

SCOTLAND BEYOND NET ZERO

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Seed Fund 2025-26 Impact Report

October 2026

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FOREWORD

Scotland Beyond Net Zero has supported a transformative collection of research projects united by a common goal: advancing Scotland's journey toward net zero and a just transition. These initiatives are a testament to the power of collaboration and co-creation across our research collaboration, driven by the combined efforts of universities, industry partners, and communities.

The research projects in this report address critical challenges on Scotland's pathway to a just transition to net zero through innovative technologies and interdisciplinary approaches. The breadth of research highlights the creative solutions emerging from collaborative efforts.

From enhancing offshore wind development with machine learning, to harmonising solar energy with heritage conservation, to community-driven projects which empower households in fuel poverty with greater energy flexibility, the research demonstrates an interdisciplinary and collaborative approach to energy challenges. The transformation of whisky waste into sustainable packaging and the creation of digital marketplaces for construction materials exemplify the circular economy in action. Peatland restoration is a key focus of this year's projects, showcasing the strength of our researchers in novel restoration techniques, and the best ways of calculating the impact of peatland restoration efforts.

These initiatives demonstrate the strength of partnerships across academic institutions. By pooling expertise and resources, Scottish universities are not only advancing research and innovation, but also fostering an environment where research is co-created with Scottish communities, businesses and governments. This collective approach is vital in tackling the complex challenges of climate change, ensuring that the approaches we develop are both effective and inclusive. By working together, we are paving the way for a sustainable future, where collaboration underpins high-impact research and innovation.

Professor Nicholas Forsyth
Provost, University of Aberdeen
Chair of the SBNZ Seed Fund Panel, 2024-2026



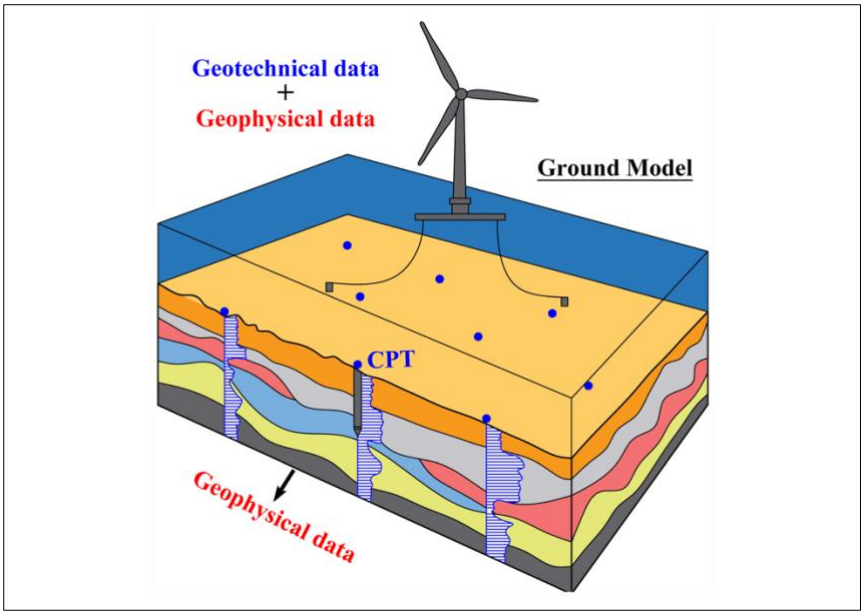
PROJECTS FUNDED 2025-2026

Energy, heat and built environment

GEO-ML: Using machine learning in offshore wind

The challenge: Investigating the seabed to find suitable sites for offshore wind development is expensive and time consuming. Current methods rely heavily on testing individual locations, which cannot always take place due to a lack of vessels and laboratories. Geophysical surveys cover larger areas, but uncertainty in interpreting their data limits their use in engineering design. The research challenge was to combine these two sources of information using machine learning to provide reliable seabed assessments, reduce reliance on costly testing, and support offshore wind deployment at the pace needed for Scotland's 2045 net zero target.

