

# Greener Buildings Success Stories



  
**GREAT**   
BRITAIN & NORTHERN IRELAND





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# Case Studies: Greener Building Design

# Rwanda Institute for Conservation Agriculture – responsibly sourced, low carbon materials

Advanced design and innovation is definitely not restricted to advanced economies. The Rwanda Institute for Conservation Agriculture Institute engaged UK based ARUP to deliver a low carbon facility in which to teach future generations of farmers and agricultural experts. The building uses local materials and resources to create a low carbon and sustainable design. Using low carbon, natural materials sourced within Rwanda has resulted in a building with a much reduced embodied carbon footprint while the ventilation, water and waste systems are all designed to minimise energy consumption from the on-site solar array.

## **Demonstrates UK Skills in:**

Sustainability; Energy performance;  
Materials; Low carbon design;  
Environmental design; Whole life value;  
Responsible sourcing.

Cleaner built assets in Africa



**UNSD Goal 8 Decent Work and Economic Growth**

**UNSD Goal 15 Life on Land**

**UNSD Goal 12 Responsible Consumption and Production**



Cleaner built assets in the UK

# Triton Square, London – integrating architecture, engineering and the circular economy



Designed by ARUP, Triton Square is the exemplar of a new integrated approach to architecture, engineering, and the circular economy. The redevelopment of the 1990s property set ambitious goals for circular economy and carbon reduction with the aim of optimising sustainability, to the extent that the project will save more carbon in design and construction than the building will produce during its 20-year lease. Just one example of this approach involved refurbishing the existing glass from the original building and re-deploying all 3,500m<sup>2</sup> of it into new facades.

**Demonstrates UK Skills in:** Circular economy; Energy performance; Materials; Construction process; Low carbon design; Whole life value; Standards BREEAM and other UK related standards; Innovative procurement models; Responsible sourcing.

**UNSD Goal 12 Responsible Sourcing and Construction**

**UNSD Goal 13 Climate Action**

# Amorepacific HQ, Seoul, South Korea – reduced energy consumption

Home to Korea's largest cosmetics company, the Amorepacific HQ is an exemplar of modern, sustainable, low energy design. The HQ's annual energy consumption is 50% below South Korean benchmarks for commercial offices and stands as a testament to the excellence of UK architecture and engineering expertise from Arup and David Chipperfield Architects. The design brief called for a landmark in low energy and sustainability, which informed the approach to everything from the macro scale and the shape to optimise natural ventilation. Resilience to climate change was also factored into the design so potable water usage and wastewater generation are 52% below baseline. And to cap it all, 22% of the total building materials content, by value, was manufactured using recycled materials.



**Demonstrates UK skills in:** Energy performance; Materials; Low carbon design; Environmental design; Whole life value; Standards BREEAM and other related standards.

**UNSD Goal 7 Affordable Clean Energy**

**UNSD Goal 7 Clean Water and Sanitation**



**Case Study:**

# **Heat Pumps and Networks**





## Leading the move to heat pump technology

Heat pump technology is a leading low-to zero-carbon alternative that draws heat from the ground or air.

Heat pump technology is a leading low-to zero-carbon alternative that draws heat from the ground or outside air – even cold air – to raise the temperature of refrigerant gas, which is passed through a compressor to create a heat source. Heat pumps require electricity for this process, and if the electricity is renewably produced, they create zero carbon emissions.

The UK plan has set a target to install 600,000 heat pumps each year by 2028. The UK government is developing a strategy to drive the growth of heat pump installation with incentives for businesses and households, to create a market-led push to install cleaner, lower-carbon heating sources, especially in properties off the gas grid.

Mitsubishi Electric, a leading Japanese manufacturer, is among those to ramp up its UK operations to meet surging demand for heat pumps. At its factory in Livingstone, Scotland, which employs some 1,200 people, Mitsubishi manufactures up to 2,000 air-source heat pumps each week, which are installed in buildings and homes across the UK and Europe.

