UKRI Innovate UK

Adopt and Accelerate

Net Zero Innovation Adoption

Case Studies

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Introduction

As the race to net zero intensifies, Innovate UK's Adopt & Accelerate programme is dedicated to supporting organisations on their journey to a more sustainable future.

The diffusion of innovation is a key factor in scaling the impact of net-zero solutions, and sharing examples of effective collaboration allows us to learn from what works, adopt best practices and inspire further action across industries and communities.

This resource brings together a collection of the pioneering projects, collaborations and innovators that we have supported and engaged with through our programme's workshops, events and **Net Zero Catalyst Fund Innovation Exchange (iX) competition**.

These partnerships demonstrate the transformative power of collaboration - where innovation, the sharing of expertise, and a commitment to sustainability intersect.

By shining a light on these projects, we hope to inspire and empower others to take action, driving further innovation and collective progress towards a net zero future.

Case studies at a glance

Sectors

- AgriFood Systems
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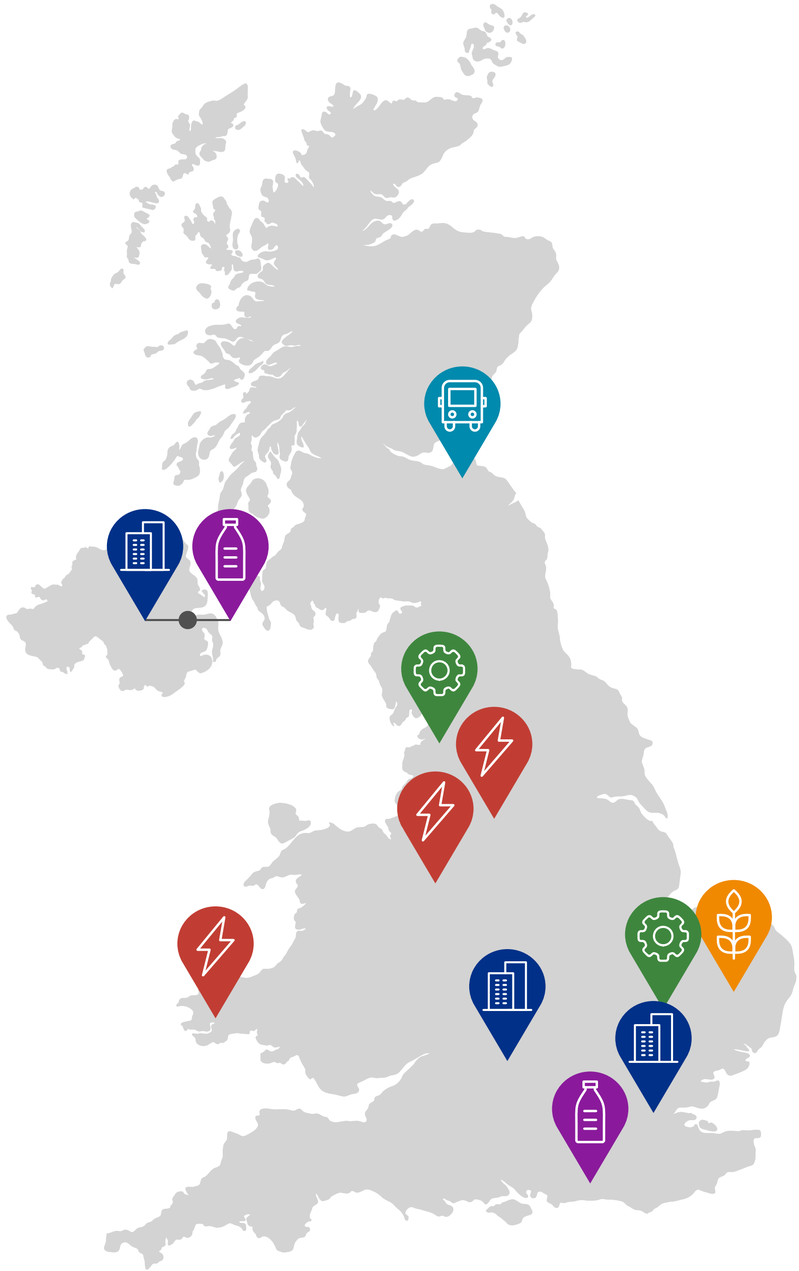


AgriFood Systems

Advancing net zero innovation in produce processing

Location: Suffolk, East of England
Net Zero innovation: Computer vision technology

Frederick Hiam Limited, a family-owned fresh produce business, partnered with Wyma Solutions to implement an innovative net zero technology designed to optimise production efficiency, reduce resource use and support decarbonisation goals.