The project: This collaboration between the University of Aberdeen (Dr Bartosz Kurjanski and Dr Iraklis Giannakis), the University of Dundee (Dr Pengpeng He and Dr Hanhe Lin), Seaway7 (Dr Nawras Hamdan) and the British Geolological Survey (Marcus Dobbs) used machine learning to predict good sites from real data, and used real data to refine the quality of the predictions. This provided a method for finding good sites for offshore wind without detailed site inspections.



The figure illustrates how offshore geotechnical data can be intelligently integrated with offshore geophysical data to develop a more reliable ground model of seabed conditions. Geotechnical data provides information at specific locations, while geophysical surveys provide broader spatial coverage of subsurface layers. Combining these datasets improves understanding of seabed variability, reduces uncertainty, and supports a more efficient and cost-effective assessment of ground conditions for the rapid development and design of offshore wind turbines.

How the fund helped:

- *New expertise:* The project strengthened the team's expertise in machine learning and how to apply it to offshore site exploration. These skills are now informing ongoing research and expanding the methods the team can use in future projects.
- *Industry and government application:* The findings will benefit offshore wind developers, geotechnical and geophysical consultancies, and contractors responsible for designing and installing turbine foundations and anchors. It will help them make better use of seabed survey data, save money by only targeting costly geotechnical testing where it is most needed, and help reduce uncertainty in design. Government agencies and seabed leasing bodies will also benefit from more efficient offshore site assessment. Ultimately, the research can support faster, more cost-effective offshore wind deployment and contribute to Scotland's 2045 net zero target.
- *New international collaborations:* The project established new international connections with researchers in Türkiye and Norway, creating opportunities for further research collaboration.
- *Career development:* The project provided valuable experience in interdisciplinary research and industry collaboration to early career researchers.

Next steps: The work is currently forming the basis of a larger research programme and supporting the development of a European Research Council (ERC) funding proposal. The project team have submitted the results to an academic journal for publication.

HI-SCOT: Heritage meets Innovation

The challenge: Scotland faces challenges in decarbonising its buildings while protecting the major architectural and cultural significance of its historic environment. Conventional solar panels can be visually intrusive or difficult to install on heritage and listed buildings. While modern alternatives exist, designers, owners and public bodies are unsure which building-integrated photovoltaic (PV) products can meet energy, structural, aesthetic, conservation and regulatory requirements. HI-SCOT addresses this gap for heritage buildings in Aberdeen, Edinburgh and Glasgow.

The project: Dr Nazmi Sellami, Dr Firdaus Muhammad-Sukki, Dr Samuel Awuku and Dr Mohammed Abdulhameed from Edinburgh Napier University, and Professor Nadimul Faisal and Dr Mohamed Egiza from Robert Gordon University worked with the University of Glasgow Estates and Commercial Services team, and business partners including Meshcanics, Mitrex and ML System. The project also included international researchers including Prof Amar Bennadji,

Hanze University of Applied Sciences in Groningen, The Netherlands & Prof Hatem Mahmoud, Egypt-Japan University of Science and Technology (E-JUST). The research combined technical work to show how different kinds of solar panels can be integrated into historic buildings, with engagement with users of heritage buildings and for professionals, established engagement with conservation, estates, community and industry stakeholders, and planned workshops and a webinar to test the proposed approaches and share learning. The research team held an online seminar, available to view here. You can also read more on a blog post, available here.



Image shows Merchiston Tower, Edinburgh Napier University with a visualisation of building-integrated photovoltaics (BIPV), illustrating how solar technology could be incorporated while matching the texture and appearance of each building's existing roof. Image credit: Project team.

How the fund helped:

- *New scientific insights:* The project assessed a range of emerging PV materials and commercial products for heritage applications, selected facade, tile and glass options for Scottish case studies, completed initial customised-panel designs, and developed a model to demonstrate possible integration.
- *Stronger routes to application*: Engagement with Mitrex, ML System, Polysolar, Ankara Solar and Meshcanics has connected academic analysis to available products, manufacturing considerations and realistic visualisation.
- *Co-creation between estates teams and policymakers:* The team engaged the University of Glasgow on a heritage-building case study. Dr Firdaus Muhammad-Sukki also contributed evidence on heritage constraints, storage and embodied carbon to a

Scottish Parliament workshop scrutinising the draft Climate Change Plan, helping connect the project's subject matter to policy discussion.

