



Kingspan[®]





Donald J. Trump ✓

@realDonaldTrump



Following

The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.

RETWEETS

24,831

LIKES

14,654



2:15 PM - 6 Nov 2012



Charleston SC Sept 11th 2017



Buildings Are At Fault

What is the Link?

An aerial photograph of a modern architectural complex. The buildings feature large, white, ribbed roofs and are surrounded by lush green trees and landscaped grounds. The scene is captured during the golden hour, with warm sunlight casting long shadows and highlighting the textures of the buildings and foliage.

Climate change is the fundamental design problem of our time. Not education, not community, not health, not justice.

The threat climate change poses is existential, and **buildings** are hugely complicit—even more so than the automobile.

Buildings consume 40% of our energy annually, and they emit nearly half of the CO₂, through greenfield development, cement production, and the burning of fossil fuels

CO₂ is the chief agent of climate change, **making buildings—and by association, the manufacturers—profoundly responsible.**

\$35tn

combined value of the world's largest companies by market capitalization, according to MSCI. That's twice the GDP of the USA in 2015.

31 gt

GHG emissions produced globally each year. That's equivalent to 8,139 coal power stations.

\$5.5tn

estimated global market for low-carbon goods and services. That's half of China's GDP in 2015.



Fighting climate change is vital for a sustainable economy. CDP has been putting critical environmental data at the heart of business decisions for 15 years.

1/5

of global emissions are now managed through CDP, as reported by companies who represent over half the global market cap.

827

investors are now requesting data from companies through CDP's climate change program. These investors represent US \$100tn.

5,500

companies responded to our annual climate change questionnaire in 2015.

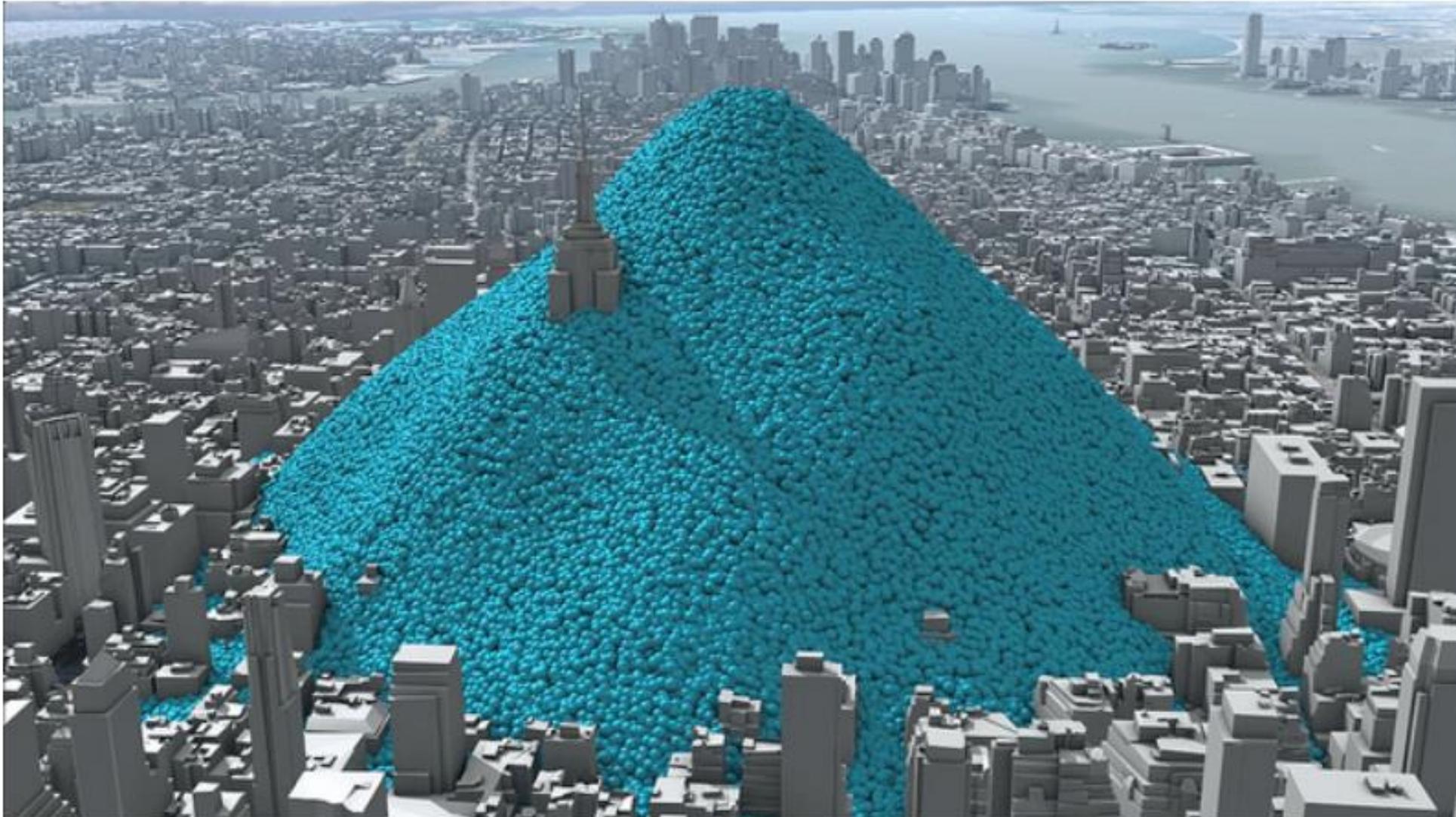
How do we
get there?

We face a choice:



To remake the built environment so that it produces no CO₂, or to carry on, business as usual, and live with the consequences

Not So Zero Carbon Buildings



Why we need to make embodied carbon count.

A cubic yard of concrete (3,800 lbs), generates 350 pounds of CO₂. That's a 15'x15'x15' cube of CO₂

NYC's daily carbon emissions
1.1 ton per spheres.

Reduce the Embodied Energy in Products



**DESIGN
STRATEGIES**



**TECHNOLOGIES
AND SYSTEMS**



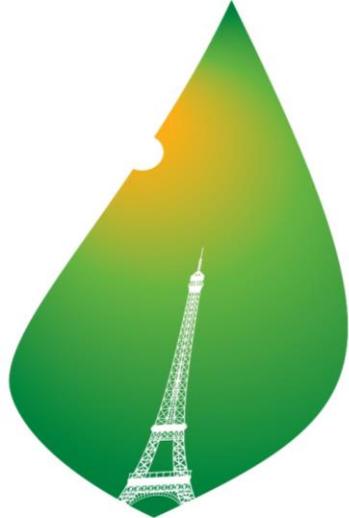
**OFF-SITE RENEWABLE
ENERGY**



We are not alone in our thinking...



COP24-KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21-CMP11



Google



Walmart



Bloomberg

Coca-Cola Enterprises



BMW
GROUP

PHILIPS

“Together we have the opportunity to make our built environments more energy efficient, attractive, adaptable, environmentally sensitive and productive. The way we build can be more effective and reach higher standards than ever before. We can make our buildings really work for us; consuming and generating energy smartly to become real investments in our future.”

Gene M. Murtagh
Chief Executive Officer, Kingspan Group

NZE

2020

Putting Our Energy
Into Change

A Simple Strategy



By 2020 all Kingspan energy needs will be met through renewable energy.

In 2011, Kingspan Group set out to achieve the improbable, and to turn that ideal into a viable reality, with the target of becoming a Net Zero Energy Company by 2020.