The project focused on the adoption of Wyma's **Optical Roto-Cut system**, to automate and enhance parsnip trimming accuracy. This collaboration emerged from a shared objective to address labour shortages, improve crop quality and significantly reduce water and energy consumption.

Beyond operational benefits, the partnership enabled Frederick Hiam to double throughput, expand collaboration with Burgess Farms and establish a grower group to optimise the supply chain. These developments are crucial steps toward advancing sustainable innovation and accelerating place-based decarbonisation in the fresh produce industry.

This project underscores the value of collaboration between local businesses and innovators in achieving net zero targets. Frederick Hiam's successful adoption of Wyma's technology demonstrates tangible environmental and economic impacts, inspiring broader adoption of net zero solutions across the sector.

Wyma Solutions Optical Roto-Cut system technology

During the trial phase, the system demonstrated remarkable efficiency gains:

Up to
30%
less water consumption

25%
less energy use

95%
trimming accuracy (improved from 65-70%)

90%
lower manual labour dependency (20 operators reduced to 2)

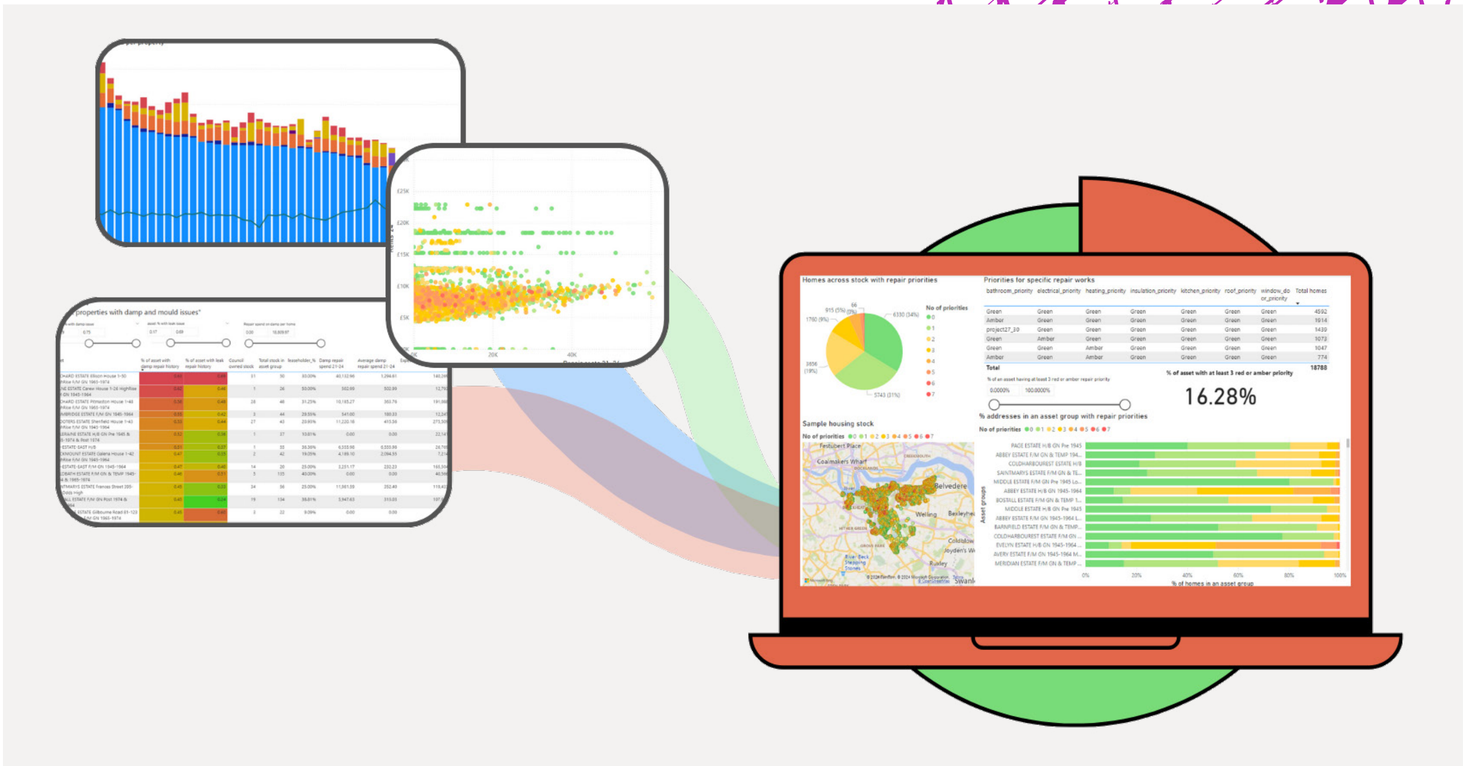
Buildings and Infrastructure

Providing greater insight to prioritise net zero property upgrades

Location: Greenwich, Greater London