- *Career development:* Two research assistants have gained interdisciplinary experience in BIPV materials, design, visualisation and stakeholder research. Two MSc projects, a fifth-year MEng group project and undergraduate honours project now extend the work into PV appearance, power optimisation, structural requirements and PVsyst simulation
- *New networks and dissemination:* The project has built links across conservation, estates, community, manufacturing and academic networks. It has also generated a project website and LinkedIn presence, visual identity and engagement materials, two invited presentations, and an extensive review paper submitted (A Review of Heritage-Compatible Metasurface Photovoltaics for Sustainable Building Integration under Harsh Climatic Conditions, journal - Renewable and Sustainable Energy Reviews).

Next steps: The team will complete the user and professional surveys, analyse the findings and report the results. It will finalise the model, receive and assemble the selected PV materials, and use product data and modelling to assess power output and integration options for case-study heritage buildings. The evidence will be used to recommend combinations of PV technologies that reflect regulatory and architectural constraints. Knowledge exchange will continue through a community workshop. The team will deepen collaboration with Historic Environment Scotland, CeeD, the University of Glasgow, industry suppliers and new academic partners, and explore joint follow-on proposals on smart energy integration for heritage buildings, and apply for further funding opportunities.

CARE: Community-led affordable and clean household energy

The challenge: The UK's move to net zero relies on increasing flexibility in its electricity system to enable greater use of renewable resources. Dynamic pricing, which changes electricity costs throughout the day, helps households adjust their usage to market conditions. The UK Government, Ofgem, and the National Energy System Operator released the Clean Flexibility Roadmap on 23 July 2025, emphasising consumer-led flexibility. This approach aims to optimise electricity infrastructure use, lower system costs, and give consumers more control.

However, the participation of households in fuel poverty in this flexible market is not well understood. Current systems often cater to those who can afford technologies like electric vehicles and smart systems, which require financial and digital capabilities to manage complex tariffs. Households in fuel poverty may have less flexibility due to restricted energy use and unchangeable routines due to work or health needs. The CARE project aimed to address this

research gap by exploring how dynamic tariffs could benefit households in fuel poverty, and highlight possible downsides such as increased complexity and financial uncertainty.

The project: The CARE project sought to better represent the reality of fuel-poor households in research and policy. The project saw a collaboration between researchers at the University of Glasgow (Prof. David Flynn, Dr Benoit Couraud, Dr Merlinda Andoni and Dr Sonam Norbu), Heriot-Watt University (Prof. Susan Krumdiek and Dr Paolo Cherubini), and the University of Edinburgh (Dr Desen Kirli) along with Orkney Housing Association Limited (OHAL) and other local organisations, including Community Energy Scotland and THAW Orkney (an energy advice organisation). The research used a digital environment to let housing tenants consume energy as if they were experiencing dynamic pricing, and worked closely with them to understand their experiences, behaviours and views.

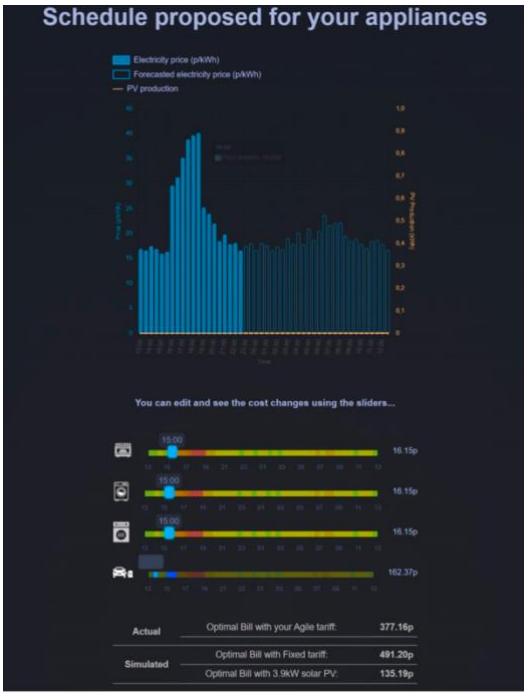


Image shows an illustration of the final mobile phone interface provided to participants. Image credit: Project team

How the fund helped:

- *New social insights:* The trial demonstrated the importance of trusted, person-centred energy advice, and showed how to best design digital interfaces. The findings of the project showed that energy companies should look at increasing flexibility in tariffs to account for the reality of household behaviours.
- *Practical value for partners and participants:* The project developed a repeatable, financially safe process for engaging social housing tenants in flexibility trials.