The UK is on track to meet an estimated 65% of its demand for heat pumps with domestic production. This reflects the UK Government's ambition to build capacity not just towards UK installations, but also towards manufacturing for exports to France, the Republic of Ireland, the Netherlands, New Zealand and elsewhere.

For more information about how the UK is leading in green innovation, visit: <https://sponsored.bloomberg.com/immersive/the-uk-department-for-international-trade/innovation-is-great/to-build-back-better-means-embracing-green-innovation>

Case Study:

# Plant and Equipment

# On Stratford Waterfront MACE took steps to reduce diesel and carbon emissions on site.

**Example 1:** Replacing diesel excavators with hybrid powered vehicles resulted in a 20% reduction in diesel use, reducing emissions to 1.91Kg from 2.63 Kg/CO<sub>2</sub> per hour.

**Example 2:** Solar powered lighting towers were utilised. This not only reduced CO<sub>2</sub> emissions, but also resulted in noise reduction and reduced maintenance.

**Example 3: CESAR Security System** is an industry security tagging system for plant and equipment which additionally provides emissions data, to allow quick and easy verification of the machine's emissions category.

In support of monitoring ongoing reductions in CO<sub>2</sub> emissions. It is important to tag and register assets providing a whole life usage monitoring.

**H&S:** Avoids the need to look inside the engine bay of plant and equipment, which could pose a risk of injury.

Prior to the introduction of CESAR ECV, to demonstrate compliance with emissions standards, it was necessary to delve into the engine of the machine, find and be able to read and decipher an engine plate comprising a range of alphanumeric codes to determine the emissions standard of the plant.

**Case Study:**

# **Estates and Workplace Planning**

# Home Office Building, London – digital technology helps define the workplace

Building repurposed utilising a digital matrix to capture and analyse the roles and responsibilities and interdependencies within the Home Office to better define the accommodation need.



# **Case Studies:** **Repurposing**

# Net Zero Strategies and Roadmaps for Existing Assets

## Chavecroft will be Raven Housing's first Net Zero development

Raven wanted to develop a strategic plan to retrofit all their housing stock to a net zero carbon standard. They were keen to assess different routes and costs for their range of existing asset base, and to integrate deep retrofits alongside planned investment programmes.

Turner & Townsend provided the following services:

- **Carbon Reduction Options for Housing Managers (CROHM) analysis of current carbon emissions, SAP performance and fuel bills**
- **An investment strategy and outline costs to reach net zero carbon for all existing housing units.**
- **Business case, funding and financing advice.**



“We chose Turner & Townsend because of their technical expertise and the team’s strong experience in working on retrofit in the social housing sector. They helped to us to understand the strategy, costs and technical approaches to improving out stock to meet 2050 climate change targets. They also provided worked case studies for area-based projects to reduce delivery costs over the long-term.”

**Barry Jenkinson, Asset Data & Sustainability.**

# Digital Tools for Repurposing

## Department of Health, 39 Victoria Street, London – Category B fit-out; Building and Information Management (BIM) Level 2

This project entailed a Category B fit out (bespoke and completed fit out) of this 11 story building, and included all fixtures and fittings.

The client awarded the contract to Wilmott Dixon Interiors, who used their in-house design team to provide the solutions. The building comprises a ground floor with large meeting rooms, a restaurant and customer services. The first eight floors consist of open-plan offices and meeting rooms, while the ninth floor features large offices and a bullpen.

The £12.5 million fit-out was delivered as a design and build contract. The client's

requirements were to implement BIM level 2 which provided 3D models for the project thus improving collaboration between client, contractor and stakeholders.

Using BIM and Virtual Reality enabled the project to be delivered on time and to budget.

One of the advantages of BIM applied to this project was the production of visualisations, animations and VR presentations to support the client's understanding of the project. This helped to deliver a successful project better suited to the development and operational needs of the client.

To see more about this project, visit:

<https://www.bimplus.co.uk/projects/wilmott-dixons-inside-job-doh/>





# Standards, Assessment Methodologies and Training to Ensure Sustainable Outcomes

## The Hub, London: BREEAM (Sustainability assessment model) Refurbishment and Fit-out Outstanding

Located at 2 Kingdom Street, Paddington Central, The Hub is the headquarters of Broadgate Estates, a leading property management company.