Net Zero innovation: Artificial intelligence and data analytics

DG Cities is collaborating with a London council to tackle challenges in managing housing stock through an innovative "home-by-home" plan, using advanced data analysis and artificial intelligence (AI) to prioritise property improvements.

This system addresses both short-term proactive repairs and medium to long-term capital programmes based on need, employing a traffic-light system to classify repairs and upgrades by urgency and create optimised work programmes ready for commissioning.



Actionable data insights on the home-by-home platform

By utilising existing datasets, such as stock condition reports and repair histories, and leveraging AI to analyse unstructured, text-based data like repair descriptions and complaints, the "home-by-home" plan can generate actionable insights.

Housing providers can then optimise resources, minimise disruption to residents and reduce costs by aligning multiple works such as window replacements and energy efficiency upgrades, with year-by-year project mapping further enhancing long-term estate management.

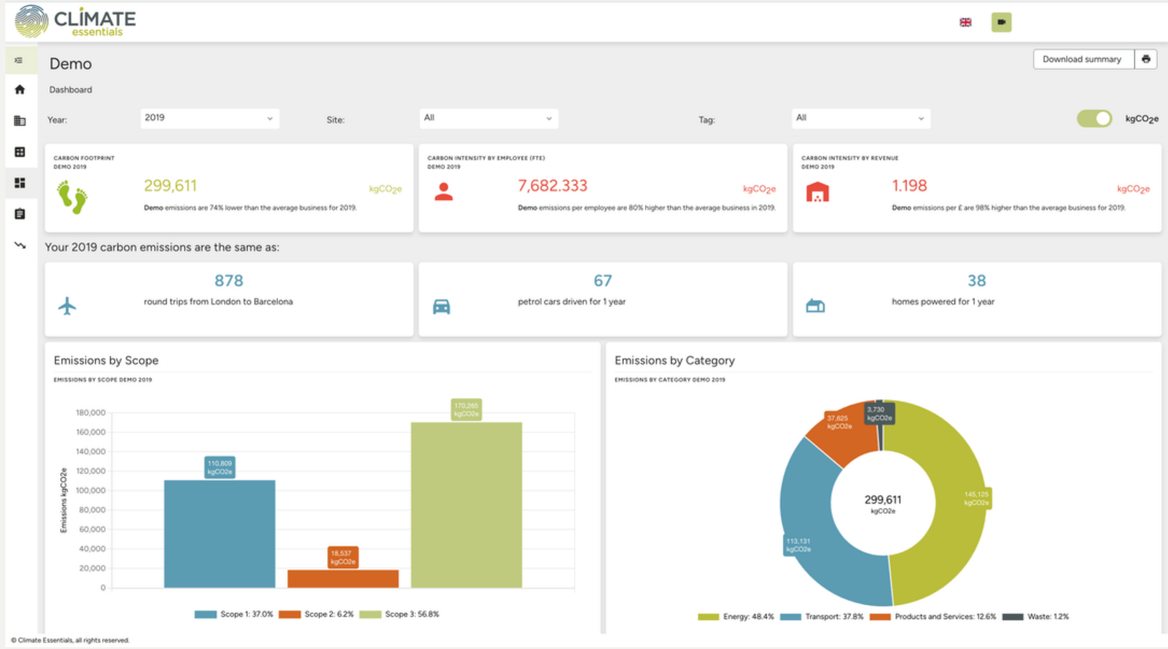
In its pilot phase, this solution offers a scalable framework to help councils meet net zero goals while ensuring safe, comfortable, affordable homes. The next steps include scaling the project and integrating ongoing monitoring, such as IoT sensors, to ensure long-term success.