- *Increased capacity and expertise in participants:* Tenants increased their understanding of price variation and appliance demand. OHAL staff gained insights into digital support needs.
- *Reusable assets:* The project created digital assistants and data-handling pipelines, providing a foundation for future trials and energy-support activities.
- *Policy and industry evidence:* The project provided initial evidence on consumer-led flexibility, highlighting financial safety and data accessibility issues for policy makers.
- *Academic contributions:* The team have had accepted presentations at major conferences, and a forthcoming journal article positions the project as a key case study in meeting national flexibility objectives.

Next steps: The project team has been developing the CARE project into CARE 2.0 to scale the approach and shift the testing window to winter, when heating and hot water needs are greatest and trade-offs between comfort, cost and flexibility are most visible. The team will also develop a website based on the mobile app, and target further funding opportunities to scale up the work.

Beyond Net Zero Built

The challenge: The built environment accounts for 13% of Scotland's total greenhouse gas emissions, and approximately 30% of Scotland's total energy consumption (Scottish Government, 2021). This project looked at different kinds of building insulation standards to better understand the whole-life impact of buildings, from construction, through to its use, and finally its demolition and reuse using digital models. The project achieved this in a novel way. The researchers physically recreated two small-scale houses, and retrofitted one to current standards, and the second to enhanced Passivehaus standards. They packed each with ice and observed how quickly the ice would melt in the 2026 summer heatwave. They then replicated these builds digitally (creating so-called 'digital twins'), and applied different weather conditions to accurately model different buildings performances in a variety of conditions.

The project: Researchers from the University of Edinburgh (Dr Julio Bros-Williamson and Dr Azlizawati Ibrahim) and Edinburgh Napier University (Dr Kenneth Leitch and Dr Andrew Livingstone) collaborated with the New Model Institute for Technology and Engineering (NMITE) (Professor Robert Hairstans), Built Environment - Smarter Transformation (BE-ST) with support from Mike Whitfield Construction, and the Channel 4 programme *Guy Martin's Home Without Bills* to construct and test the buildings, create the digital twins, and develop learning materials.



Image shows TV presenter Guy Martin in one of the 'ice box' houses, filmed for Channel 4.

How the fund helped:

- *New learning materials:* The project created a customisable programme of training on Trimble software platforms. Learning materials developed were to be easily accessible to the greatest possible audience to promote understanding of building performance principles at scale. The learning materials are available here: https://www.youtube.com/playlist?list=PLcuJsajgMoSo
- *New insights into building insulation in heatwaves:* The project was initially intended to illustrate how well airtight and insulated homes require less energy to heat. However, the heatwave experienced in the UK over the summer shifted the focus of this to consider the effect of good ventilation and insulation for cooling buildings. This introduces the simple, yet not widely acknowledged concept that insulation works both to help heat and cool buildings.
- *New public engagement materials:* The work was showcased on the Channel 4 programme Guy Martins Home without Bills, with the related YouTube video achieving over 213k views in 2 months. You can watch the video here: https://www.youtube.com/watch?v=YqAGTSd5Kmo and read more about the Ice Box Challenge here: https://cenz-highdb.ac.uk/guy-martins-ice-box-experiment/

Next steps: Using the pilot buildings and digital twins, the project team will be able to further explore net zero building performance. The team have applied for follow on funding from HCI Skills Gateway to develop enhanced dissemination and training for educators.

CALUM: Controlled agriculture lab using mine water heat

The challenge: This project explored the potential for an agriculture unit fuelled by mine water geothermal energy. Flooded coal mines in rural Scotland contain billions of litres of water at a constant temperature, ideal for use by heat pumps. With a potential heat reserve of 12 GW in the Scottish Central Belt, mine water geothermal (MWG) is a low-carbon thermal resource. The CALUM project explored district heating for Dailly, a village with high electric heating costs. The project assessed the sustainability of this heat resource and the feasibility of a district heating network, providing partners the Cairnhill Group with a full design for the size and type of agricultural unit that could be supported by the mine water energy available in the subsurface.

