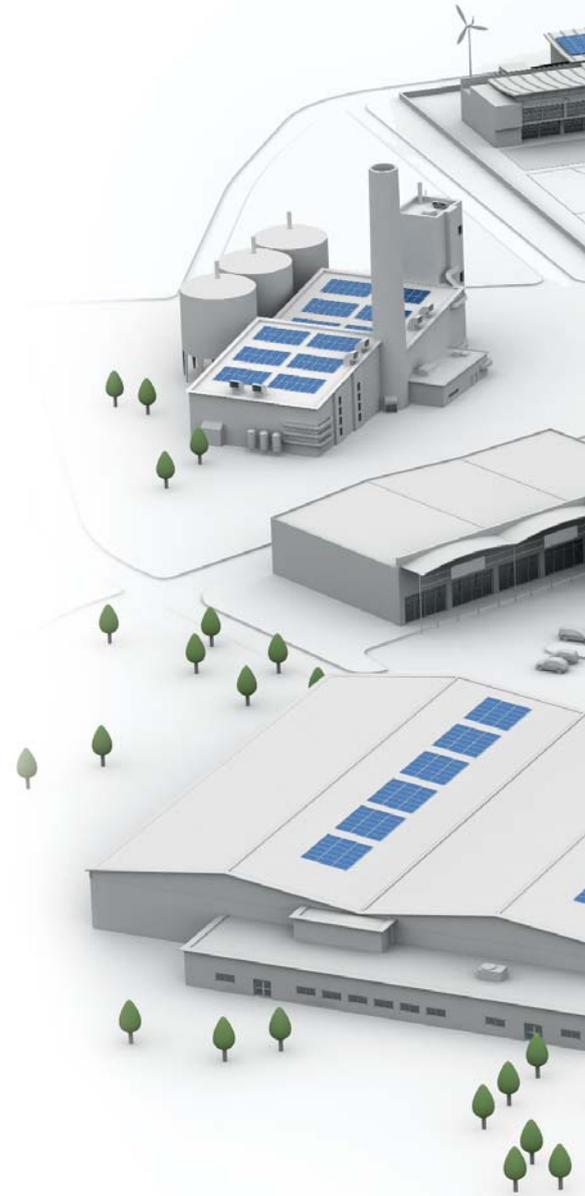
**retrofit**  
Energy Saving Solutions



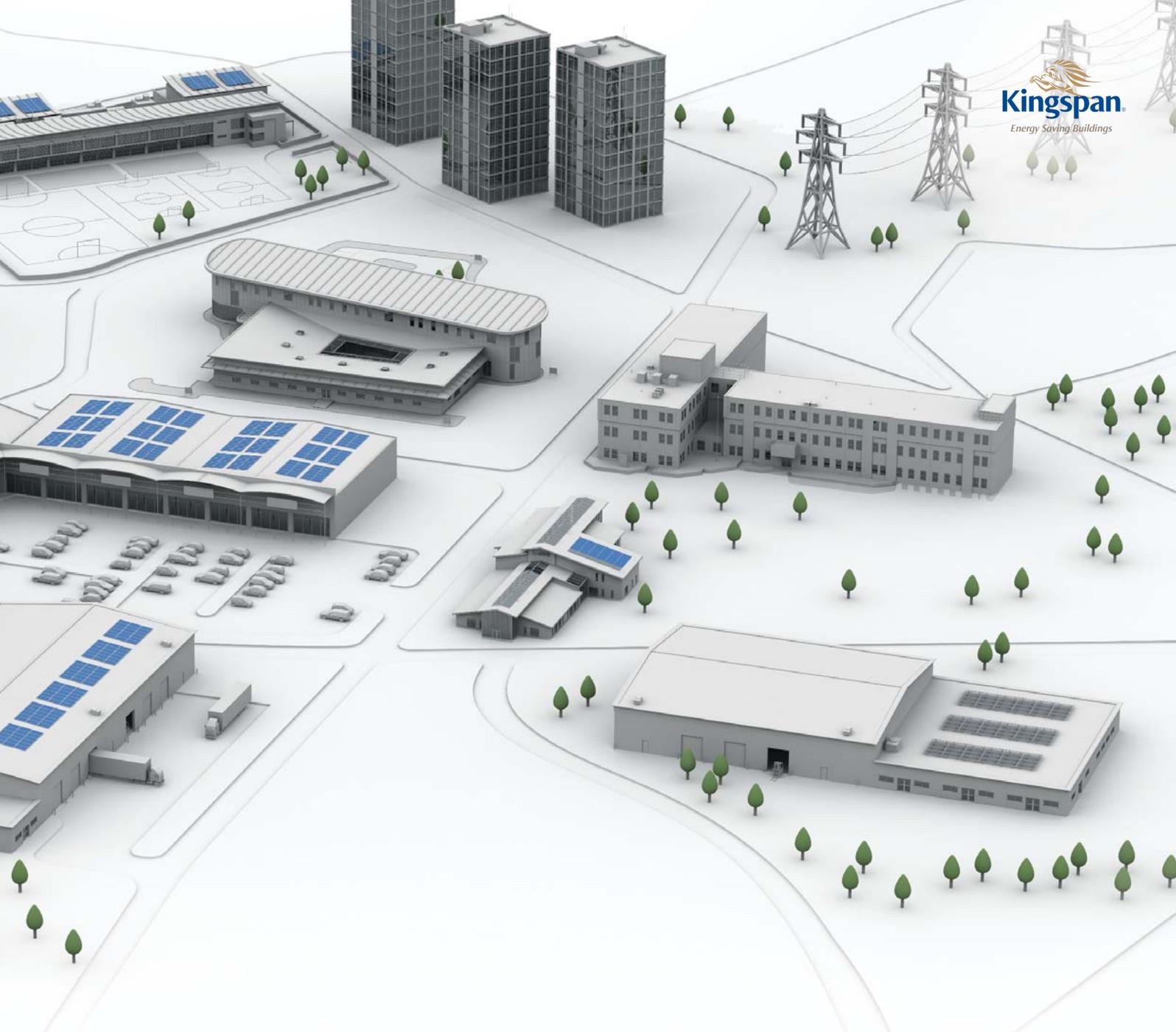
Non-Domestic Building Modernisation  
**What's in it for me?**

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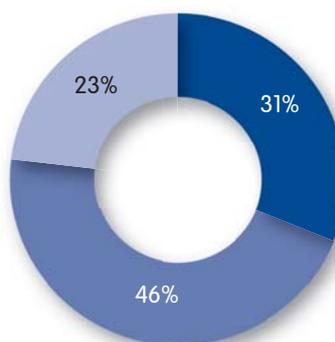
UK Government has set ambitious, legally binding targets (Climate Change Act 2008) to reduce greenhouse gas emissions by at least 34% up to 2020 and by at least 80% before 2050.<sup>1</sup>



**In order to meet these targets, the operational energy performance of existing non-domestic buildings must be fundamentally improved.**

- 1.8 million existing non-domestic buildings.
- Currently, non-domestic buildings account for 18% (106Mt CO<sub>2</sub>) of all UK emissions.
- Non-domestic buildings energy usage equals 300TWh per annum (approx £21.5 billion based on a 60:40 gas/electric split) – that is equivalent to the primary energy use of Switzerland<sup>2</sup>.
- 60% of these existing buildings will be in use in 2050, representing 40-45% of the total floor area.

Much of this existing building stock can be characterised as having poor energy performance<sup>3</sup>. Many buildings have poor fabric, inefficient plant, poor controls and low levels of occupant energy awareness. These buildings are becoming increasingly uncompetitive as energy prices spiral upwards and the demand for greener, more efficient properties rises.



**Age of UK non-domestic building stock**

- Pre 1940
- 1940 to 1985
- 1985 onwards

Source: BRE / Carbon Trust

<sup>1</sup> Against a 1990 baseline.

<sup>2</sup> Source: Carbon Trust / IEA energy data, 2007.

<sup>3</sup> Altering existing buildings in the UK; Energy Policy 36 (2008) 4482-4486; Simon Roberts.