Save More, Generate More, Buy More

RE 100



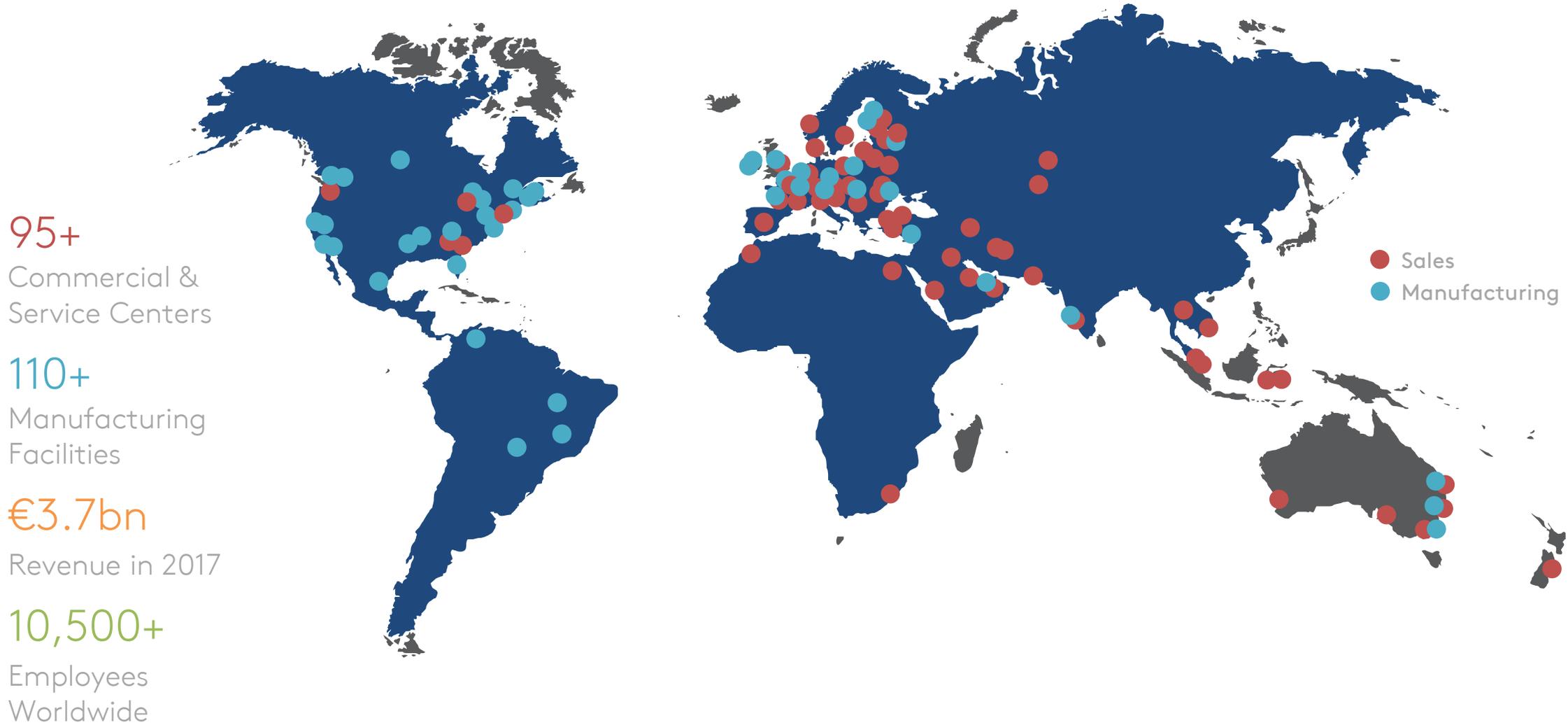
A true global leader:



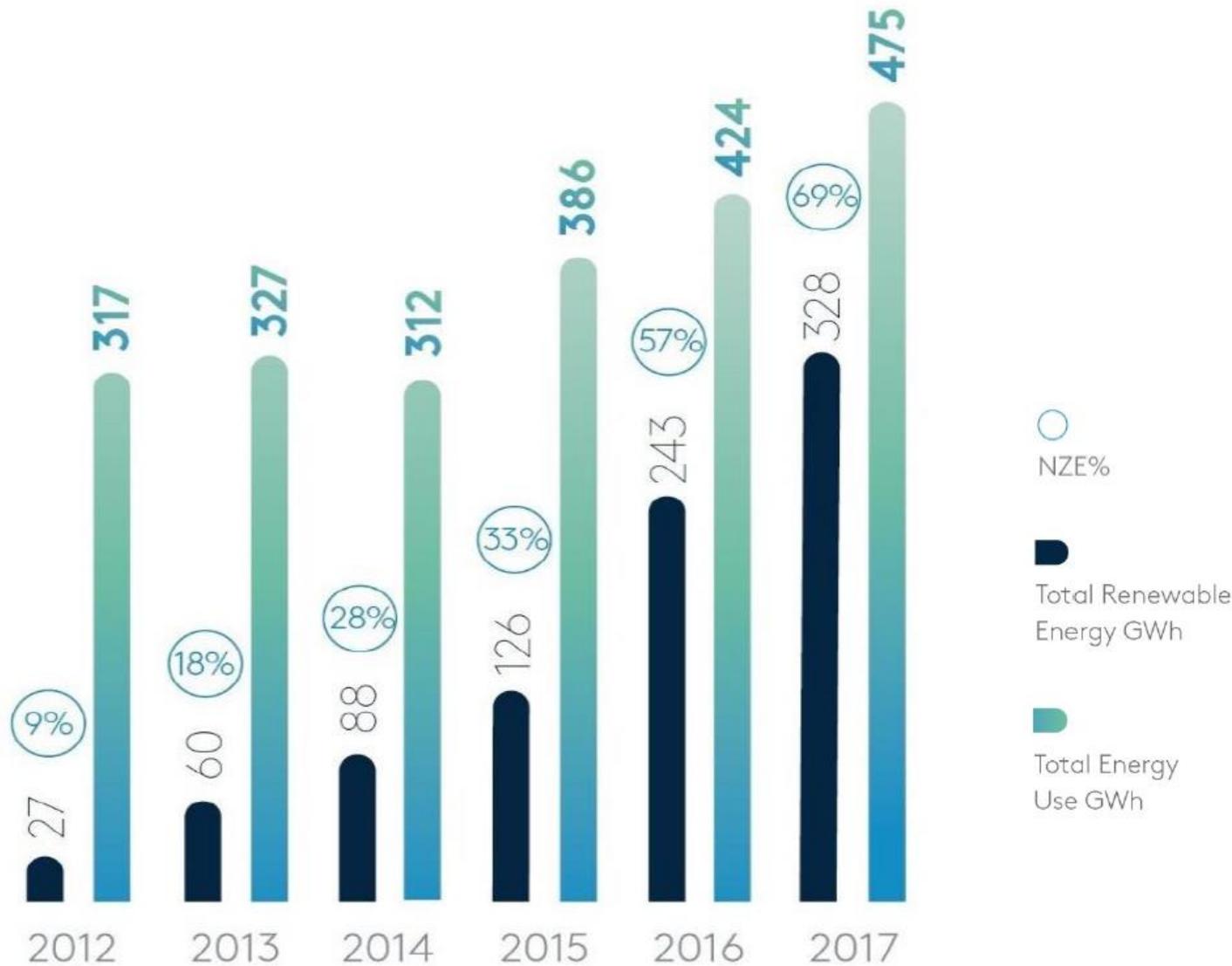
The work of CDP is crucial to the success of global business in the 21st century... helping persuade companies throughout the world to measure, manage, disclose and ultimately reduce their greenhouse gas emissions. No other organization is gathering this type of corporate climate change data and providing it to the marketplace.

Ban Ki-moon, Secretary General, United Nations

Global Energy Footprint



The Journey to Net-Zero Energy



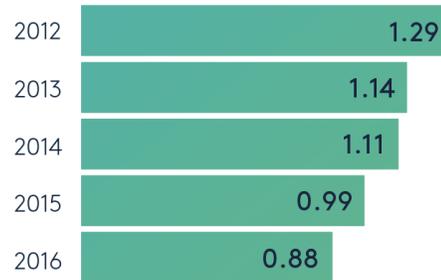
The Journey to Net-Zero Energy

69% in 2017



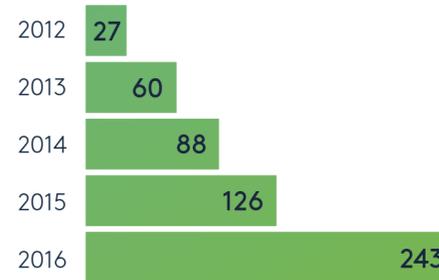
Energy Costs

Light and heat costs as a % of turnover



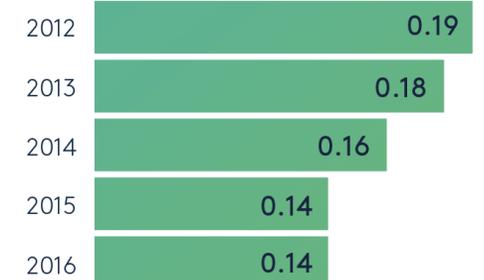
Renewable Energy Usage

Renewable energy used (GWh)