The project: Dr Neil Burnside from the University of Strathclyde and Dr Laura Hepburn from the University of Glasgow partnered with the Cairnhill Group, an Ayrshire-based farm business, to explore the potential for extracting renewable heat from flooded mine sites.

How the fund helped:

- *New design insights:* The project has provided the Cairnhill Group with a full design for the size and type of agricultural unit that could be supported by the mine water energy available in the subsurface.
- *Career development:* Enhanced career and skills development, especially in communication with diverse stakeholders, and Expanded networking opportunities beyond academia.
- *Process insights:* Improved understanding of effective and ineffective approaches to similar industry and academic projects for future endeavours.

Next steps: The project is also supported via an Engineering and Physical Sciences Research Council Impact Acceleration Account (EPSRC-IAA) through the University of Glasgow so will continue to develop.

Waste and circular economy

MycoPack: Turning whisky waste into sustainable packaging

The challenge: Scotland's whisky industry generates substantial quantities of leftovers, including spent grain and pot ale. This project explored how to repurpose this waste into packaging based on mycelium composites (a kind of fungus) which could replace fossil-derived

and energy-intensive packaging materials. The project wanted to not only demonstrate the practical feasibility of converting distillery waste into mycelium composites, but also their suitability for practical packaging applications in a business context. This required overcoming technical barriers including composite performance, design and stability, along with circular business challenges such as manufacturability and product function. The project therefore sought to establish a circular economy pathway in which waste generated during whisky production could be converted into sustainable packaging for premium spirits products.

The project: Researchers from the University of Dundee (Dr Wenbin Zhou) and Edinburgh Napier University (Dr Dongyang Sun) collaborated with Arbikie Distillery, a sustainability-focussed distillery near Dundee, to design a proof of concept that works both technically and in a business context.



Image shows the prototype product made from whisky leftovers: Credit project team

How the fund helped:

- *New scientific insights:* The project generated new knowledge on the relationships between biomass feedstock, fungal species, cultivation conditions and composite performance.
- *Circular economy and packaging:* The project demonstrated a potential higher-value route for converting distillery biomass residues into functional packaging materials, supporting the development of circular alternatives to conventional packaging.
- *Engineering and manufacturing:* The project established a design and prototyping approach for reusable, bottle-specific moulds, addressing practical challenges including ventilation, demoulding, dimensional stability and shrinkage.

- *Collaboration and knowledge exchange:* The project strengthened collaboration between Napier, Dundee and Arbikie, while establishing links with MycoPunks Limited, Smurfit Westrock UK and Grown Bio.
- *Career development:* The project provided interdisciplinary training in fungal cultivation, biomaterials manufacture, materials characterisation and industry engagement.

Next steps: The team will build on the MycoPack results through further funding applications and industrial collaboration. This includes developing a longer-term research programme on mycelium-based composites using a wider range of agricultural and industrial biomass residues, while continuing prototype development and industry engagement with Arbikie and other partners. Further work will focus on manufacturing repeatability, packaging optimisation, environmental assessment and scale-up. The team will also explore opportunities to support the Research Assistant to develop a PhD project focused on mycelium-based composites and sustainable packaging materials.

TRACE: Creating a digital marketplace for reuse hubs

The challenge: Despite policy ambitions to transition to a circular economy, the construction sector relies on virgin materials, with significant quantities of reusable materials still being discarded. Using more recycled materials in construction has many environmental benefits, such as reducing the energy used in extracting raw resources and creating materials, and saving transport emissions from using materials closer to home. However, there are many barriers to increasing the use of recycled materials including limited reuse infrastructure, fragmented supply chains, lack of reliable information on available materials, uncertainty around quality and provenance, and insufficient digital tools to support material reuse. TRACE explored how digital technologies could help overcome these barriers and make material reuse more accessible, trusted, and scalable.