# What needs to be achieved?

## The focus on energy demand reduction

Introduced by the Government under the Energy Performance of Buildings Directive (EPBD), Energy Performance Certificates (EPC) and Display Energy Certificates (DEC) are mechanisms used to characterise the energy performance of buildings with A\* to G ratings, similar to the ratings for household appliances.

**EPC** – Asset rating: models the theoretical, as designed, energy efficiency of a particular building.

**DEC** – Operational rating: records the actual CO<sub>2</sub>/m<sup>2</sup> emissions from a building over the course of a year, and benchmarks them against buildings of similar use.

EPCs and DECs provide an indication of the energy use and carbon emission of a building. These certificates communicate the improvements needed to meet carbon targets for the construction industry set by the Government.

Analysis has shown that DEC ratings need to improve by over 2 ratings by 2020, from an average of E to C. The improvement needs to be over 4 ratings by 2050, from an average of E to A (see data below)<sup>4</sup>.

Refurbishing the thermal characteristics of the UK's non-domestic building stock to an EPC / DEC rating of 'C' by 2022 would generate energy cost savings in the region of £5.65 billion per year with annualised savings of almost 4.74Mt of CO<sub>2</sub> every year in 2022. This could enhance national energy security by delivering primary energy savings of 24,000 GWh per annum<sup>5</sup>.

In addition, depending on work scheduling between 2011 and 2022, up to 50,000 long-term 'green' jobs could be created or retained on the basis of an average 100 person years gained from each £1 million in buildings energy efficiency<sup>6</sup>.

<sup>4</sup> DCLG (data); Carbon Trust and Arup analysis.

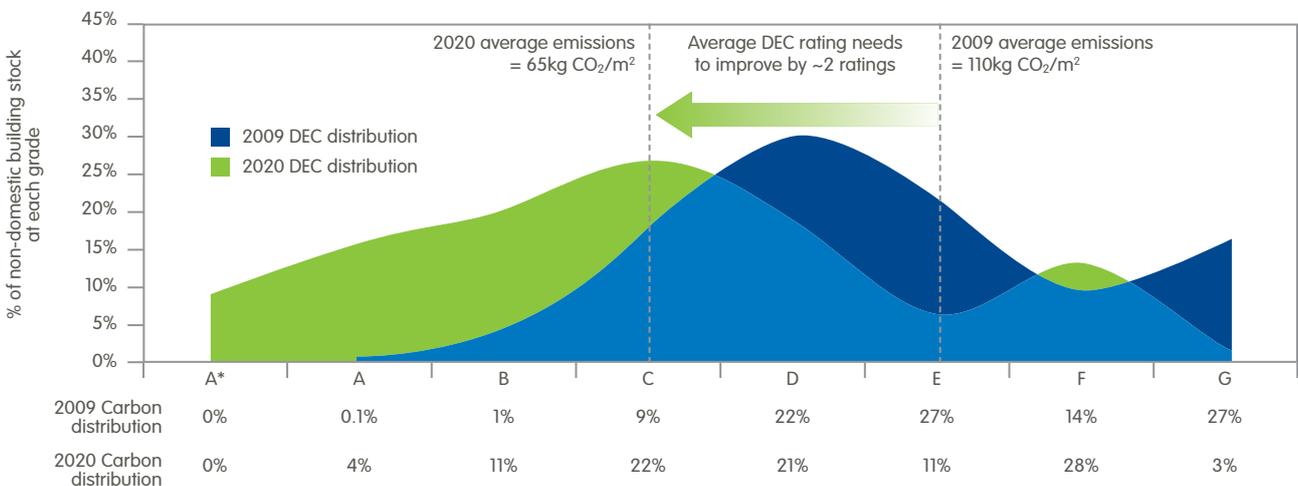
<sup>5</sup> The UK's approach to the thermal refurbishment of non-domestic buildings; Caleb Management Services Ltd; 2009.

<sup>6</sup> Climate change and employment: Case of the UK; CES-ETUC Study; 2006.

Data	Carbon reduction vs today	Average improvement in rating	Bottom end	Top end
2020	34%	~2 bands (E to C)	Almost no G ratings	~15% A/A*
2050	80%	~4 bands (E to A)	Almost no E, F & G ratings	~75% A/A*