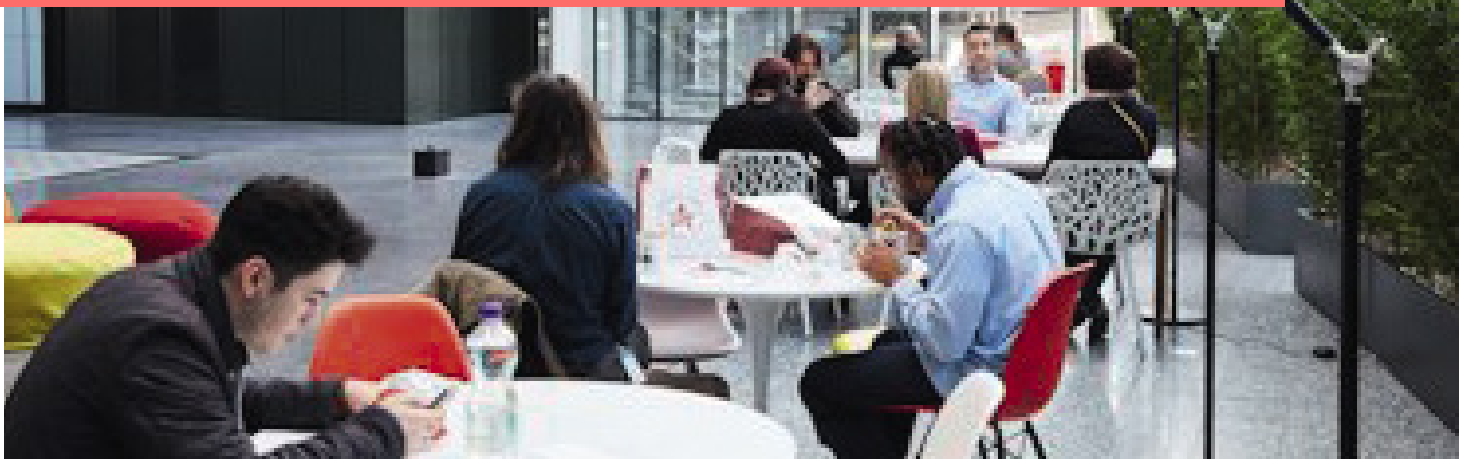
The company needed more space, as different operations needed to come together to help foster collaboration across a national footprint, and the new headquarters needed to showcase the company's capabilities.

Connectivity was a key factor in selecting Paddington Central, with its exceptional position as a focus of travel into London and to the rest of the UK. It also offers proximity to outdoor spaces including Little Venice and Hyde Park.

The Hub is naturally sub-divided into three zones for meeting, working and socialising, which formed the canvas for the company's refurbishment and fit-out plans.

Undergoing BREEAM certification was key to demonstrating Broadgate Estates, sustainability credentials and capability to its clients and employees.

Find out more about this outstanding refurbishment and fit-out project, visit: <https://www.breeam.com/case-studies/offices/the-hub-london/>



# Expert Technical Knowledge of Retrofit Strategies and Models

## Wilmcote House, Portsmouth City Council



Wilmcote House is an 11-storey residential development in Portsmouth. Built in 1968, its original structure comprised of large, poorly insulated concrete panels with pre-cast concrete elements that significantly bridged the thermal envelope, leading to high heat losses, internal condensation risk, mould growth and low internal comfort standards.

With no place to relocate the residents within these 107 units, Portsmouth City Council commissioned ECD Architects to design and deliver a regeneration scheme with residents in occupation.

Due to the size of Wilmcote House, and the number of residents' homes which would have been disrupted, its demolition

would have been complicated and expensive. Retaining the existing building provided an opportunity to improve the estate's image and encourage the longevity of the present community.

The retrofit of Wilmcote House extends the life of the building for a minimum of 30 years, whilst providing a sustainable approach for the estate's regeneration. Attracting ECO funding, the project has been designed to meet the stringent EnerPHit standard, the retrofit equivalent to Passivhaus.