The project: This collaboration between Robert Gordon University and Heriot-Watt University, led by Dr Michele Victoria and Dr Theodoros Dounas, Adventurous Systems and Stirling Reuse Hubs created a digital marketplace to reuse building materials. The team worked closely with people involved in construction to understand their needs. They built a prototype using technology to track materials with QR codes and keep digital records of their history and quality (shown in image above). They showed and tested this prototype with others at an event in Stirling. The platform is available at: https://trace.adventurous.systems

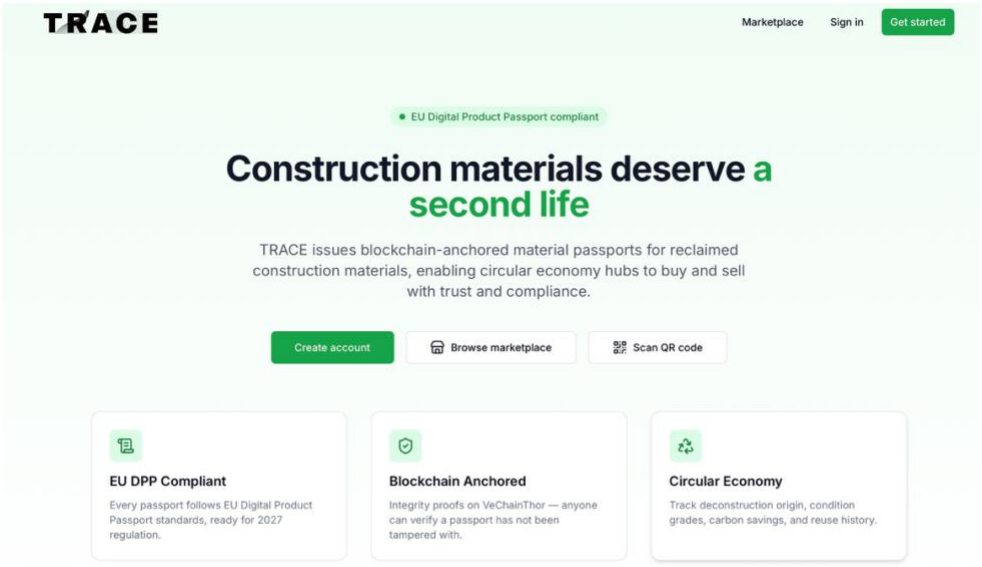


Image shows screenshot from TRACE platform

How the fund helped:

- *New research insights:* TRACE generated new knowledge about the technical, organisational, and behavioural barriers affecting construction material reuse. The team has shared the insights at industry and academic conferences.
- *An open resource:* The project successfully delivered and demonstrated a functioning prototype digital marketplace, showing how blockchain and material passports can improve transparency, traceability, and trust in reused materials. This platform is open for use, enabling circular economy hubs to buy and sell recycled products with trust and confidence.
- *Capacity building:* The project increased awareness of the opportunities offered by digital technologies to support circular economy practices and provided an evidence base to inform future policy and sector-wide implementation among organisations involved in construction. The project also built capacity among researchers and practitioners through co-design activities, workshops, and knowledge exchange events.

Next steps: The next phase will focus on refining and expanding the prototype, undertaking further testing in real-world settings, and exploring opportunities to scale the solution across Scotland. The team will continue collaboration with industry, reuse hubs, and policymakers while disseminating findings through publications, conferences, workshops, and public engagement activities. Further funding applications are expected to support platform development, larger-scale pilots, and broader implementation. The team has applied to two follow-on funding schemes: AHRC Design Generators (£200k) and Horizon Europe (€9.5M).

Digital Product Passports

The challenge: Like TRACE, this project helped to reduce the environmental impact of the construction industry. However, this project focussed specifically on social housing in Scotland. This sector increasingly involves new construction by housing authorities so faces similar challenges in emissions and virgin material use as in private sector construction, yet brings distinct challenges in procurement, maintenance, and regulation. This research explored opportunities to increase reuse and recycling of materials in social housing. Beginning in Glasgow, the project showed how circular city models in social housing can work for other cities in Scotland, fostering inclusive and collaborative planning.



Image shows new build social housing in Scotland

The project: Glasgow Caledonian University and University of Glasgow researchers (Dr Michael Tong and Prof Craig Thomson from GCU and Dr Abraham Zhang and Prof Ming Lim from Glasgow) collaborated with Wheatley Group, the UK's largest builder of social rented homes, to build a digital product passport (DPP)-enabled circular supply chain that was appropriate to the particular drivers and barriers that impact on social housing.