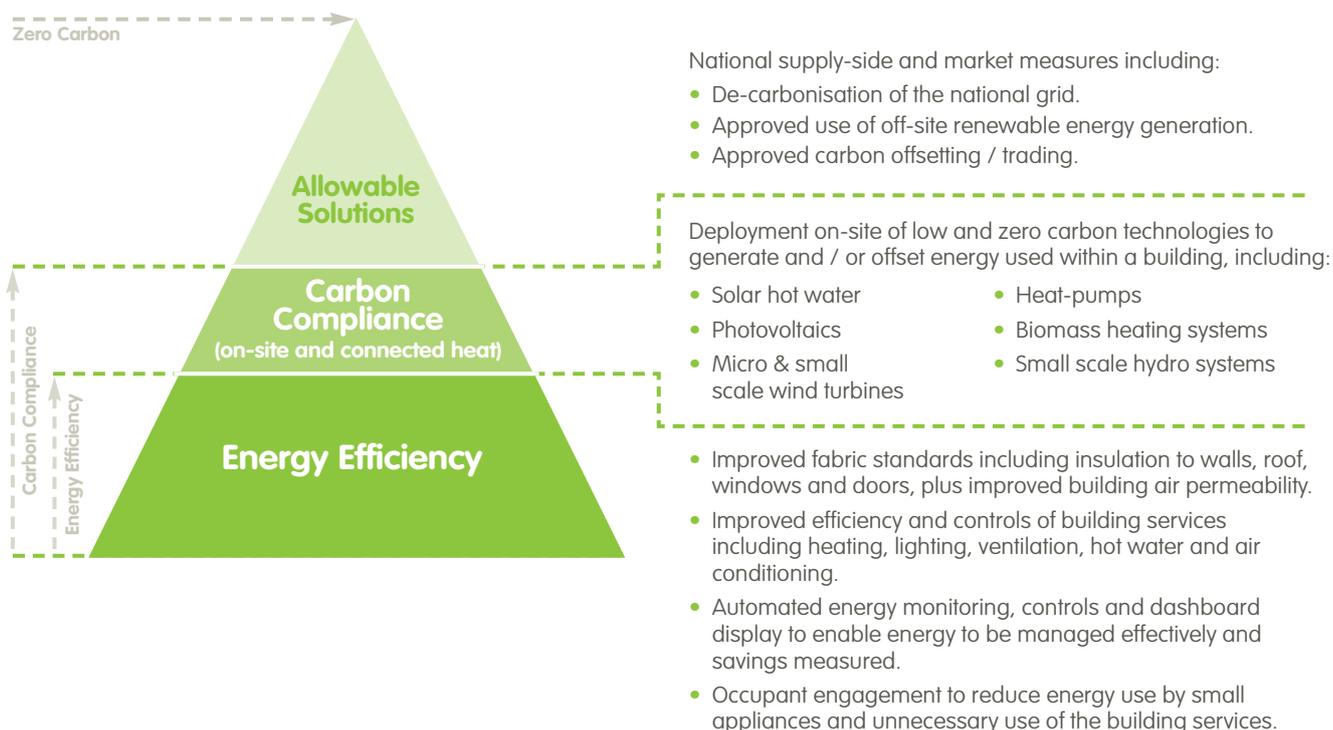


Shift in DEC profiles by 2020

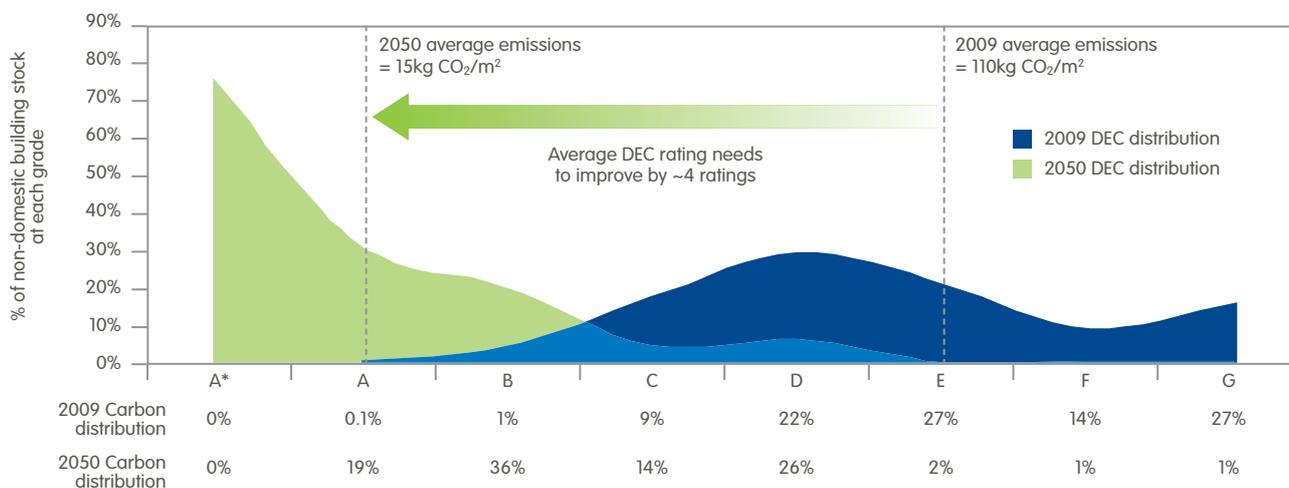


## The zero carbon agenda

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.



Shift in DEC profiles by 2050



# Why should I retrofit?

Today, the emphasis is on the energy performance of existing buildings and the first step to achieving real energy cost savings is to improve the thermal efficiency of the building envelope.

Retrofitting offers property investors, owners and occupiers a cost-effective route to substantially improve the energy performance, aesthetics and asset value of existing buildings.

There are numerous benefits associated with retrofitting properties and in most cases it can make economic, as well as environmental, sense to modernise or upgrade a building rather than demolish and totally rebuild. In some instances, retrofitting will save up to 60% compared with the cost of an equivalent new-build.

There are many reasons for retrofitting; from improving a building's overall performance to a purely aesthetic, business image upgrade.

## Retrofitting saves energy and saves you money.

### Property investors, owners and landlords retrofit to:

- Increase asset value and avoid impairment write-down;
- Increase tenant attractiveness and rental income;
- Reduce rental voids;
- Provide higher net-income growth with lower risk thereby delivering higher returns;
- Reduce CRC Energy Efficiency Scheme liability;
- Enhance corporate and business image;
- Support 'green lease' principles;
- Support Corporate Social Responsibility (CSR) and environmental sustainability objectives;

- Comply with current Building Regulation requirements and future-proof property portfolios; and
- Extend a building's economic life.

### Tenants and occupiers will benefit from:

- Reduced energy costs through improved thermal efficiency and building services management;
- Reduced impact of rising energy costs; and
- Improved working environment and staff retention.

Before ▾



**Main image:** After retrofit with Kingspan KS1000 MR insulated panels and Benchmark façade system.



Before ▾



# Why choose Kingspan?

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

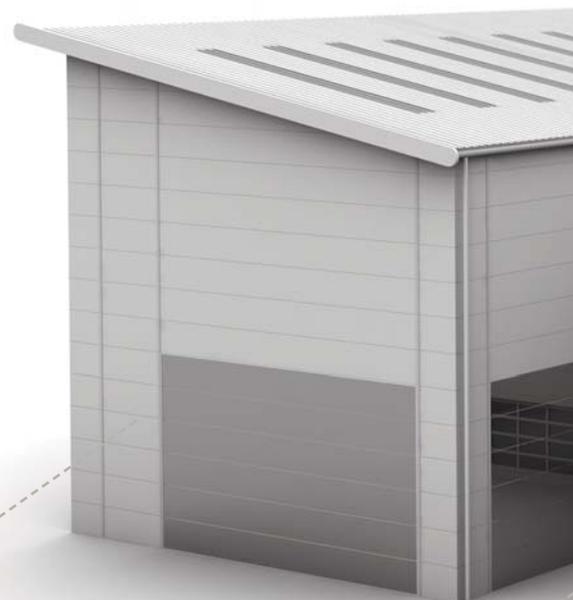
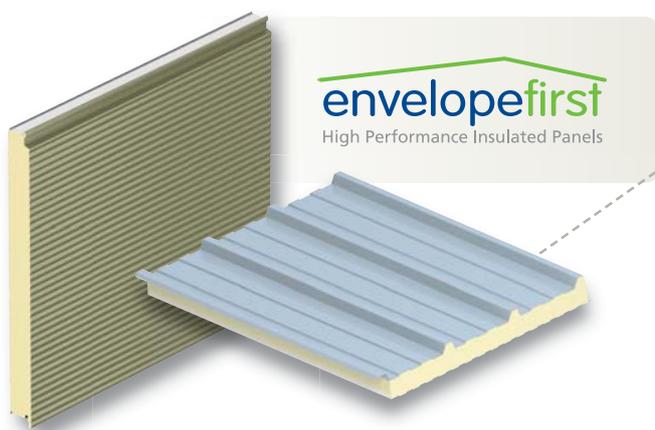
"...building insulation is the most cost-effective solution to reduce energy and greenhouse gases."

Source: McKinsey Global Institute

## Energy efficient retrofit starts with the EnvelopeFirst™

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.

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



## Services

Kingspan hot water storage units for use in conjunction with evacuated tube and flat plate solar thermal systems

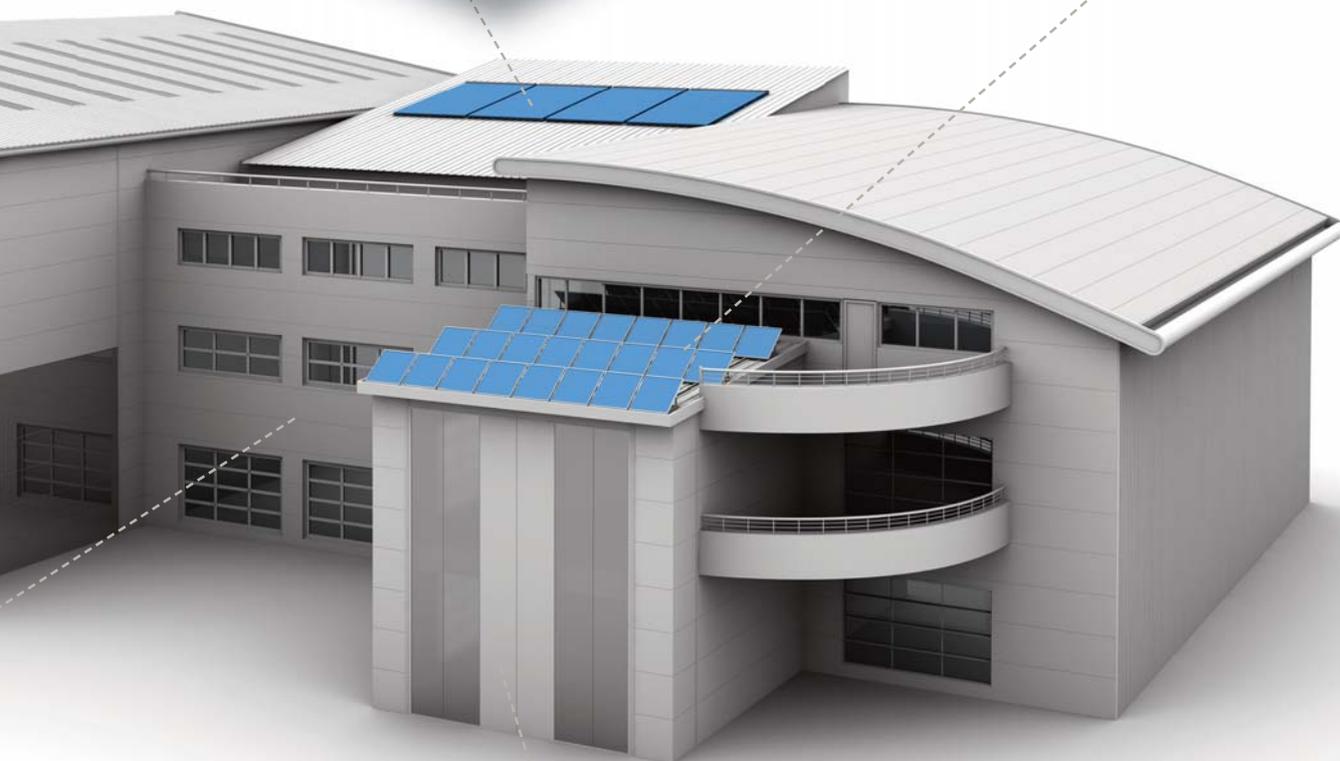
## powerpanel

Integrated Solar PV Solutions



## Solar Thermal

Kingspan high quality Thermomax evacuated tube or Marvel flat panel solar collectors complete with hot water storage cylinders.