Making properties more efficient through carbon management

Location: Belfast, Northern Ireland
Net Zero innovation: Carbon measurement platform

CBRE NI, a Northern Ireland-based real estate company, has partnered with Climate Essentials to enhance operation efficiency and sustainability across its commercial properties through the adoption of Climate Essentials' carbon management platform.

The platform provides real-time insights and reduction plans that have helped CBRE NI measure its carbon footprint annually, from a baseline in 2021. This has allowed them to track reductions and refine their sustainability strategies while reporting on energy, waste, business travel, employee commuting and purchases of products and services.



Climate Essentials platform

A pilot scheme with CBRE was launched in 2024 in a multi-tenanted commercial Belfast property. Tenants were given access to the Climate Essentials platform and empowered to measure, report and reduce operational emissions, allowing CBRE NI to track progress, compare data, identify concerns, pinpoint improvements and support actionable steps towards their net-zero goals.

This collaboration has provided CBRE NI with a deeper understanding of its **scope 1, 2 and 3 emissions** to inform future sustainability initiatives and advance decarbonisation efforts across its portfolio.

The project's objectives were to:

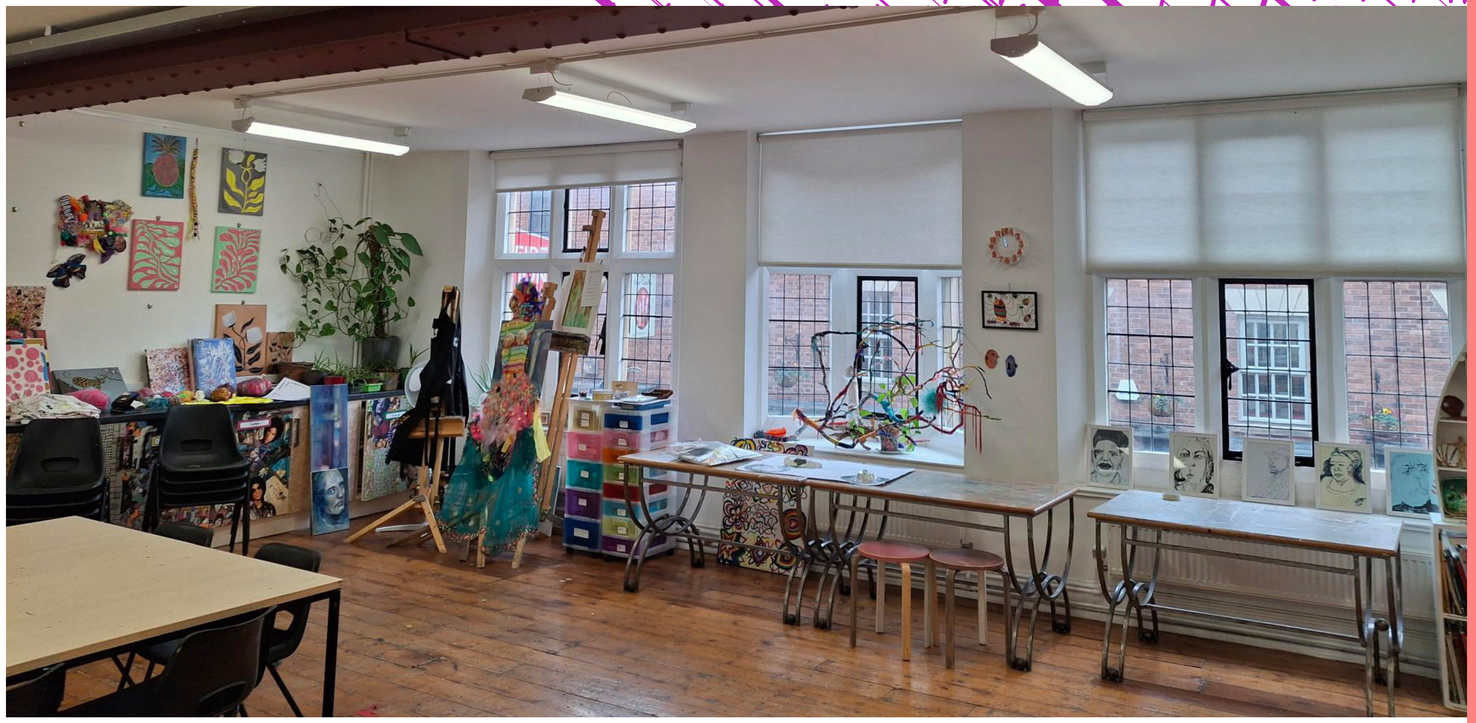
- **Monitor and manage CBRE NI's carbon footprint**
- **Enhance operational efficiency across their managed portfolio**
- **Understand property emissions and minimise their impact**
- **Engage building occupiers in carbon management**