How the fund helped:

- *New policy insights:* The research showed that the biggest challenge is not the technology itself, but creating the policy, business, data and supply chain conditions needed for successful adoption. The research showed that housing associations would benefit from targeted pilots which can build the business case incrementally, and help develop internal and supplier capabilities ahead of future regulatory requirements.

- *Direct applications for the Wheatley Group:* The findings from the research will inform the Wheatley group with their sustainability framework.
- *Academic insights:* The research has been presented at international construction industry conferences, sharing knowledge on the specific improvements that can be offered by DPPs.
- *Impacts on tenants and housing association staff:* The research showed that DPPs can improve the maintenance of properties, providing faster and more reliable services for tenants, as well as more effective processes for housing associations such as more effective procurement and supplier management and enhanced sustainability reporting.

Next steps: The project will continue to share its insights and will apply for further funding when opportunities arise.

Peatland restoration

From philosophical foundations to practical land-use decisions

The challenge: Peatlands are vital ecosystems in Scotland and a key route to Scotland achieving net zero. Restoring damaged peatland is an important way for Scotland to absorb carbon and reduce our overall CO2 emissions. However, the ways in which we measure the emissions impact of peatland restoration over time is debated. Degraded peatlands emit CO2; but while restoring them reduces these emissions, restoration efforts can cause a temporary increase in emissions of methane. Methane is itself a powerful greenhouse gas, causing more harm to the climate in the short term, but is also much shorter-lived than CO2. Fully accounting for the significance of emissions, emissions reductions, and the sequestration of greenhouse gases therefore requires considering both long-term effects on temperature, and the damage caused in the shorter term - how can we weigh effects across different time scales? Investigating this question may provide new insights into which peatland interventions should be prioritised, where special attention to methane mitigation may be needed, and how timing of interventions might maximise climate benefit.

The project: Combining insights from sustainable land management teams' expertise in greenhouse gas accounting, peatland ecology and ethical philosophy, the research group developed a new framework for accounting for the climate benefits of peatland restoration that enables users to consider different impacts through time. Led by Dr Derek Ball (St Andrews) and Prof. Matthew Brander (Edinburgh), the project is a collaboration between: Dr Caroline Touborg (independent scholar); colleagues at Corrour Estate including Charlie Davis, Lea Ruegg,

and John Sutherland; Dr Lydia Cole (Geography, St Andrews), and Professor Tim Mulgan (Philosophy, Auckland and St Andrews).



Image shows the Corrour Estate. Image credit: Gayle McIntyre

How the fund helped:

- *New scientific insights:* The project team developed new approaches to carbon accounting for land use, and new metrics for comparing emissions of different greenhouse gases, which are grounded in philosophical thinking about our responsibilities to the future. These ideas will help produce accounting standards that more accurately track the effects of climate change, and highlight which affects are most important. This will allow organisations and individuals making decisions about land use (including land managers and developers) to accurately take account of climate impacts over different timescales.
- *Developing new collaborations*: The team has developed a distinctive cross-disciplinary and land-use expert collaboration which has enabled experts to learn from each other's experience and approach. Academics have learned about on-the-ground restoration work. Colleagues in the humanities have had the opportunity to learn from experts in greenhouse gas accounting and ecology, and have shared insights from moral philosophy. This collaboration will be well-placed to continue interdisciplinary work.
- *Career development:* The project has helped Dr Touborg, an independent scholar, remain closely connected with academic research.

- *Academic publications:* The team has published one paper (so far) from the project: Touborg, C., & Ball, D. (2026). GHG accounting needs two metrics: stabilisation temperature and damage. Carbon Management, 17(1).

Next steps: The team is exploring opportunities for further funding to continue the collaboration.