Achievement of this standard will reduce annual heating costs by 90%, saving in excess of £1,000 per dwelling per year in energy bills.

Find out more by visiting:

<https://constructingexcellence.org.uk/wilmcote-house/>

# Net Zero Area-based Programme Delivery/Project Delivery

## Greater London Authority Retrofit Accelerator for Homes

The Retrofit Accelerator for Homes is spearheading innovation and deep retrofit in social housing.

Working with Energiesprong UK and the Carbon Trust, Turner & Townsend, a multinational professional services company, support housing providers to identify, develop, fund, procure and deliver deep retrofit projects.

Working with the GLA, five solution providers and nine social housing providers, Innovation Partnership

procurement was used to aggregate demand, build scale and stimulate a new supply market able to scale up and industrialise a ground-breaking net zero home retrofit solution.

The Innovation Partnership aims to drive innovation throughout the supply chain, foster cost reduction to the point where net zero retrofit is self-financing from the value of income and savings delivered by the retrofit, and therefore be deliverable at scale.

### **Turner & Townsend provide the following services:**

- **Programme management.**
- **Procurement and contracting strategy.**
- **Supply chain and stakeholder engagement.**
- **Funding application development, securing over £26m of investment.**
- **Governance support.**

Making the difference as well as driving ambition and scale into social housing retrofit, the Retrofit Accelerator for Homes Innovation Partnership is set to

deliver performance assured net zero energy retrofit in up to 5,000 homes over three years.



# Case Studies:

# Green Finance

# and UKEF

## Sustainable Development Capital LLP (SDCL) energy efficiency fund

SDCL's investment business is focused on clean energy and energy efficiency project finance. SDCL has established specialist funds in the UK, Ireland, Singapore and New York. SDCL's funds invest in energy efficiency retrofit projects and seek a return based on savings achieved. This generates ongoing operational cost savings and carbon emission reductions as well as improvements to productivity and asset values, in compliance with current and prospective building regulations.

The Sustainable Development Capital Energy Efficiency Income Trust (SEEIT) provides investors with an attractive

total return comprising stable dividend income, capital preservation and the opportunity for capital growth. SEEIT achieves this through investment in a diversified portfolio of Energy Efficiency Projects with high quality, private and public sector counterparties.