Testing a new system for reducing local carbon emissions

Location: Oxford, Southeast England
Net Zero innovation: Local carbon reduction scheme

The Local Carbon Oxford Project (LCOP) is an Innovate UK-funded collaboration between Oxford City Council and Low Carbon Hub that aims to develop a local carbon reduction scheme to overcome the barrier to funding retrofit for non-domestic organisations.

Unlike carbon offsetting, LCOP focuses on local impact, and it has a business-to-business approach that pairs organisations looking to contribute towards high-trust and high-integrity carbon reduction projects with other local organisations that require funding to implement energy efficiency retrofit measures that will generate carbon reduction.



LED lighting from the LCOP project in the Art Room at Crisis Skylight, Oxford

As a pilot project, its key objective is to establish and test a "minimum viable system" of the processes and procedures needed to operate a retrofit-linked local carbon reduction scheme. The project is working with both organisations who are looking to install energy efficiency retrofit measures, and organisations that would like to contribute funding and are willing to give feedback to shape the LCOP processes.

This will help create an effective, transparent, high-trust and high-integrity carbon reduction scheme. Beyond carbon reduction, LCOP projects also recognise the social value that energy efficiency retrofit projects can bring through a range of co-benefits, such as enhancing local air quality to improve public health.

The project offers the opportunity to develop a mechanism to help Oxford achieve its net zero 2040 carbon target whilst addressing the challenges that small to medium enterprises face on funding retrofit.

Energy

Exploring the potential of offshore wind producing green hydrogen

Location: Pembrokeshire, Southwest Wales
Net Zero innovation: Floating wind technology

The Milford Haven: Hydrogen Kingdom (MH:HK) is a collaboration between Celtic Sea Power (CSP), ERM Dolphyn (ERM), Wales and West Utilities (WWU) and Offshore Renewable Energy Catapult (OREC), which seeks to investigate if offshore wind producing green hydrogen can become more cost-effective than electrically connected projects.

MH:HK will support the development of ERM's technology readiness level (TRL) 7 Dolphyn Hydrogen technology through to TRL 9.

12,000

tonnes of hydrogen estimated to be generated per year from next phase of project

The project's objectives were to:

- **Accelerate the rollout of floating wind and marine energy**
- **Deliver industrial decarbonisation**
- **Support the Celtic Freeport to create over 16,000 new green jobs**
- **Generate £5.5 billion of new investment for the region**

Building on prototype testing developed in 2024, the next phase involves the development of a 10–15 megawatt hydrogen production from a floating wind unit, as well as a 135 megawatt project that will deliver an estimated 12,000 tonnes of hydrogen per year.

This will be processed in CSP's Pembrokeshire Demonstration Zone, with a target to connect to local industrial consumers and the WWU's HyLine Cymru project.

Additionally, the planned 100% hydrogen pipeline will connect Pembrokeshire to industry in Neath Port Talbot, further supporting the region's commitment to embracing hydrogen as a clean energy solution.

The Celtic Freeport has a target of £3.5 billion inward investment from the hydrogen industry, with green hydrogen contributing 10% towards Milford Haven Waterway Future Energy Cluster's target of providing 20% of the UK's 2030 energy production.

The Dolphyn Hydrogen technology unit proposed for deployment

Enabling an electrochemical hydrogen cluster for Greater Manchester

Location: Manchester, Northwest England
Net Zero innovation: Electrochemical hydrogen technology

In 2013, Greater Manchester Combined Authority and Manchester Metropolitan University launched a Greater Manchester Hydrogen Partnership to develop an innovation facility with the resources, expertise, and collaborative ethos of the region to grow a hydrogen ecosystem.