## Air Source Heat Pumps

Kingspan AeromaxPlus range of high temperature heat pumps.



## Building Management Systems (BMS)

Kingspan recommends the installation of an appropriate BMS which will monitor and control energy usage and provide reports and visual information to assist with the optimum operation of the building services.

# How is it done?

A successful retrofit involves a simple, structured programme to determine the most effective energy efficiency improvement measures, costs 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 CO<sub>2</sub> reduction targets.

## Retrofit implementation programme



Kingspan has developed four retrofit solutions that will actively improve the performance of existing non-domestic buildings and provide real energy cost savings.

### Retro-1

**EnvelopeFirst™** – Upgrading of the building fabric with Kingspan high performance insulated panels, windows and doors to provide energy efficiency improvements in compliance with Building Regulations Part L2B and an airtightness of 10m<sup>3</sup>/m<sup>2</sup>/hr.

### Retro-2

**EnvelopePlus** – In addition to the measures taken in Retro-1, this involves the upgrading or replacement of any inefficient heating, cooling, lighting or other building services to comply with Building Regulations Part L2B. The improved fabric performance of Retro-1 will be reflected in the sizing, specification and operation of these building services.

### Retro-3

**Renewables** – Following the implementation of Retro-1 or Retro-2, Kingspan renewable energy technologies can be utilised to generate at least 10% of on-building energy, further reducing energy costs and CO<sub>2</sub> emissions.

### Retro-4

**Deep Renovation** – Through the combined application of higher fabric standards, enhanced building services and the use of renewable technologies, Retro-4 can reduce building CO<sub>2</sub> emissions by up to 80% and provide even greater savings on energy costs.

Before ▾



**Main image:** Visualisation created using the Retrofit Preview Service.

### Retrofit Preview Service

Kingspan have created the 'Retrofit Preview Service', a software package which produces an in-situ visualisation of the aesthetic results of refurbishment. This will enable you to view a realistic impression of the proposed completed retrofit solution; for example:

### Retrofit specialist contractors

Kingspan Retrofit will provide a list of specialist and Kingspan trained retrofit building envelope contractors.

Upon completion of the project, Kingspan Retrofit will issue the building owner with the 'Kingspan Retrofit Total Plus Guarantee' under which Kingspan and the specialist contractor will guarantee the thermal and structural performance and durability of the installed building envelope system for a period of 25 years.

### Case studies

Kingspan commissioned Elmhurst Energy to independently survey four existing non-domestic building types – education, retail, office and industrial – assessing their current condition and predicted energy consumption modelled using SBEM. The results for each individual building were analysed and the four Kingspan Retrofit solutions were applied to calculate achievable real life energy savings. Based upon Elmhurst Energy's results, Cyril Sweett provided solution specific cost analysis, including capital cost and payback.



elmhurst energy



cyril sweett  
global knowhow

# Case Study: Education

Ovingham Middle School, Northumberland,  
350 Pupils, 1970s Middle School, (1,600m<sup>2</sup>)

## After Retrofit

### Before

The existing building fabric consists of uninsulated cavity walls, curtain walls with asbestos panels, poorly insulated flat roof, solid floors and single glazed fenestration.

Building services include an original gas boiler system, gas water heater and fluorescent tube lighting.



	Existing Building	Retro-1 EnvelopeFirst™	Retro-2 EnvelopePlus	Retro-3 Renewables	Retro-4 Deep Renovation
EPC Rating	63 C	43 B	38 B	29 B	12 A
CO <sub>2</sub> (kg/m <sup>2</sup> /yr)	72.20	49.70	43.20	33.50	14.30
CO <sub>2</sub> Savings	n/a	33.51%	40.17%	53.60%	80.19%
Total Energy Consumption (kWh/m <sup>2</sup> /yr)	299.04	199.06	184.50	154.17	144.58
Energy Savings	n/a	33.43%	38.30%	48.45%	51.65%
<b>Savings (£/25yr)</b>	n/a	<b>£95,575</b>	<b>£140,497</b>	<b>£291,266</b>	<b>£658,735</b>

# Case Study: Office

Warwickshire Borough Council Offices, 300 Staff,  
1981 3/4 Storey Building, (3065m<sup>2</sup>)

## After Retrofit ↘



### Before ↘

The existing building fabric consists of uninsulated cavity walls, uninsulated ground floor, poorly insulated flat roof and 1980s double-glazing.

Building services include an original gas boiler system, uninsulated hot water store and fluorescent tube lighting.



	Existing Building	Retro-1 EnvelopeFirst™	Retro-2 EnvelopePlus	Retro-3 Renewables	Retro-4 Deep Renovation
EPC Rating	73 C	58 C	47 B	39 B	15 A
CO <sub>2</sub> (kg/m <sup>2</sup> /yr)	47.70	37.40	30.70	25.60	9.50
CO <sub>2</sub> Savings	n/a	21.59%	35.64%	46.33%	80.08%
Total Energy Consumption (kWh/m <sup>2</sup> /yr)	151.92	98.00	73.16	64.01	25.08
Energy Savings	n/a	35.49%	51.84%	57.87%	83.49%
<b>Savings (£/25yr)</b>	n/a	<b>£101,423</b>	<b>£172,914</b>	<b>£321,398</b>	<b>£526,561</b>

For further information visit:

[www.kingspanrefit.com](http://www.kingspanrefit.com)

# Case Study: Retail

Homebase Store, Liverpool, (3,930m<sup>2</sup>)

## After Retrofit ↘



### Before ↘

This retail unit comprises uninsulated metal clad and cavity walls, uninsulated ground floor and poorly insulated roof with rooflights. Windows are single-glazed.

Building services include a gas-fired convector system and low temperature hot water boiler for radiators. Separate toilet and office facilities have fluorescent tube lights and main retail area has metal halide light fittings.



	Existing Building	Retro-1 EnvelopeFirst™	Retro-2 EnvelopePlus	Retro-3 Renewables	Retro-4 Deep Renovation
EPC Rating	49 B	36 B	35 B	27 B	10 A
CO <sub>2</sub> (kg/m <sup>2</sup> /yr)	82.30	60.40	58.50	44.90	16.17
CO <sub>2</sub> Savings	n/a	26.61%	28.92%	45.44%	80.35%
Total Energy Consumption (kWh/m <sup>2</sup> /yr)	269.26	158.86	150.34	96.81	54.98
Energy Savings	n/a	41.00%	44.17%	64.05%	79.58%
<b>Savings (£/25yr)</b>	n/a	<b>£179,471</b>	<b>£197,029</b>	<b>£619,530</b>	<b>£994,235</b>

# Case Study: Industrial

Lunn Engineering, Warwickshire, 30 Staff,  
Early 1960s Building, (994m<sup>2</sup>)

## After Retrofit ↘



### Before ↘

Process area: uninsulated asbestos roof, single glazed rooflights, cavity walls, uninsulated asbestos sheeting and uninsulated ground floor with gas warm air blower. Fluorescent tube lighting.

Office area: poorly insulated flat roof, cavity walls and uninsulated ground floor with 1980s gas boiler system. Tungsten lighting.