Energy Intensity

kWh per € turnover



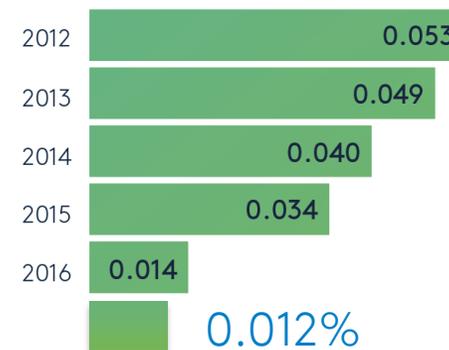
On-site Energy Generation

Renewable energy generated on-site (GWh)



Carbon Intensity

CO₂ tonnes per €m of turnover



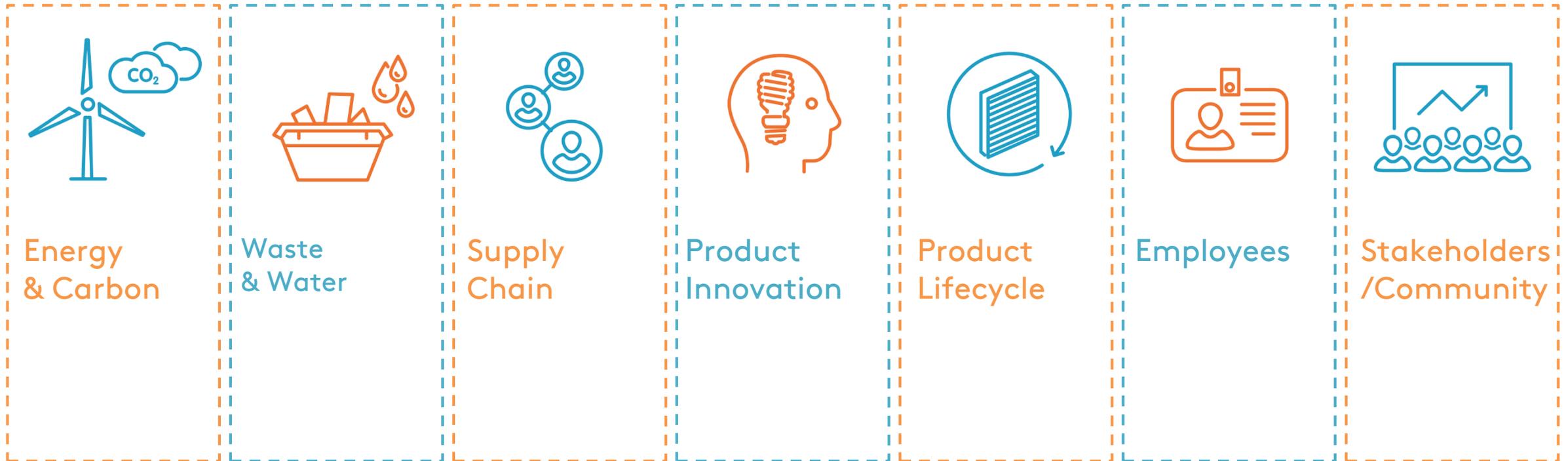
Renewable Electricity Usage

Renewable electricity used (GWh)



“Putting our Energy into Change”

“To be a global leader in sustainable business and establish a leading position in providing ethical, renewable and affordable best practice solutions for the construction sector.”



Reduce

Every Kwh of energy saved no longer needs to be offset or generated from a renewable source.



Understand

Information gathering and knowledge development



Engage

Engagement with industry stakeholders



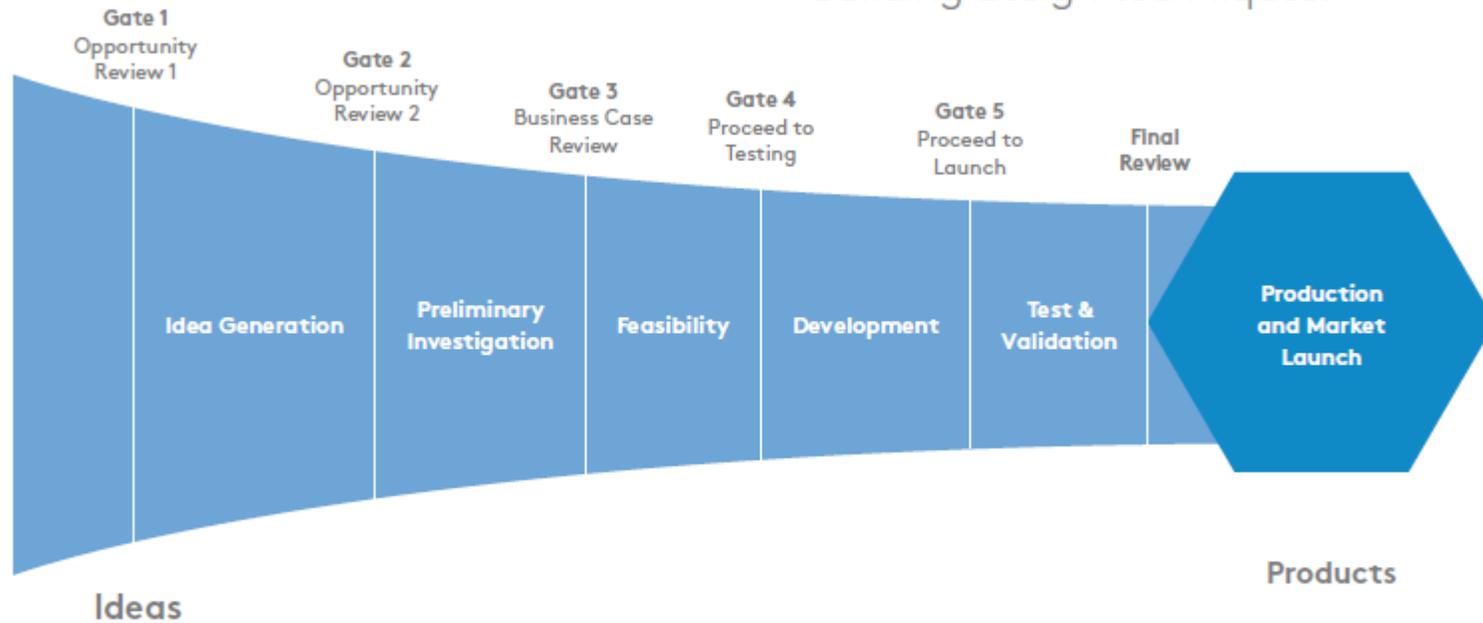
Develop

Our pathway

Sustainable Innovation



In 2015 and 2016, over €44m was invested in Research & Development across the Kingspan Group, supporting our drive towards energy-efficient buildings through innovative technologies, products and whole building design techniques.



Stage Gate Innovation Process



This year, Kingspan Group announced plans for the creation of a Research & Development Centre of Excellence to be located in Kingscourt, Ireland. The facility, currently in the planning stages, will create a central hub for our Research & Development teams across the globe and will be dedicated to next-generation technologies, advanced testing and pilot production facilities.



Innovation

Kingspan®

INNOVATION CENTRE

We know that the built environment has an important part to play in combatting climate change, and we pledge to take the lead. Our commitment to sustainability is instilled at every level of the company and at every step in the manufacturing process.



Net-Zero Energy

Kingspan Solar PV

Embryonic position presently -
Global Scale Opportunity



Kingspan Insulation Boards
Global Leadership - continue to
drive worldwide reach through
greenfield and consolidation



Kingspan Insulated Panels & Façades
Global Leadership -
continue to drive worldwide
reach through greenfield
and consolidation