The £4.1 million **Manchester Fuel Cell Innovation Centre (MFCIC)** opened in August 2018 and supports over 150 SMEs and multiple industry partners to develop the next generation of electrochemical hydrogen technologies in association with a policy and skills development unit.

The centre has embedded the triple helix model for innovation – academia, industry and local government – which underpins Greater Manchester's mission to be a world-leading region for supporting higher education institutions, manufacturers and developers of hydrogen technologies, along with their supply chains.

Development of next generation of electrochemical hydrogen technologies at The Manchester Fuel Cell Innovation Centre

The Manchester Fuel Cell Innovation Centre supports hydrogen innovation within a place-based agenda, as demonstrated by its Hydrogen and Fuel Cell Strategy and Vision, approved by Greater Manchester Combined Authority (GMCA).

The MFCIC has also led the development of the Greater Manchester Electrochemical Hydrogen Cluster (GMEHC) using funding from Innovate UK and the GMCA.

This cluster connects hydrogen innovation expertise across the region to support businesses with their R&D, capacity and scale challenges, creating a regional scientific power.

150+
SMEs supported by the MFCIC

Building connections for a fair energy future

Location: Northwest England
Net Zero innovation: Data analytics tool

Centre for Energy Equality partnered with a Northwest-based City Council to support a comprehensive housing retrofit analysis using the Fairer Warmth Data Platform.

This innovative tool integrates advanced data analysis and algorithms to assess the impact and costs of various retrofit measures across the city.

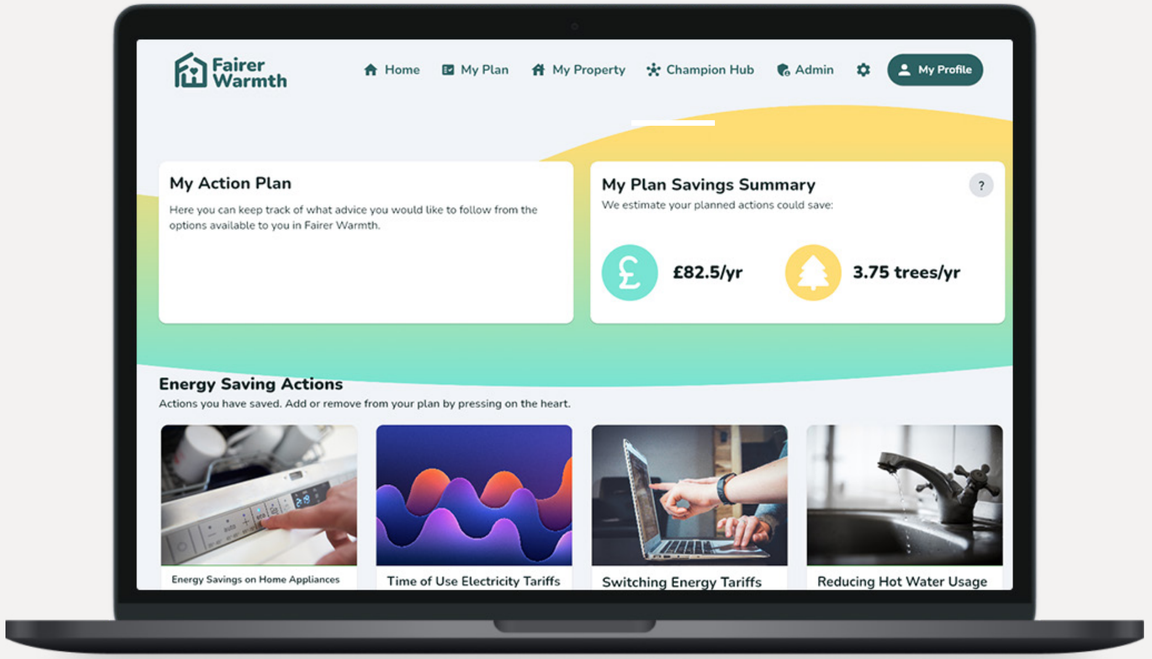
By refining existing models, the Centre for Energy Equality provided detailed insights into energy use and cost implications for different housing types, enabling the Council to prioritise high-impact investments.