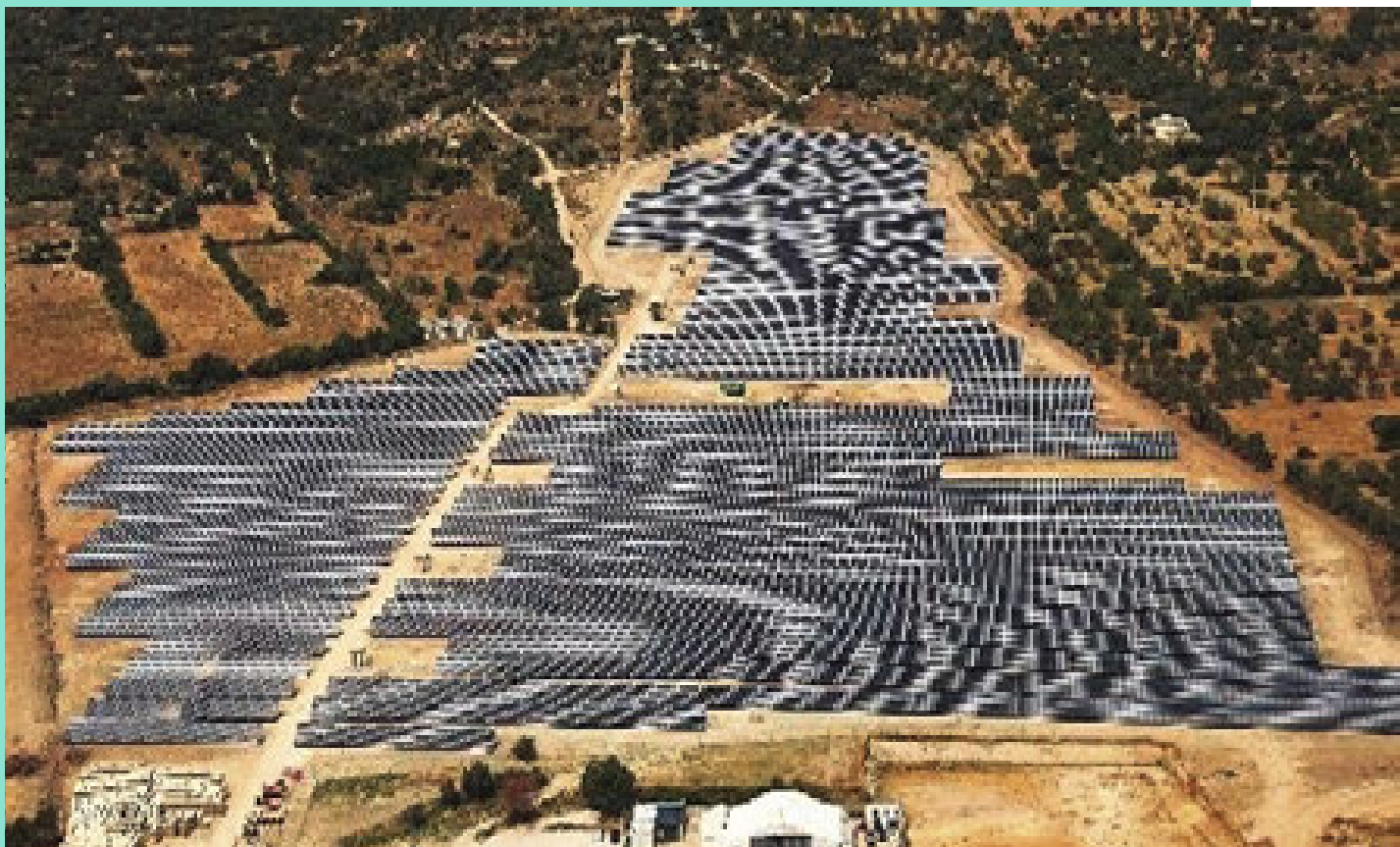
SDCL also invested in Santander Lighting – provision of LED energy efficiency solutions across Santander's UK estate, c.800 buildings and 90,000 lamps for the UK's fourth largest high street bank. Lighting as a service provides a stable, availability-based revenue stream, enabling the finance. This was the largest LED retrofit roll-out in the UK.



## Glennmont – Coruche solar project, Portugal

In 2014, Glennmont acquired the 23 MW Coruche / Seixal solar project in Portugal. The assets were acquired greenfield and all contracts, including turnkey fully wrapped Engineering, Procurement and Construction (EPC) , were structured by Glennmont.

The power is sold under the Portuguese feed-in tariff regime under a 20-year fixed price Power Purchase Agreement (PPA). The Glennmont team also played a key role in the selection of top tier and reputable manufacturers for the modules and the inverter supply.



# UK Export Finance Clean Growth loan for UAE green construction



In 2021, UKEF provided a £31 million clean growth loan to help finish the new headquarters of one of the UAE's leading environmental management firms. Bee'ah's new headquarters is designed by late British architect Dame Zaha Hadid, founder of Zaha Hadid Architects, and will be entirely powered by renewable energy generated from its solar panels and waste-to-energy systems. It will be one of the most sophisticated 'smart offices' in the world.

UKEF's backing for the project sees around one-third of the value of this green contract being delivered by UK companies, including design, engineering and smart office services. The support comes from UKEF's [Clean Growth Direct Lending Facility](#), which dedicates £2 billion of funding for clean growth and renewable energy projects.



#### **Department for International Trade**

The UK's Department for International Trade (DIT) has overall responsibility for promoting UK trade across the world and attracting foreign investment to our economy. We are a specialised government body with responsibility for negotiating international trade policy, supporting business, as well as delivering an outward-looking trade diplomacy strategy.

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