Kingspan Flatroof Membrane

Embryonic position presently -
Global Scale Opportunity



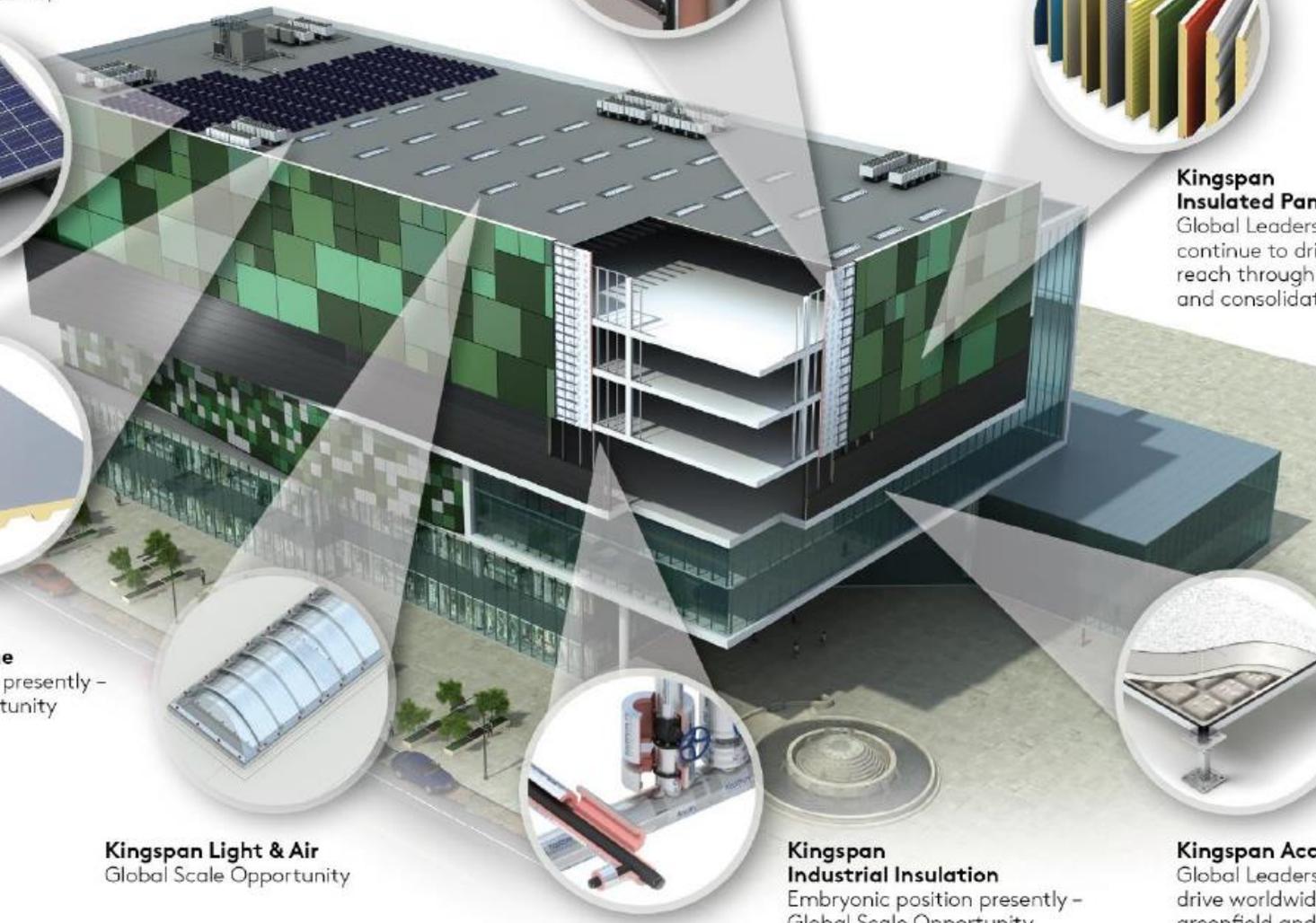
Kingspan Light & Air
Global Scale Opportunity



Kingspan Industrial Insulation
Embryonic position presently -
Global Scale Opportunity



Kingspan Access Floors
Global Leadership - continue to
drive worldwide reach through
greenfield and consolidation



Step 1: Identify an Existing PCR... or Develop a New One

Your product or service will need an appropriate PCR to develop your EPD. As a recognized Program Operator we can help you find an existing PCR, modify an existing one or assist you developing a new one.

Step 2: Conduct a LCA

Based on the PCR requirements, an LCA consultant evaluates the environmental impact of your product or service from raw material acquisition through production, use and end-of-life.

Step 4: Verify the LCA and EPD

Your LCA and EPD must be verified by an independent third-party to confirm that the declared environmental impacts of your product are accurate. We can provide you with a list of approved verifiers that meet the requirements of our EPD Registry and ISO 14025.

Step 5: Register & Publish the EPD with a Program Operator

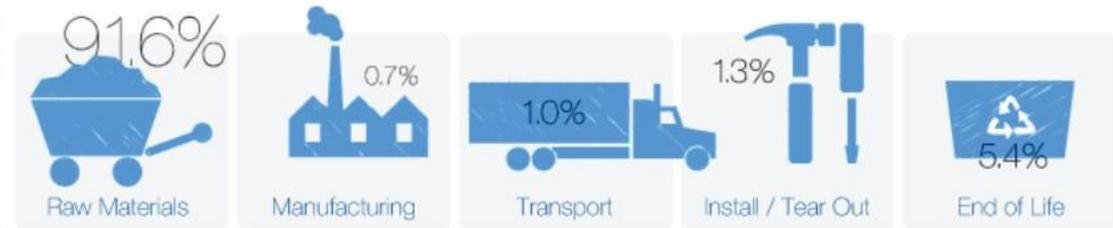
Submit your EPD and we will verify that it meets both ISO 14025 and CSA Group program requirements, and we'll publish your EPD on our registry.

Step 3: Develop the EPD

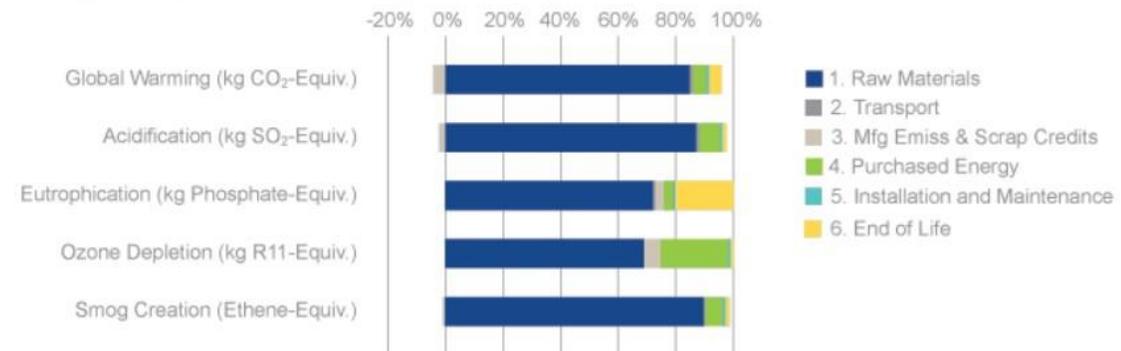
PCR requirements are combined with LCA results to create an EPD that clearly communicates your products' environmental performance. We can provide templates that help you format your EPD for publication and listing on CSA Group's EPD Registry.

Here are the facts

The Life Cycle Assessment – which calculates the environmental footprint of a product at each stage of the supply chain through to end of life – revealed that we are already getting a lot of things right. The majority of our impact comes from raw materials, and we're working consciously with our suppliers to improve this.



Life Cycle Impact Assessment (potential) (per 100 ft² normalized to 100%)



Material Health



Design products that are safe and healthy for humans and the environment from production to use to reuse

Safe ingredients perpetually cycled

CRADLE TO CRADLE
PRODUCTS
INNOVATION
INSTITUTE



SILVER

Carpet XYZ

ISSUED TO: Carpet Company Name

ASSESSED BY: Assessor **EXPIRES:** January X, 2017

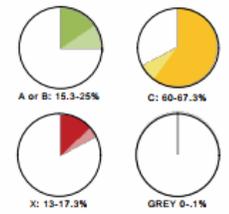
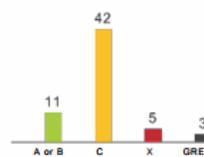
STANDARD: v3.0

ASSESSED SCENARIOS: Manufacture, Installation, Use as insulation, Collection, Recycling

PRODUCTS COVERED: Carpet A, Carpet B, Carpet C

PRODUCT OPTIMIZATION SUMMARY

- Cradle to Cradle Certified™ Banned List compliant**
- Material Health optimization strategy developed**
- No exposure from carcinogens, mutagens, or reproductive toxicants**
- Meets VOC emissions testing requirements
- Product is fully optimized - does not contain any GREY or x-assessed chemicals
- Process chemicals have been identified and none are GREY or x-assessed

PERCENTAGE OF MATERIALS ASSESSED BY WEIGHT	ASSESSMENT RATING BY WEIGHT	PRODUCT OPTIMIZATION
<p style="font-size: 24px; color: #0070C0;">99-100%</p> <p style="font-size: 8px;">Inventory threshold for chemicals in each material = 100 ppm</p>	 <p style="font-size: 8px;">A or B: 15.3-25% C: 60-67.3%</p> <p style="font-size: 8px;">X: 13-17.3% GREY 0-1%</p>	 <p style="font-size: 8px;">81 Materials</p>