This approach also identified areas with retrofit challenges and mapped affordability barriers to ensure equitable implementation of energy efficiency measures.

Looking ahead, the Fairer Warmth App will serve as a central tool to engage residents, guiding them toward appropriate energy transition options tailored to their circumstances. This partnership exemplifies how data-driven solutions and targeted engagement can drive sustainable urban transitions.

The project's deliverables included:

- **Providing detailed analysis of intervention options**
- **Mapping hard-to-treat areas**
- **Providing open access to the Fairer Warmth Data Platform for data insights**



The Fairer Warmth App connects households with organisations to promote a fair energy future for all

Industry

Leveraging AI and robotics to enhance direct air capture technology

Location: Lancashire, Northwest England & Cambridge, East of England
Net Zero innovation: Direct air capture technology

Through Innovate UK's Net Zero Catalyst Fund, Carbonbit Technologies (CBT) and Finano joined forces to enhance CBT's patent pending Direct Air Capture (DAC) technology for industrial-scale deployment, integrating advanced AI, robotics and energy recovery strategies.

This partnership marks a critical milestone on CBT's path to achieving its goal of capturing ~12% of the UK's annual carbon emissions by 2050.

Building on CBT's existing prototype, Finano introduced new air handling and processing approaches while incorporating proven subsystems from other sectors.

carbonbit technologies

The resulting technical roadmap achieves:

- **Increased efficiency, based on energy recovery**
- **Unprecedented multi-level modularity, facilitating low-carbon, autonomous robotic assembly and maintenance**
- **Minimised carbon footprint due to Finano's novel contactless lifecycle management technology**
- **Continuous product improvement by leveraging world-leading applications of AI**

The collaboration successfully elevated the technology pathway from TRL 4/5 to TRL 8, laying a strong foundation for future investment. Upon achieving its 2050 goal, CBT will capture 50million tonnes of carbon dioxide per annum – equivalent to ~45 million airline trips from London to New York – and build the UK's first large-scale DAC plant.

CBT and Finano plan to continue working together to apply the project developments at an industrial scale and deploy them worldwide. By combining CBT's technology with Finano's cutting-edge engineering expertise, this project showcases a scalable and cost-effective path to significant climate impact, bolstering UK leadership in the global transition toward net zero.

Advanced AI enhances the efficiency of CBT's technology

50m
tonnes of carbon dioxide captured per annum

Materials

Driving sustainable fibre innovation for food and bottle packaging

Location: West Sussex, Southeast England
Net Zero innovation: Sustainable pulp

Pulpex collaborated with Nafici Environmental Research (NER) via Innovate UK's Net Zero Catalyst Fund to conduct a study assessing the impact of incorporating commercially available non-wood fibres with Southern Bleached Softwood Kraft (SBSK) fibres on specific product properties.

The study's primary objective was to evaluate key pulp properties when blending Wheat Straw and Miscanthus pulps with SBSK. Pulpex sought to explore these blends as part of their innovation strategy to replace softwood pulp with sustainable alternatives in their bottle manufacturing process.

Up to

30%

of softwood pulp successfully replaced with non-wood pulps

Nafici Environmental Research and Pulpex explore non-wood fibres, reducing reliance on softwood pulp while enhancing sustainability

By utilising local supply chains and advanced recirculation techniques, the project achieves several benefits:

- **CO2 reductions of 361kg per tonne of pulp compared to Eucalyptus-based pulp**
- **Up to 95% less water used**
- **Reduced energy consumption**
- **Fewer chemicals used**

Through the project, NER has developed and patented a sustainable process for pulping agricultural waste fibres, such as Wheat Straw and Miscanthus.

This innovative process significantly reduces environmental impact compared to traditional wood pulping methods. The resulting unbleached pulp is versatile and can be used for producing paper, packaging and moulded products.

The findings demonstrated that 25 to 30% of the softwood pulp could successfully be replaced with non-wood pulps without compromising quality.

This advancement represents a significant step in Pulpex's journey to integrate agricultural waste-based fibres into their operations, reducing reliance on traditional wood pulp and supporting their commitment to sustainability.

Revolutionising sustainable packaging through AI-driven optimisation

Location: Belfast, Northern Ireland
Net Zero innovation: Artificial intelligence and data analytics

Led by Blow Moulding Technologies, this project aims to revolutionise plastic packaging design by leveraging advanced computational tools to optimise material efficiency, sustainability, and performance.