	Existing Building	Retro-1 EnvelopeFirst™	Retro-2 EnvelopePlus	Retro-3 Renewables	Retro-4 Deep Renovation
EPC Rating	203 G	62 C	51 C	41 B	41 B
CO <sub>2</sub> (kg/m <sup>2</sup> /yr)	198.70	61.10	50.20	33.50	33.50
CO <sub>2</sub> Savings	n/a	69.25%	74.74%	83.14%	83.14%
Total Energy Consumption (kWh/m <sup>2</sup> /yr)	872.10	177.27	149.81	126.24	126.24
Energy Savings	n/a	79.67%	82.82%	85.52%	85.52%
<b>Savings (£/25yr)</b>	n/a	<b>£285,692</b>	<b>£316,107</b>	<b>£411,432</b>	<b>£411,432</b>

For further information visit:

[www.kingspanrefit.com](http://www.kingspanrefit.com)

# What are the solutions?

Whether you are a small business or a large multi-national, whether you are planning aesthetic improvements or a deep renovation, Kingspan Retrofit provides fast, cost-effective energy saving solutions.

If your building has a flat roof that is past its design life, but you need to minimise business disruption, then the Kingspan Retrofit Flat to Pitched Roof Conversion System is the ideal solution.

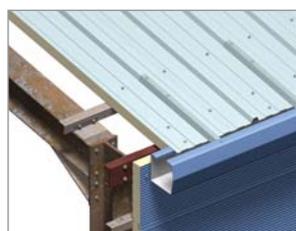


## Flat to Pitched Roof Conversion

If your building has a flat roof that is past its design life, but you need to minimise business disruption, then the Kingspan Retrofit Flat to Pitched Roof Conversion System is the ideal solution. Individually designed to fit over your existing roof, flat to pitched systems provide a fast, cost-effective and fully guaranteed solution.

## Strip & Re-sheet or Overcladding

Depending on the condition, or material, of your building's current roof or wall construction, there are two main options for refurbishment – removal of the external fabric to the main structure or directly recovering the existing fabric with a new cladding system.



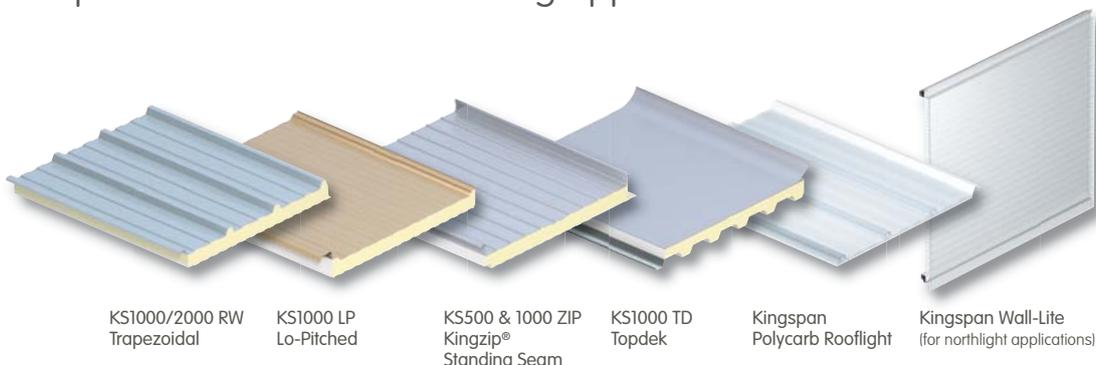
Strip & Re-Sheet



Overclad

# Insulated Roof Systems

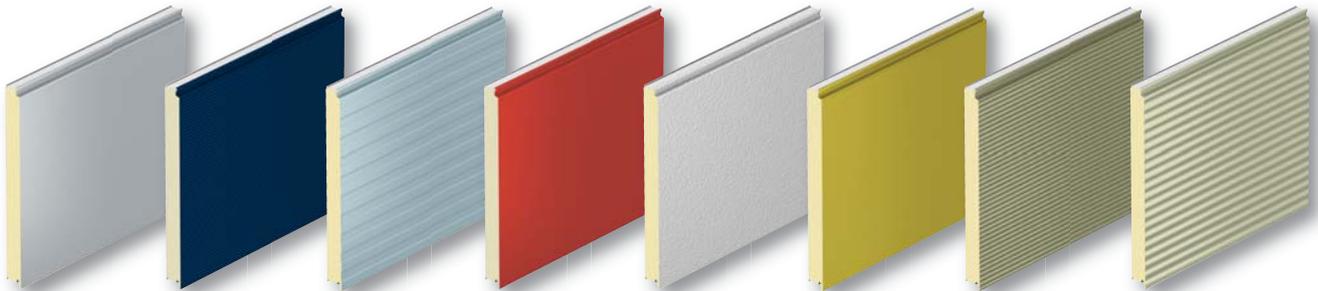
Strip & Re-Sheet or Overcladding applications



**Main image:** After retrofit with Kingspan Flat-to-Pitched overroofing solution and insulated panels.

# Insulated Wall Systems

Strip & Re-Sheet or Overcladding applications



KS600, 900 & 1000 Optimo™

KS600, 900 & 1000 MR Micro-Rib

KS600, 900 & 1000 EB Euro-Box

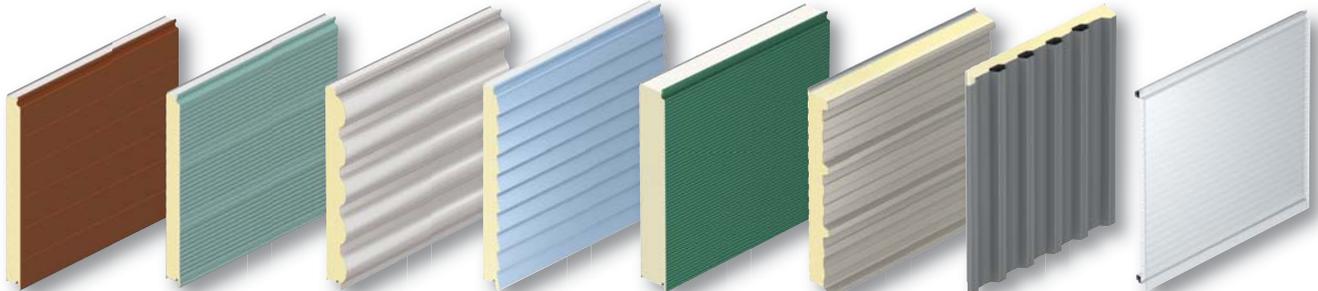
KS600, 900 & 1000 FL Flat

KS600, 900 & 1000 FL-S Stucco

KS600, 900 & 1000 MM Mini-Micro

KS600, 900 & 1000 CX Convex

KS600, 900 & 1000 WV Wave



KS600, 900 & 1000 PL Plank

KS600, 900 & 1000 TL Tramline

KS1000 CW CurveWall

KS1000 LV Louvre

KS600, 900 & 1000 LS Longspan™

KS1000/2000 RW Trapezoidal

Kingspan EnergiPanel™

Kingspan Wall-Lite



# Benchmark

## Strip & Re-Sheet or Overcladding applications

Benchmark brings together all the elements to help you create the ultimate building envelope solution to fit your building designs and specifications. Inspirational façades in exciting colours, textures and finishes. Roof systems that raise the standard in performance. All backed with the Total Benchmark Guarantee and thorough testing procedures.

With a wide choice in colour and texture, there are no limits to what you can create with Benchmark façades. From modern metallic and photovoltaics to warm wood finishes, we've combined style and performance to offer you the complete façade solution without having to compromise.

The system comprises the Benchmark Karrier Panel that has been specifically designed and tested to support Benchmark's ranges of stunning façades. Alternatively the Metallic cassettes available in Steel, Aluminium, ACM (Aluminium Composite Material), Copper and Zinc, in five different cassette options are available as part of an overcladding application.