SAMPLE CERTIFICATE

CERT NO. MHC2315

More Efficient Performance

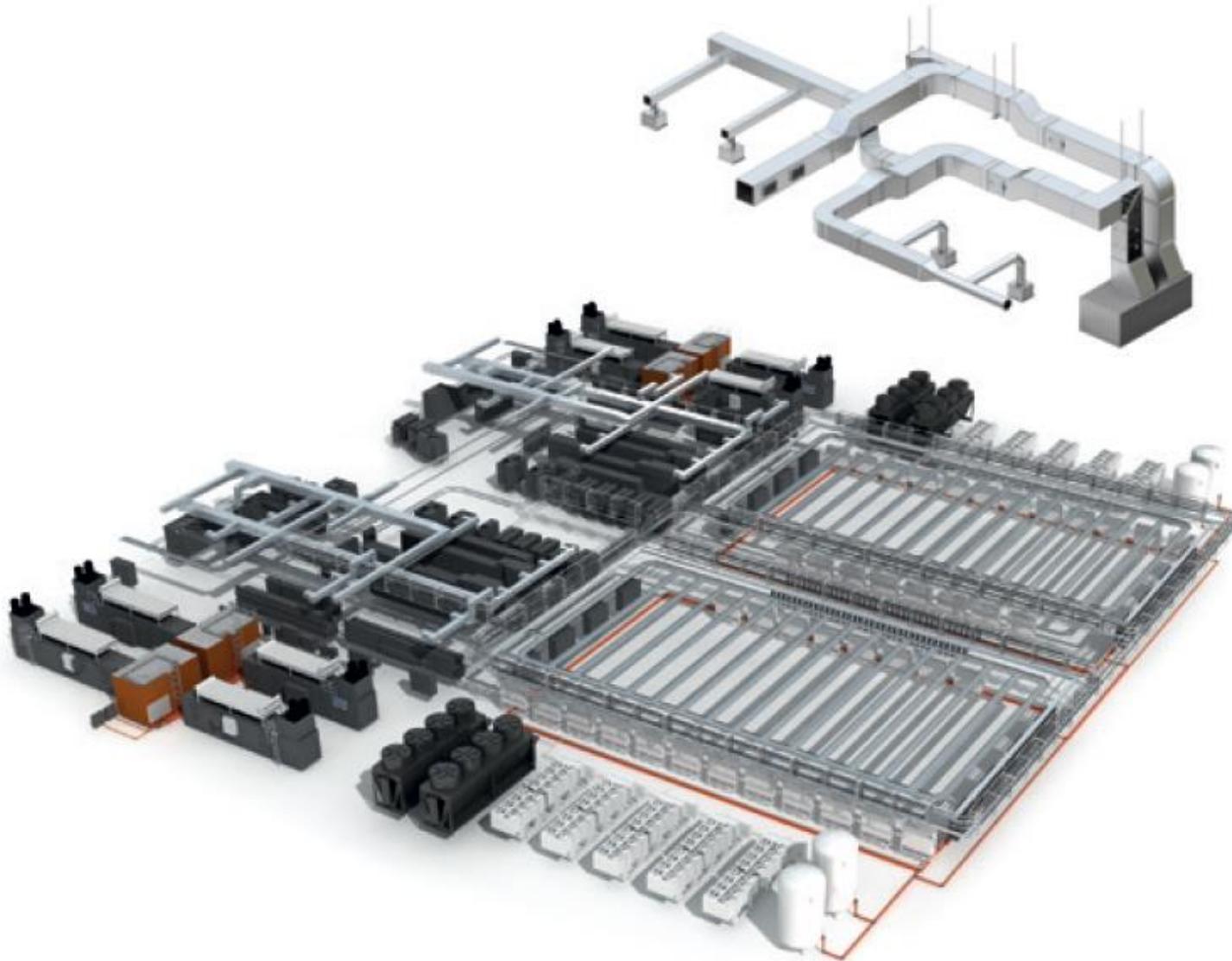
QuadCore delivers a thermal improvement of up to 20% over standard polyurethane insulated panel core insulation.

It has a lambda value of just 0.018W/m.K, the best in the industry, and achieves U-values as low as 0.08W/m²K.

Our manufacturing process behind QuadCore creates cell diameter half that of a typical PUR insulation core without adding extra weight part by an ultra-efficient manufacturing process that reduces waste.



Insulation for HVAC & Pipework

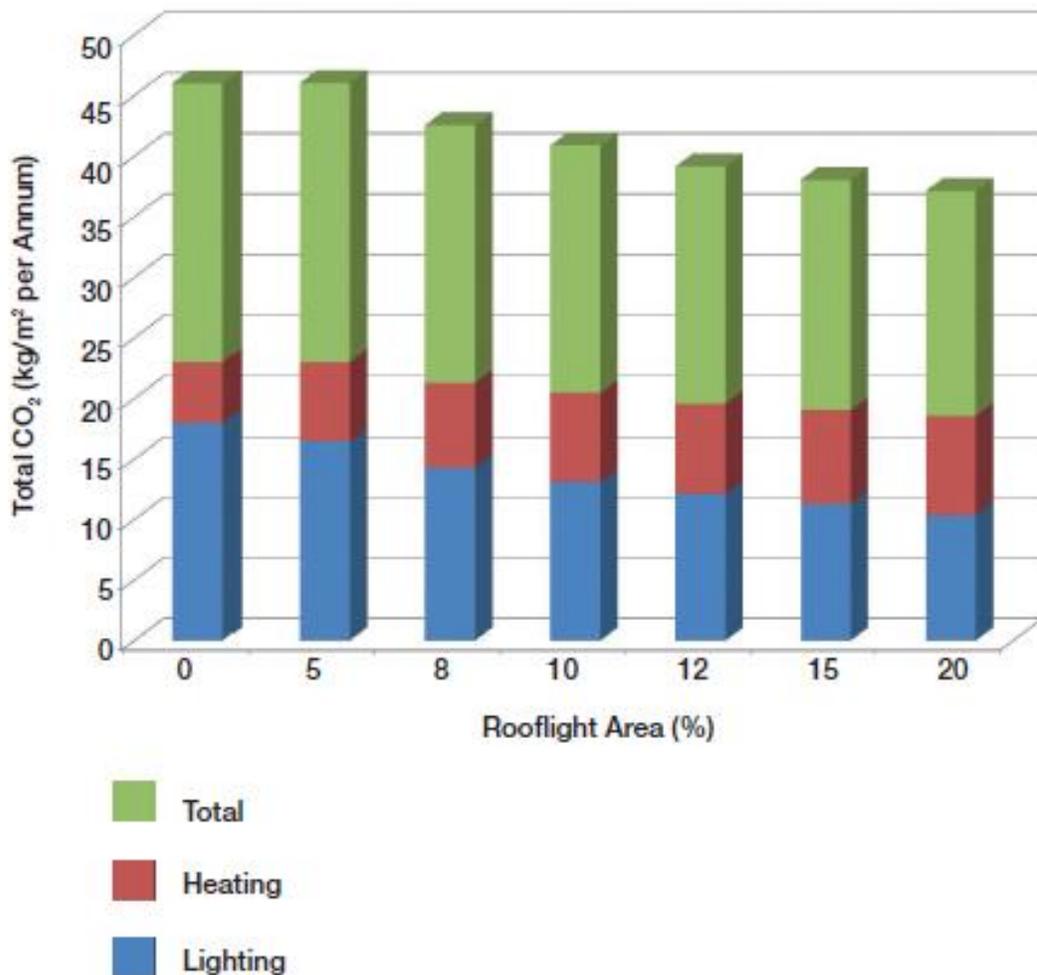


Pre-Insulated
Ducting systems
for FAST, SINGLE-
FIX Installation

Natural Day Lighting



On the path to constructing Net Zero Energy buildings, it is recognized that two of the highest energy consumption areas in a commercial / industrial building are lighting and HVAC.