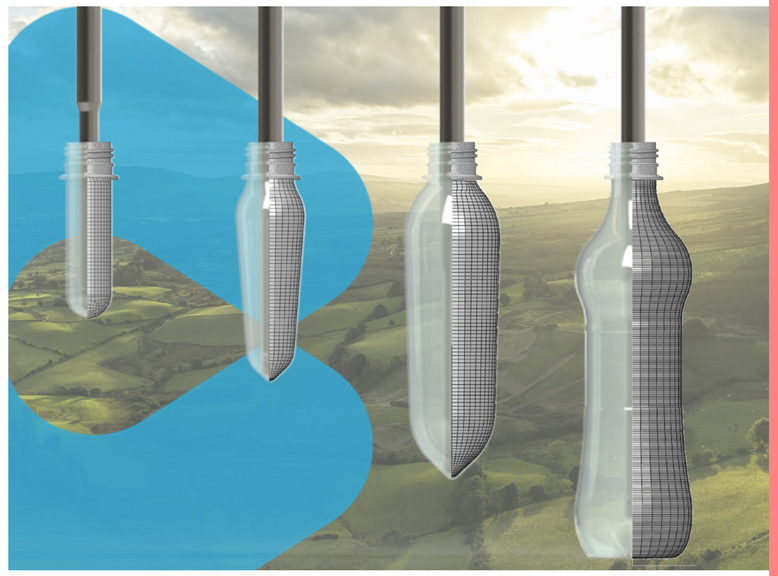
The project incorporates cutting-edge AI-driven simulation technology to predict and improve bottle performance, including top load strength and burst resistance and focuses on the stretch blow moulding (SBM) process, the predominant method for manufacturing PET bottles.

The approach has been adopted by leading plastic bottle manufacturers and brand owners who have successfully developed and validated mathematical models for emerging materials and critical process parameters.

By providing the industry with innovative tools, this project is accelerating the transition to net zero, setting new standards for sustainable plastic packaging design and ensuring greater adoption of bioplastics – directly supporting The UK Plastics Pact.

Key objectives include:

- Developing an automated simulation design tool to minimise material use while ensuring optimal bottle performance
- Enhancing sustainability by integrating recycled polyethylene terephthalate PET (rPET) and bio-based materials into packaging solutions
- Reducing production costs and waste by replacing traditional trial-and-error approaches with data-driven optimisation



Nafici Environmental Research and Pulpex explore non-wood fibres, reducing reliance on softwood pulp while enancing sustainability

Early trials have demonstrated:

Cost savings of
£2m
per client annually

10%
reduction in plastic usage in bottles

50%
increase in recycled PET usage

Transport

Sharing pool cars with the public as a car club in East Lothian

Location: East Lothian, Scotland
Net Zero innovation: Electric vehicles (EVs)

Hiyacar provides a managed electric vehicle pool car service for East Lothian Council, allowing the vehicles to be shared with the public on evenings, weekends, and public holidays.

The project aims to reduce expenditure and CO2 emissions of grey fleet vehicles (privately owned vehicles used for business purposes) while providing the public with access to zero-emission transport, with the Council receiving 100% of public rental revenues.

Using grey fleet mileage claim data and the availability of charging infrastructure, East Lothian Council has identified five optimal locations to host Hiyacar vehicles to ensure maximum accessibility for employees and the wider community.

HiyaCar electric vehicle

Hiyacar collaborated with the Council to market the service, which included creating tailored promotional materials, running awareness campaigns across local channels and holding community engagement events highlighting the benefits of using the car club.

Hiyacar provided training sessions for council staff to help them use the vehicles efficiently, supporting the transition from using private vehicles for business travel. This collaboration has reduced reliance on grey fleet vehicles, decreased CO2 and provided an innovative, flexible transportation solution for both council employees and local residents.

100%

of public rental revenues received by East Lothian Council

Further support

The Innovate UK system is an ecosystem of expertise, funding and powerful connections. Learn more about how we can each uniquely help you achieve your net zero innovation goals by visiting us at:

Innovate UK

Innovate UK Business Connect

Innovate UK Business Growth

If you're interested in connecting with any of the organisations mentioned in this resource, please get in touch with the Innovate UK Business Connect Net Zero team **here**.

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