For further information on the full Benchmark façade range and building options, please visit [www.kingspanbenchmark.com](http://www.kingspanbenchmark.com)



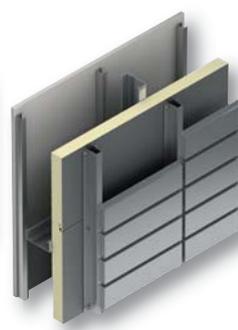
Metallic Hook-On-Cassette System



Metallic Interlocking Plank System



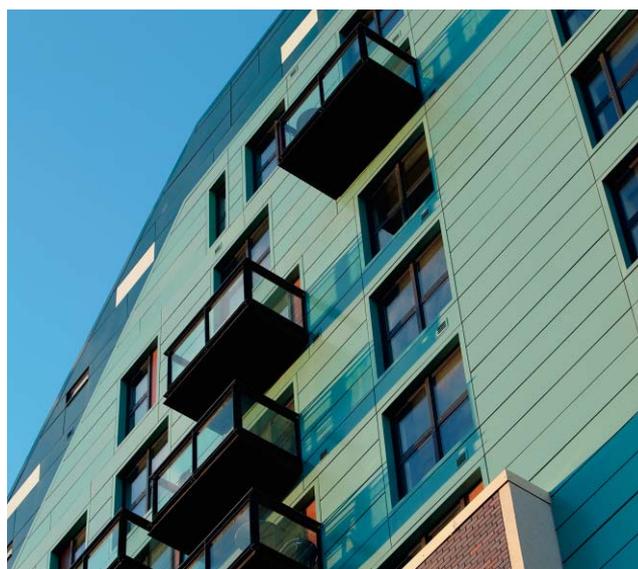
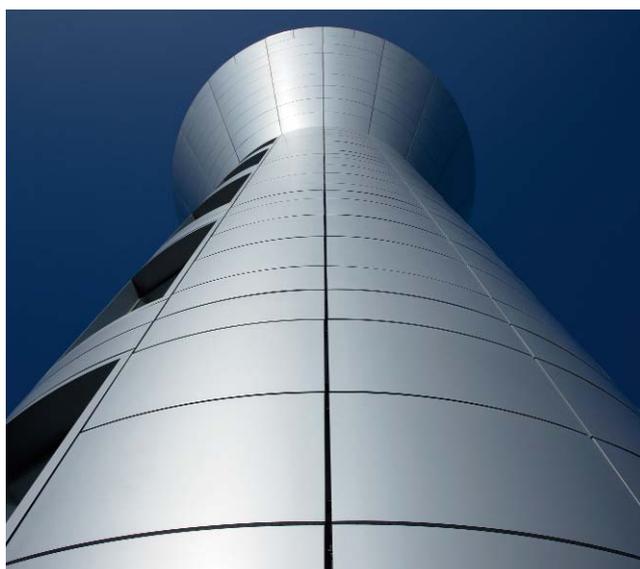
Metallic Shingle System