Reduction in CO₂ Emissions

Research shows that roof lights can provide a projected reduction in CO₂ emissions of around 26%.*

"Using roof lights to provide a bright, naturally-lit interior will save money, provide a more pleasant environment people want to spend time in, increasing productivity



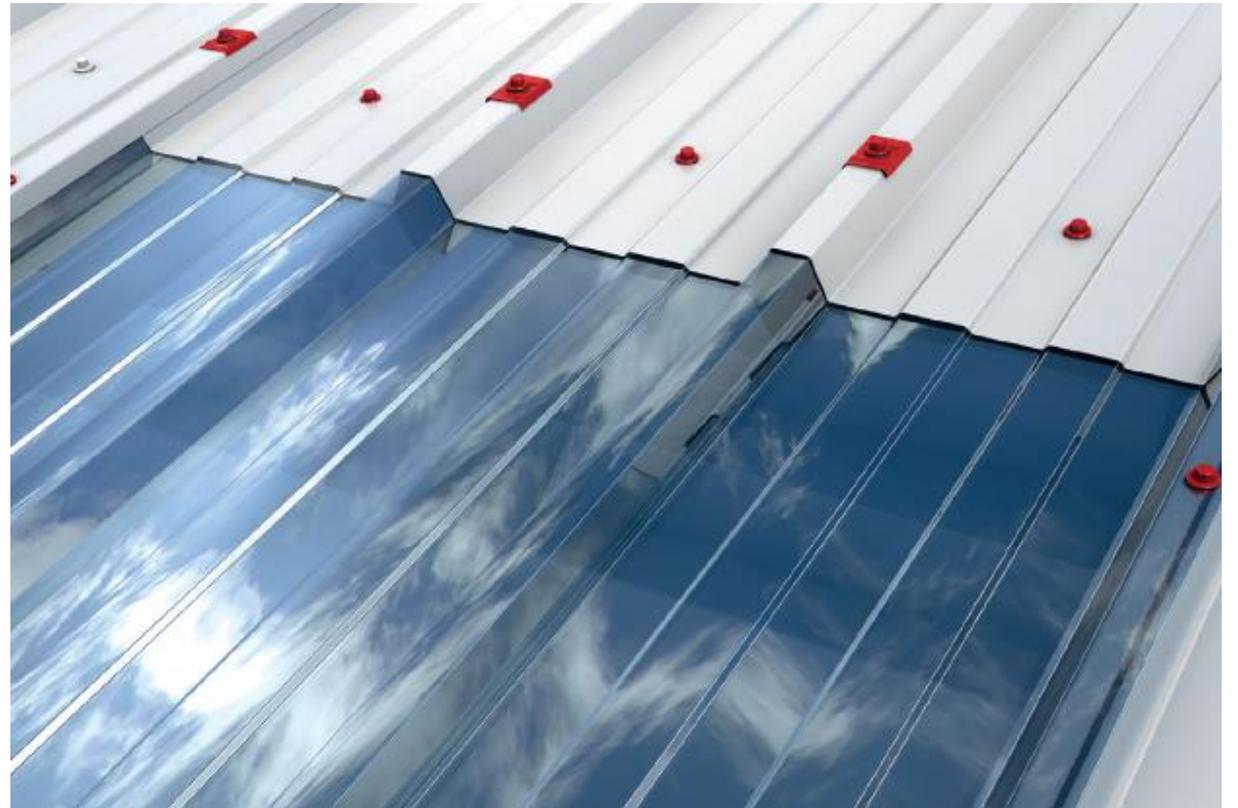
Light Transmission

The longevity of light transmission provided by polycarbonate daylighting systems enables the true benefit of daylight harvesting to be realized. Some other traditional roof light options tend to yellow with age and reduce the benefit over the life of the building.

Natural Day Lighting



The energy needed to light a building artificially is often much greater than the energy used to heat it, and is often the greatest single energy use in operating the building. In conjunction with automatic lighting controls, roof lights can have a major impact on the overall energy consumption of a building.



LED Lighting



A proposal for the replacement of High Intensity Discharge (HID) lighting with Kingspan Smart-Lite High Bay intelligent LED technology at the Kingspan Insulation refurbishment project in Selby.

Existing lighting system comprised 395 HID Sodium (HPS 250W) modules and it was proposed that these be replaced with 294 Kingspan Smart-Lite High Bay (245W, 27klm PIR) modules.

The investment required, including installation = £177,000.

Financial and Energy-Saving Benefits

Payback Period	3.2 years
Annual Electricity Cost Saving (year 1)	£45,831
Lighting Energy Saving (year 1)	91%
Annual Carbon Saving (year 1)	270 tonnes
Return on Investment (over 10 years)	279%
Internal Rate of Return (over 10 years)	50%
Net Financial Position (over 10 years)	£495,108

Kingspan North America NZE Initiative



Our Deland head office in Florida reached **82.6%** Net Zero during 2017 and is currently in the process of a full LED lighting retrofit with a 1.6 MWh Solar PV Proposal planned for 2019

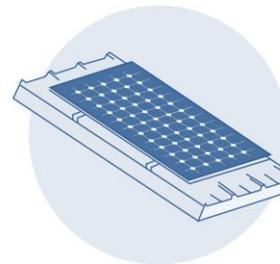


Currently just below **40%** Net Zero during 2017 our Modesto site is expanding its footprint. Planned a 1.5 MWh Solar PV system with onsite energy storage to be completed mid 2019

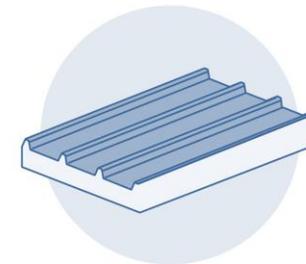
Case Study: Portadown, Ireland



The 1.3MWp installation is set to generate 1.1 GWh of electricity per year, enough to meet 30% of the site's daytime annual energy demand. It consists of 4,844 modules in total, covering 18,000m² of the building's roof.



**1,307.88 KWp
Solar PV system**



**18,000m²
Trapezoidal roof
panels**

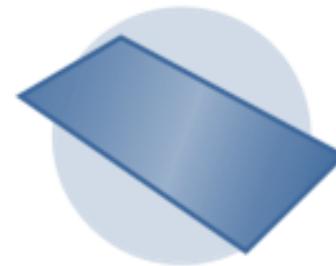


**100% Capital
Financing**

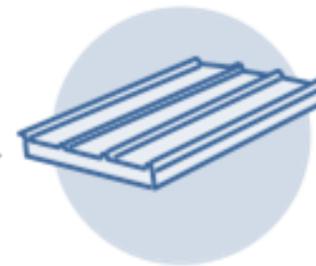


**25 Year
Guarantee**

Case Study: Sherburn, UK



5MWP
of solar PV

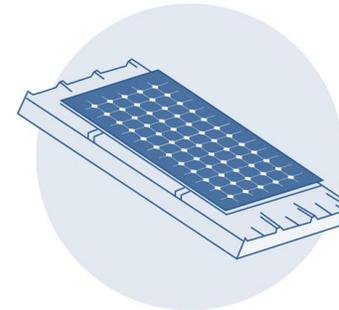


50,000 m²
of Kingspan
Roof Panels



111
Kingspan
Smart-Lite LED
Luminaires

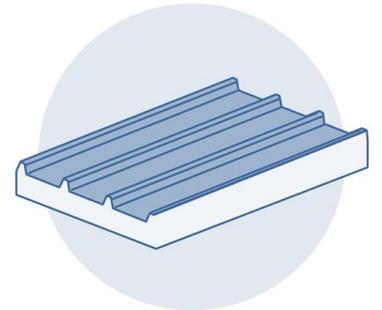
Case Study: Selby, UK



**2.5 MWp
Solar PV system**



**Redesign of the
internal lighting
system**



**30,000m²
Trapezoidal roof
panels**

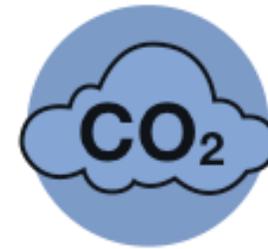
Case Study: Selby LED Lighting



79.2 Gwh
of energy equivalent
to **6,980** homes



£5.2 million



34,895
tonnes of carbon



91%
decrease in
lighting energy
demand

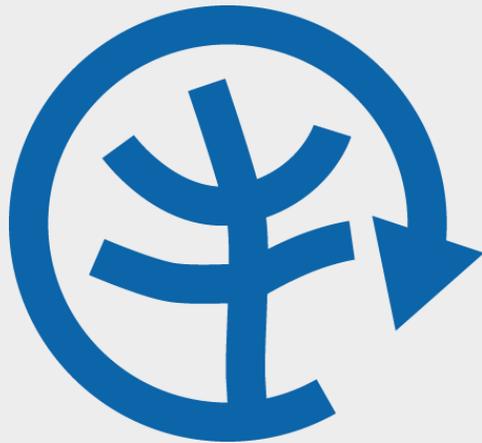
Case Study: Holywell, UK



Its largest manufacturing site at Holywell uses 100% renewable electricity through a 400 kWp Kingspan Rooftop Solar PV system, and the procurement of certified renewable energy.

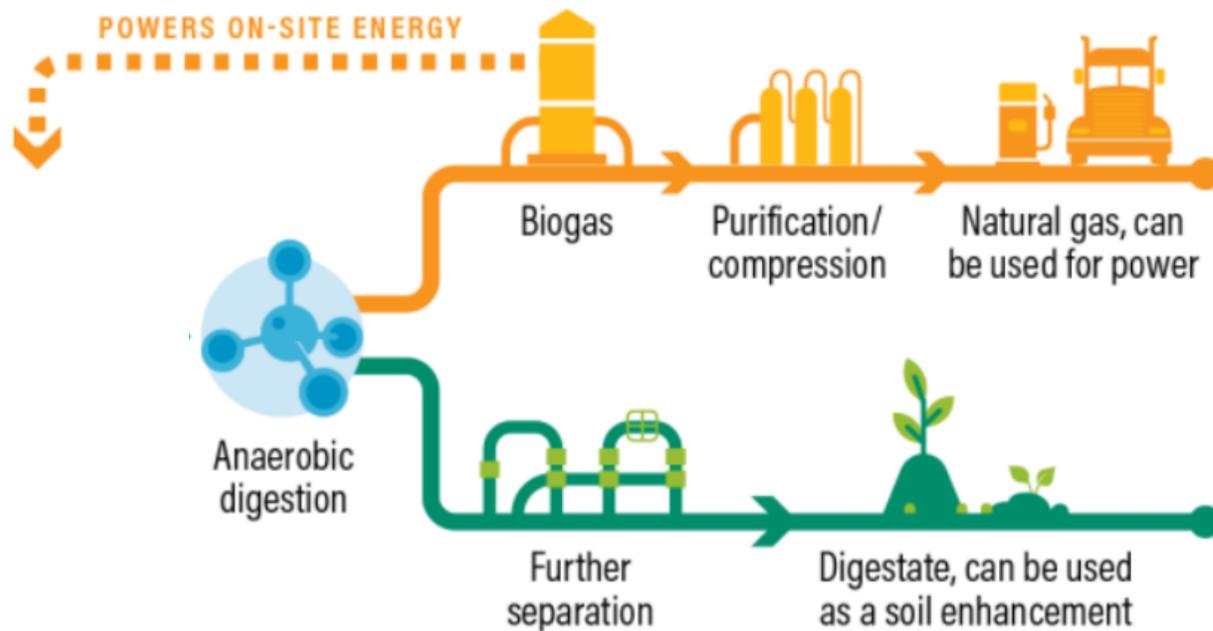
Planning permission has also recently been granted to install a wind turbine on the site. When installed in 2018, it is estimated the turbine will generate 2,374,000 kWh of energy and offset 1,440 tCO₂ - approximately half of the remaining CO₂ on site.

Case Study: Hull



In 2015, Kingspan Access Floors UK replaced the old gas fired heating system in their manufacturing facility in Hull. Three biomass boilers were installed to provide space heating into the factory, using a fuel combination of sawdust waste from production or shredded chips from finished panel offcuts or panels returned from sites at the end of their life cycle. The boilers are predicted to reduce carbon emissions by over **500** tonnes and energy savings will be in the region of **3.5GWh** per annum of gas usage.

Case Study: Pembridge, UK



Currently a local anaerobic digester (AD) plant is exporting both heat and power directly into the largest of the Group's Insulation production facilities in Pembridge, UK.

In 2015 the 500KVA electrical input provided **2.1GWh** in electricity to the site. The AD plant also provided **2.3GWh** of heat energy in the form of hot water which is directed to the two heat recovery systems.

Kingspan Group NZE Initiative

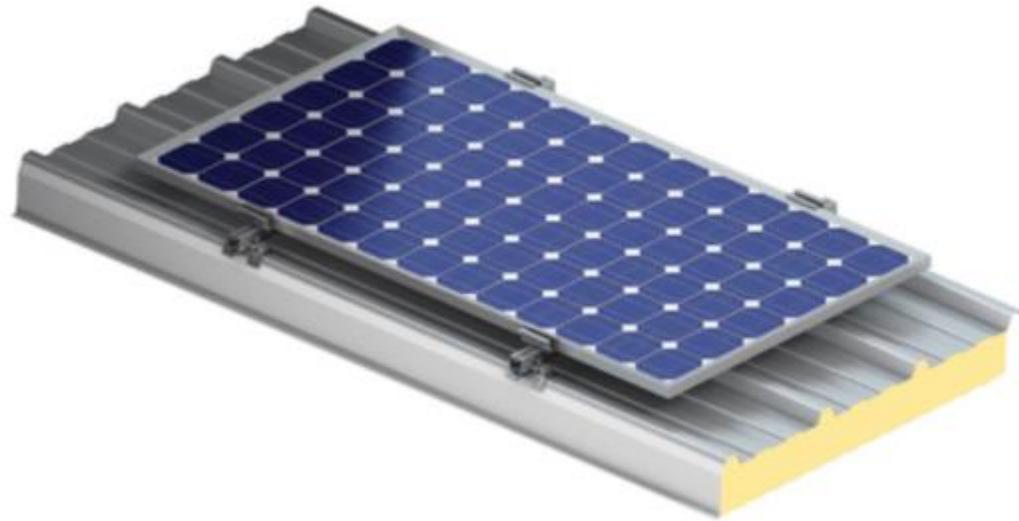


Somerton, AU

It has a 750kW solar system designed into its roof structure which provides most of its daytime shift energy requirements. It also uses Kingspan's energy saving smart lighting system and constructed using Kingspan insulation products throughout to significantly reduce energy requirements and optimize comfort and safety for employees.

Generate

More



Rooftop Solar PV

Module Size: 1.7m x 1m modules | $7\text{m}^2 = 1\text{kWp}$ of power

Module Type: Only Tier 1 modules are supplied

Fixing Detail: Top sheet mounted systems eliminating cold bridging

Application: Suitable for pitched and flat roof applications

Building Types: Can be installed on new build, retrofit and refurbishment projects

Product Compatibility: Structurally tested in conjunction with all Kingspan roof panels

Complete System Design: In-house system inverter design and customised mounting brackets for maximum energy generation

Warranty: 25 year linear output warranty



On Site Wind +Micro Wind



KW3 Wind Turbine

The KW3 wind turbine is the best solution for remote access sites and small domestic properties



KW6 Wind Turbine

The KW6 wind turbine is the best solution for rural domestic, small holdings and agricultural wind turbine applications



KW3EX for offshore environments

The intelligent design of this wind turbine is optimised for harsh offshore environments to make this a market leading offshore wind

On Site Solar Thermal

Solar heating is the natural way to reduce your energy bills and your carbon footprint. It doesn't have to cost the earth...



Solar Evacuated Tube Collectors

Original and the best solar thermal evacuated tube collectors in the world - our Thermomax collectors offer unrivalled transfer of solar energy into usable heat



Solar Flat Plate Panels

Kingspan's solar thermal panels are amongst the most popular flat plate collectors on the market. They provide a cost-effective solution for both domestic and commercial applications, delivering high levels of efficiency

Buy

More

The Renewable Economy



The procurement of renewable energy is a key part of our strategy. We aim to procure fully certified renewable energy as far as possible as the final step to making our sites Net-Zero Energy.

In Europe and North America the market for renewable electricity is well developed with the availability of Guarantees of Origin (GO's) and Renewable Energy Certificates (RECs) in the respective markets.

In other countries we are looking at iRECs and other instruments to help render our electricity renewable.

Green Natural Gas



At the leading edge of innovation, Bullfrog's green natural gas comes from organic waste like apple cores – not fossil fuels. We harness the gas released when the organic matter decomposes, clean it up and put it into the pipeline.