Metallic Recessed-Fix Cassette System



Metallic Tray System

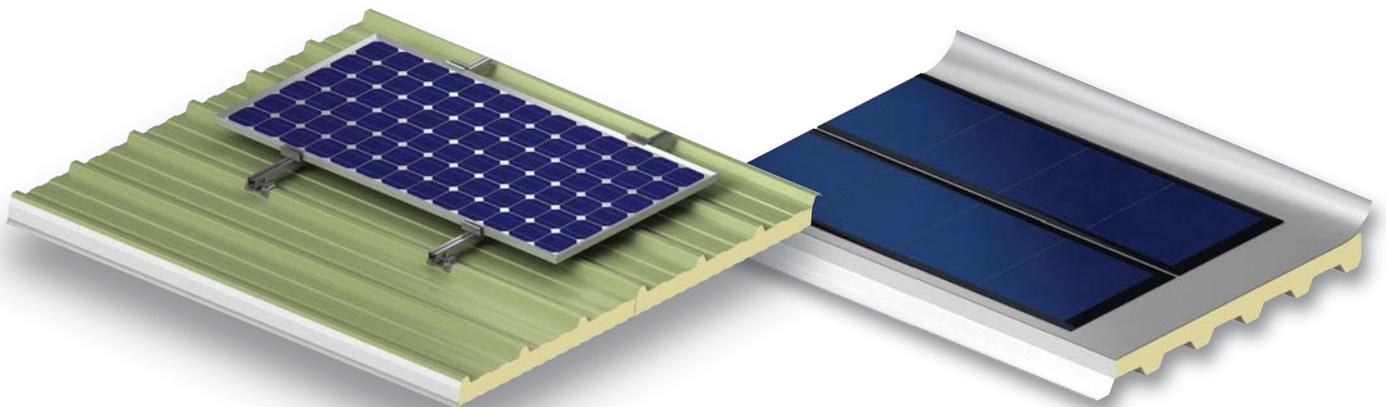


# powerpanel: Put your roof to work!

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



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

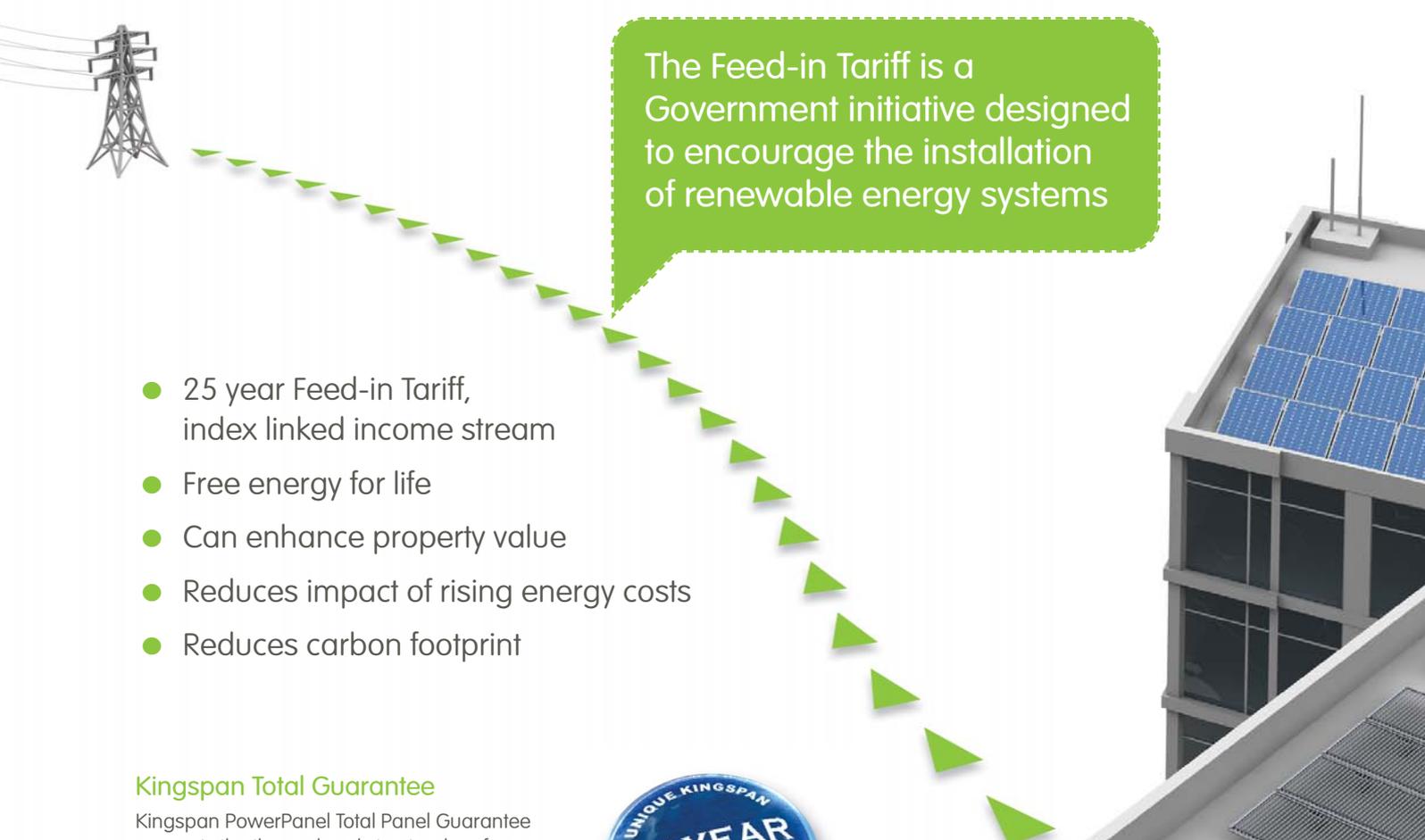


## Roof powerpanel Module

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

## Roof powerpanel Laminate

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

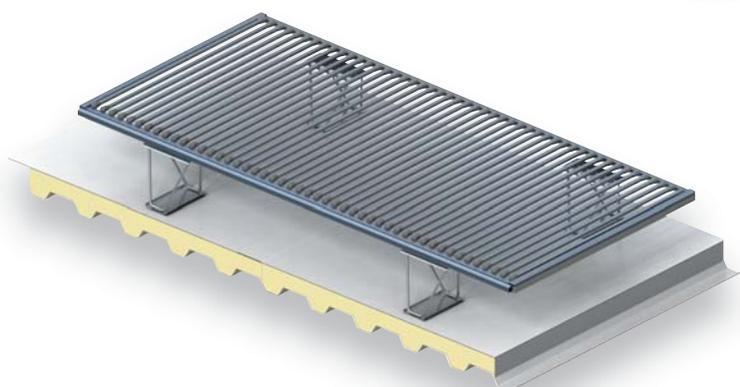


The Feed-in Tariff is a Government initiative designed to encourage the installation of renewable energy systems

- 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

### 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.



### Solyndra® powerpanel Module

Roof mounted solution consisting of tubes of cells that catch solar radiation across their entire surface used in conjunction with Kingspan Topdek single-ply membrane panel.

# Solar Thermal and Air Source Heat Pumps

By the middle of 2011 the **Renewable Heat Incentive** (RHI) will be introduced, offering similar benefits as the FiT, for the generation of heat from renewable sources such as solar thermal and air source heat pump technologies from Kingspan Renewables.

## Air Source Heat Pumps

Designed specifically for both new and retrofit commercial applications, the Kingspan Aeromax Plus range of high-temperature heat pumps are suitable for the heating of offices, care homes, hospitals, apartments and hotels.

### Features and benefits

- Certified to the Eurovent energy efficiency class A with a coefficient of performance (COP) of over 4 – compliant with Ecolabel certification.
- 22kw to 105kw nominal heating capacity.
- Incorporates a hydronic module with a multi-speed pump, as standard. An optional hydronic module with a variable-speed pump that automatically adapts to the system requirements is also available.
- Minimal noise disturbance from the unit.
- Ozone-friendly R-407C refrigerant.
- Operating range allows outside temperatures down to -20°C, with continuous hot water production at 65°C.
- Small footprint and low height.
- Intelligent controls with operating simplicity.
- Simple pipework and wiring connections.



## Solar Thermal

Currently the most cost-effective, affordable renewable energy technology currently available, solar thermal water heating technology collects the sun's energy to heat water.

Solar energy is converted into heat to generate hot water for commercial buildings whilst at the same time helping to reduce carbon emissions and global warming. The process is simple, effective and entirely renewable.

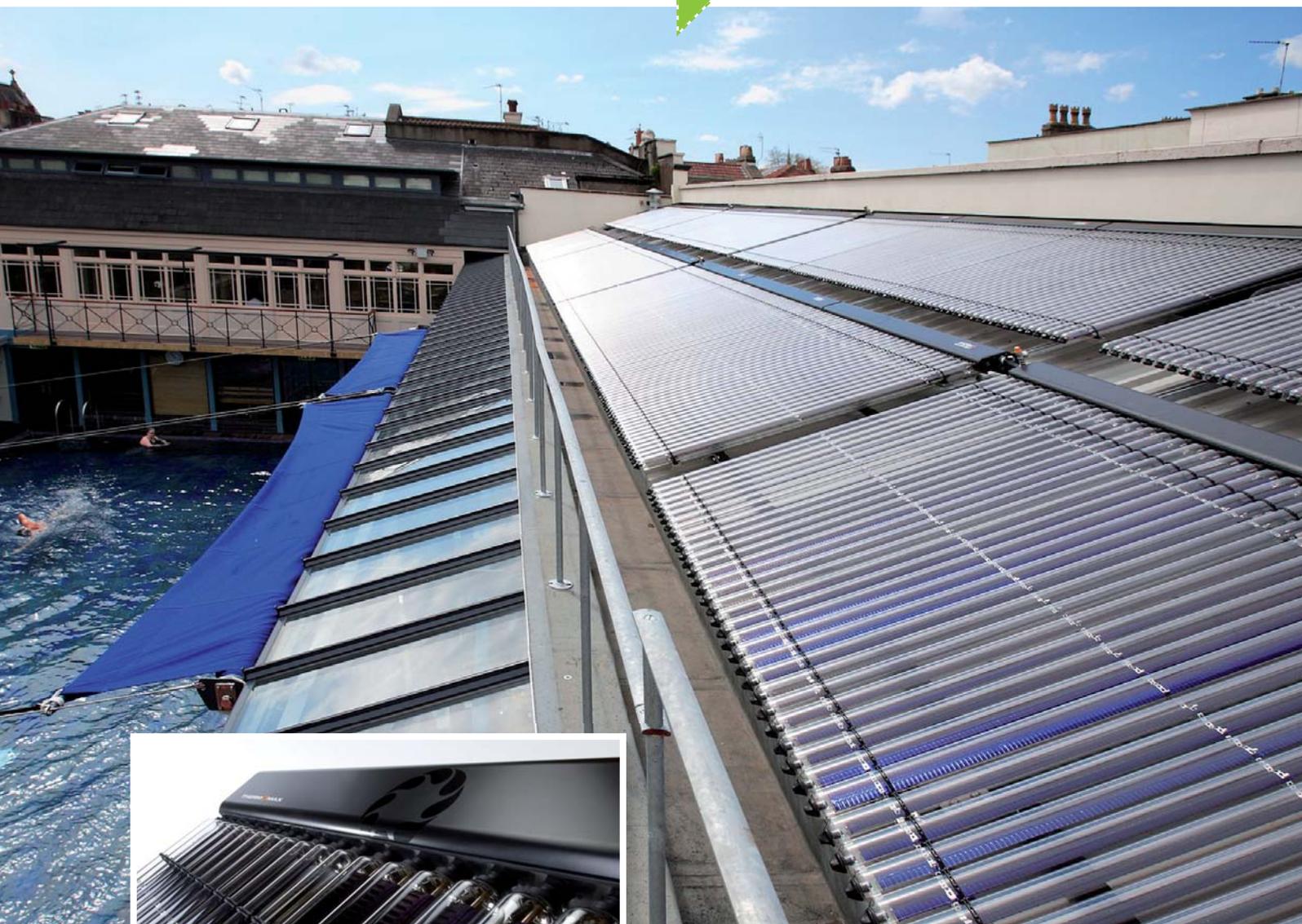


### Features and benefits

- Safe, clean, environmentally friendly generation of hot water.
- Available as flat plate or evacuated tube systems
- Unique and patented evacuated tube solutions manufactured in the UK.
- Rapid conductivity and transfer of energy into heat.
- Evacuated tubes are up to 30% more effective than conventional flat plate panels (Source: SPF Test).
- Designed and manufactured specifically for Northern European climates.
- User friendly with long service life.
- Certified under the Microgeneration Certification Scheme (MCS).
- Network of fully approved Accredited Installers.
- Site design support.



Get free hot water and benefit from the 'RHI'



# What are the other issues?

## Construction Design & Management

The CDM 2007 Regulations are about focusing attention on effective planning and management of construction projects, from design concept onwards. The aim is for Health and Safety considerations to be treated as a normal part of a project's development, not an afterthought or bolt on extra. The object of the new CDM 2007 Regulations are to reduce the risk of harm to those that have to build, use and maintain structures.