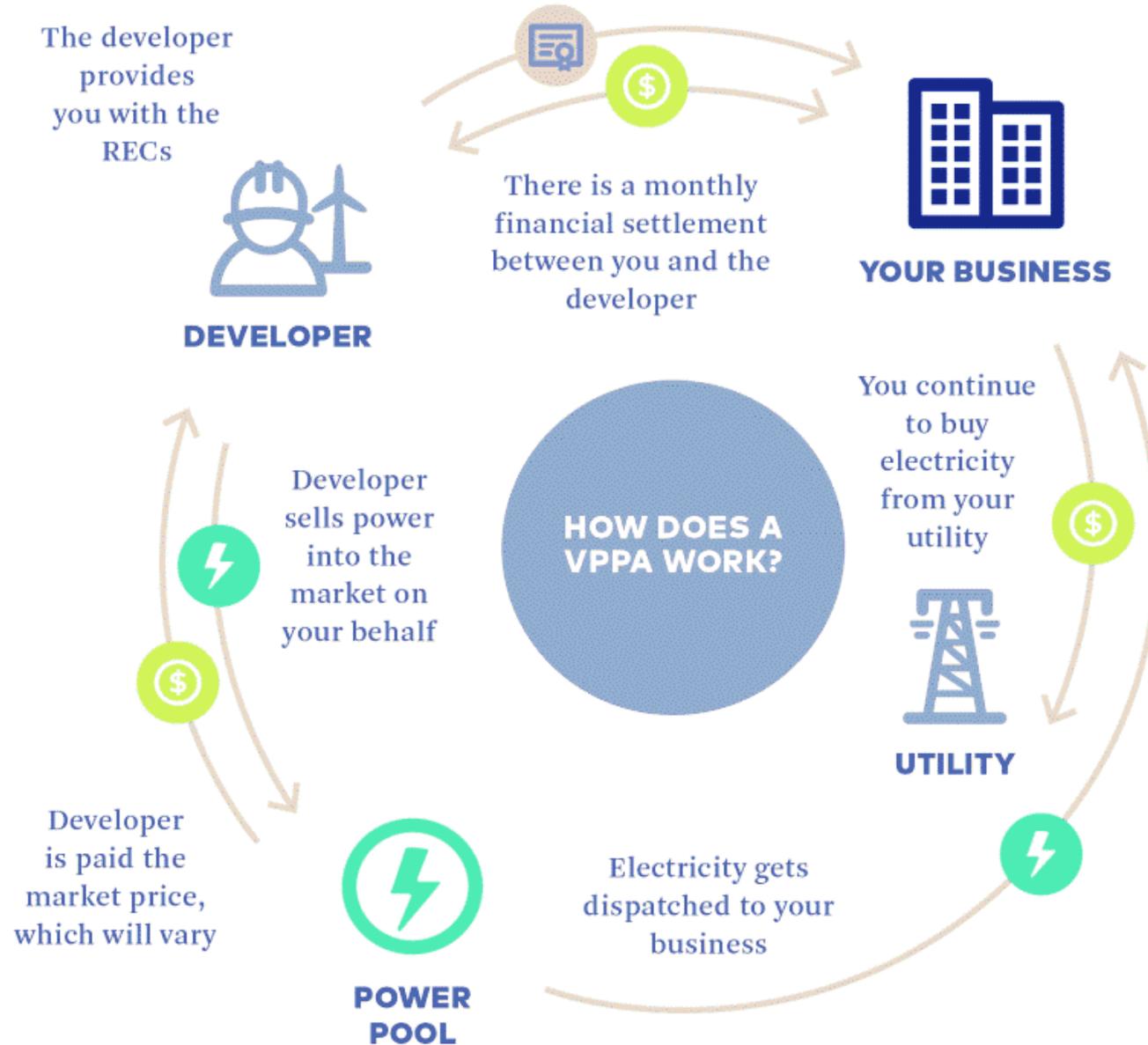
 GREEN NATURAL GAS

2017 = 17 GWh of Natural Gas demand

The Renewable Economy



Virtual PPA's





One size does not fit all.

Frank Zappa

“ quote fancy

What does this mean for our wider stakeholders?



Architects & Designers

Regularly updated and informed of our products and services through literature, presentations, eNewsletters, regular meetings, CPD seminars, focus groups and customer days.



Building Owners & Developers

Regularly updated and informed of our products and services through literature, presentations, eNewsletters, meetings, CPD seminars and focus groups.



Industry Bodies

Founding members of the UK Green Building Council, EuroAce¹ Board member, Chair of EPIC² and member of trade associations.



Communities local to our sites

Local education programmes, contributions to local press, participation in and financial contribution to locally-based charities.



Customers (i.e. Contractors)

Bi-annual customer surveys, regular customer days, focus groups, technical training.

Employees

Employee training, annual staff appraisals, work councils.



Governments/Regulators

Direct contacts with the HSE³, DCLG⁴ and DECC⁵, consultation responses.



Suppliers

Monitoring of top 10 strategic suppliers, approved suppliers list, regular meetings.



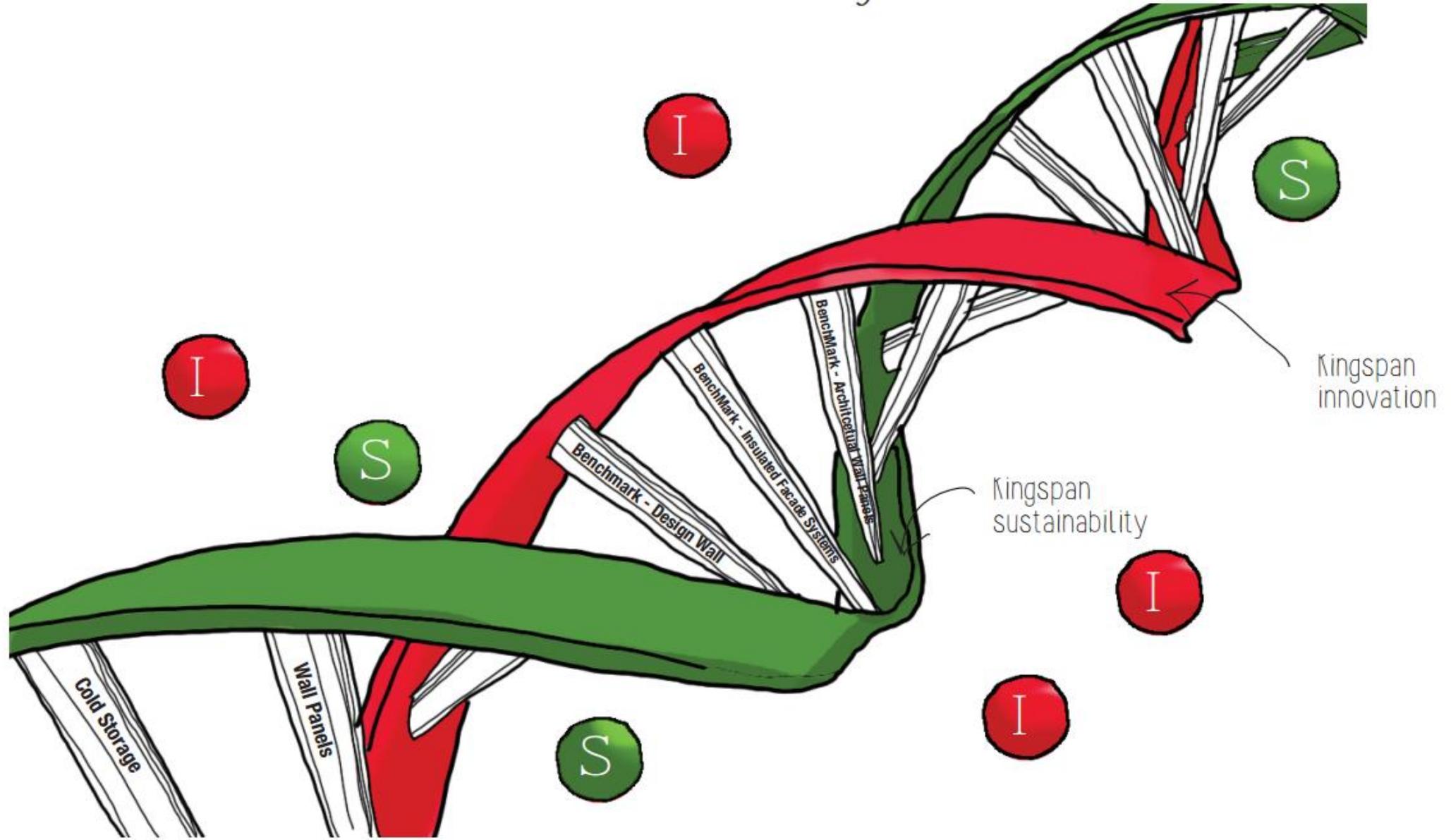
End Users

Keep informed of our products and services through literature, presentations, regular meetings, focus groups.



The Double Helix

Innovation and Sustainability



Continues Improvement



My ask? Put your energy into change