CDM 2007 applies to all construction projects where people are at work. The new Regulations are divided into five parts:

- Part 1 deals with the application of the Regulations and definitions.
- Part 2 covers general duties that apply to all construction projects.
- Part 3 contains additional duties that only apply to notifiable construction projects, i.e., those lasting more than 30 days or involving more than 500 person days of construction work.
- Part 4 contains practical requirements that apply to all construction sites.

More information can be obtained from [www.hse.gov.uk/construction/cdm.htm](http://www.hse.gov.uk/construction/cdm.htm)

## Tax relief for property refurbishments and fit-outs

Tax relief for property refurbishments will be available in the form of capital allowances, revenue deductions and land remediation relief. The following provides a general overview of the tax reliefs potentially available.

The actual relief available will vary according to the project type and the tax status of the investor incurring expenditure on the refurbishment. As such, the following reliefs will not be available in all scenarios and specialist advice in respect of each individual project should be sought.

### Capital allowances

Capital allowances are available to investors who incur refurbishment expenditure. The available allowances can be utilised to offset the tax liability on profits derived from the investor's business.

The allowances are available in the following forms.

- Plant and machinery allowances
- Integral features allowances
- Enhanced capital allowances

The allowances are written down on an annual basis. Enhanced capital allowances, for expenditure incurred on energy and water efficient technologies, are available in full in the year when the project expenditure is incurred.

The following table identifies the likely level of allowances available by property type as a proportion of the project expenditure.

Property type	Range of allowances	
	Minimum	Maximum
Office refurbishment	40%	65%
Office fit-out	50%	75%
Shopping centre refurbishment	20%	50%
Retail unit fit-out	60%	100%
Hotel refurbishment	40%	75%

### Revenue deductions

Most refurbishment projects will include a proportion of repair and maintenance works. This could include redecoration works, electrical rewiring and repair works to existing assets.

Subject to the deferred revenue rules, this expenditure can be claimed as a revenue deduction and carried to the profit and loss account of the investor. In this way, it has immediate effect as a deduction against their tax liability in the year in which the expenditure is incurred.

### Land Remediation Relief

Land Remediation Relief (LRR) is available for expenditure incurred on the remediation of contaminated land and buildings. The land must be located in the United Kingdom and acquired for property investment or a trade carried on by a company. Only companies can claim this relief.

The contamination must be the source of harm or potential harm. Examples of qualifying works include asbestos removal or encapsulation, hydrocarbon remediation and works to remediate Japanese knotweed.

Land Remediation Relief is available at a rate of 150% against the qualifying expenditure incurred. In effect, for every £100,000 of qualifying expenditure, £150,000 of tax relief will be available.



**Main image:** After retrofit with Kingspan KS1000 RW Trapezoidal insulated panels and Polycarb Rooflights.

Before ↘



### Control of Asbestos Regulations 2006

The Control of Asbestos Regulations 2006 came into force on 13 November 2006 (Asbestos Regulations - SI 2006/2739)

These Regulations bring together the three previous sets of Regulations covering the prohibition of asbestos, the control of asbestos at work and asbestos licensing.

The Regulations prohibit the importation, supply and use of all forms of asbestos. They continue the ban introduced for blue and brown asbestos in 1985 and for white asbestos in 1999. They also continue to ban the second-hand use of asbestos products such as asbestos cement sheets and asbestos boards and tiles; including panels which have been covered with paint or textured plaster containing asbestos.

#### Duty to manage asbestos

Existing asbestos-containing materials, if in good condition, **may** be left in place but **must** be monitored and managed to ensure they are not disturbed.

#### Working with asbestos

Asbestos regulations require employers and self-employed to prevent exposure to asbestos fibres.

#### Asbestos removal

Most asbestos removal must be undertaken by a licensed contractor.

#### Clearance Certificate

Prior to re-occupation, a certificate from UKAS must be obtained.

#### Training

The Regulations require mandatory training for anyone liable to be exposed to asbestos fibres at work (see regulation 10). This includes maintenance workers and others who may come into contact with or who may disturb asbestos (eg cable installers) as well as those involved in asbestos removal work.

# What are the relevant Building Regulations for retrofit?

Building Regulations Approved Document Part L2B 2010 defines the energy efficiency requirements for retrofitting existing non-domestic buildings.

Part L2B sets out appropriate measures for the conservation of fuel and power, under Building Regulations, when undertaking modernisation works on existing non-domestic buildings.

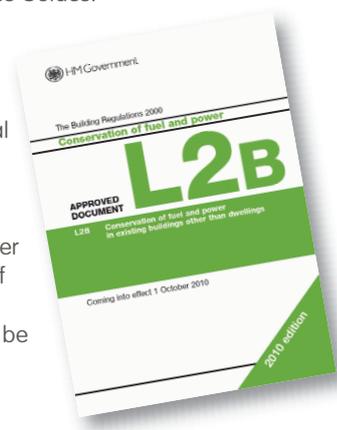
2010 revisions have largely left the compliance process unchanged, but the minimum standards have been improved, specifically minimum standards required when undertaking:

- Refurbishment(s);
- Certain extensions (large extensions greater than 100m<sup>2</sup> and greater than 25% of the total useful floor area of the existing building would be covered by L2A);
- Material change of use (conversions to other use);
- Consequential Improvements (required for example when extending larger buildings); and
- Standards for new and replacement building services.

Generally, the approach to compliance for existing buildings remains elemental, not carbon target based as in new build, with:

- Building fabric requirements as before, based on minimum U-values when providing a new thermal element;
- Standards for replacement fittings;
- Requirements to improve the U-value when upgrading or retaining an existing thermal element if a threshold U-value is exceeded; and
- Building services minimum efficiencies and controls provision including metering requirements as defined by the Building Services Compliance Guides.

The construction of an extension for buildings with a total useful floor area over 1000m<sup>2</sup> triggers the requirement for 'Consequential Improvements' under Building Regulations. Additionally, where a proposed extension has a total useful floor area that is both greater than 100m<sup>2</sup> and more than 25% of the total useful floor area of the existing building, the work should be regarded as a new building.



## New thermal envelope requirements

	2006	2010
<b>Wall</b>	0.35 W/m <sup>2</sup> K (60mm)	0.28 W/m <sup>2</sup> K (75-80mm)
<b>Roof</b>	0.25 W/m <sup>2</sup> K (80-90mm)	0.18 W/m <sup>2</sup> K (100-120mm)
<b>Glazing</b>	2.20 W/m <sup>2</sup> K	1.80 W/m <sup>2</sup> K

Thicknesses relate to typical panel solutions.

## Upgrading retained thermal envelope

	2006	2010
<b>Wall</b>	0.35 W/m <sup>2</sup> K (60mm)	0.30 W/m <sup>2</sup> K (70mm)
<b>Roof</b>	0.25 W/m <sup>2</sup> K (80-90mm)	0.18/0.20* W/m <sup>2</sup> K (100-120mm)
<b>Glazing</b>	2.20 W/m <sup>2</sup> K	1.80 W/m <sup>2</sup> K

Thicknesses relate to typical panel solutions.

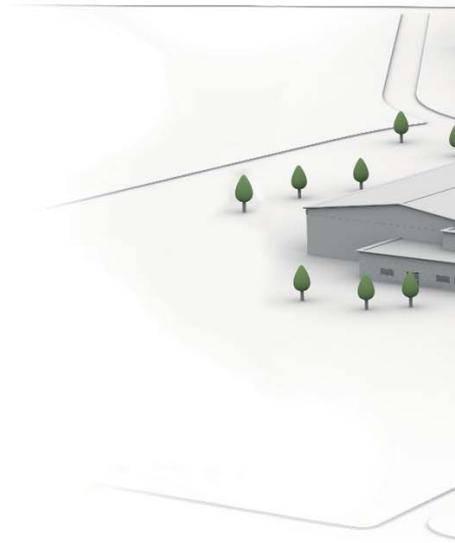
\* Subject to factors such as load bearing capacity of the frame.



Before ▾



**Main image:** After retrofit with Kingspan KS1000 Optimo™ insulated panels.



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