Monitoring peatland restoration with novel geophysical methods

The challenge: Peatlands are important carbon stores, holding vast quantities of carbon in the ground. More than 20% of Scotland is covered by peatland, making healthy peatlands an important part of Scotland's response to climate change. However, an estimated 80% of Scotland's peatlands have been degraded by long-term disturbance (NatureScot). Degraded peatlands can release carbon dioxide rather than storing it, contributing to greenhouse gas emissions. Peatland restoration is therefore a key part of Scotland's climate change strategy. To restore peatlands effectively, we need to understand how their underlying geology and hydrology interact, and how these systems change following disturbance and restoration. This requires methods that can monitor large areas of peatland over time. Existing approaches are often invasive, labour-intensive and limited to relatively small areas.

The project: Led by Dr Karen Lythgoe, NERC Independent Research Fellow, University of Edinburgh and Dr Amy Gilligan, Lecturer, University of Aberdeen, the project brought together a new interdisciplinary team of geophysicists at the Universities of Edinburgh and Aberdeen, ecologists and hydrogeologists at the James Hutton Institute and peatland practitioners at NatureScot. The James Hutton Institute provided access to a research peatland site and shared complementary environmental data, allowing the team to test the geophysical methods alongside existing ecological and hydrological observations.

How the fund helped:

- *New scientific insights:* The project generated new knowledge about how a range of geophysical techniques can be applied to peatlands, including both their ability to image peat structure, and their practical suitability for working across remote and challenging terrain.
- *New collaborations:* The research has also established new, lasting collaborations between geophysicists, environmental scientists and peatland practitioners, creating a foundation for further interdisciplinary research. The main beneficiaries are peatland restoration practitioners, environmental engineers and regulators, who need efficient

and reliable ways to assess peat depth and monitor restoration. The methods are also relevant to ecologists and peatland researchers, providing a way to investigate how restoration affects subsurface properties and identify the depth and extent of changes occurring below the surface.

- *Career development:* The project provided training and research experience for early career researchers, and has directly led to follow-on research and funding.
- *Teaching and learning opportunities:* The project provided the basis of two MSc dissertations at the University of Aberdeen and one undergraduate dissertation at the University of Edinburgh.



Image shows the team conducting an Electrical Resistivity Survey on Cairn O Mount. Image credit: Project team

Next steps: The work is already being extended to additional peatland sites, allowing the team to test the methods in a wider range of environments and restoration settings. The team has secured follow-on funding from RSK Group and Peatland Action to continue developing and applying the approach, along with continued collaboration and publication plans.

Transport

Unpacking the tourism-transport nexus in sustainability transitions

The challenge: While the interrelationships between tourism and transport are of key importance to the wider tourism system, little is known about how they influence each sector's journey to net zero – one of the key objectives for the Scottish economy. Given the strategic

significance of transport to net zero targets on the one hand, and the economic importance of tourism to the Scottish economy on the other, this project addresses this lacuna and builds a basis for more nuanced interdisciplinary research that will lead to concrete solutions and policy implications in support of net nero.



Image shows the iconic Glenfinnian Viaduct, one of Scotland's many tourism hotspots that could benefit from increased public transport options

The project: This project was a collaboration between Dr Piotr Niewiadomski (Senior Lecturer in Human Geography, School of Geosciences, University of Aberdeen), Dr Mark Beecroft (Senior Lecturer in Transport Studies, School of Engineering, University of Aberdeen), Dr Irma Booyens (Senior Lecturer Work, Employment and Organisation (Strathclyde Business School, University of Strathclyde, Glasgow), Dr Neil Ferguson (Senior Lecturer Civil and Environmental Engineering (School of Engineering, University of Strathclyde, Glasgow), partnering with the North-East of Scotland Transport Partnership (Nestrans) – the statutory Regional Transport Partnership (RTP) for Aberdeen City and Aberdeenshire. Nestrans played a significant role in framing the research, recruiting participants and providing a North-East Scotland perspective. The team worked together to understand the strategic roles of tourism and transport in achieving net zero, using stakeholder engagement and extensive research.

How the fund helped:

- *New knowledge and insights:* The project has revealed that the interrelationships between tourism and transport are complex, multi-dimensional, often place-specific and often difficult to disentangle. As such, they influence each sector's journey to net zero in

multiple context-specific ways and, to help both sectors transition to sustainability, a deeper understanding of the two sectors and their operations in various geographical contexts is necessary.

- *New connections and networks and capacity building:* The project has been particularly successful in linking stakeholders from the two sectors with each other and with academic researchers and encouraging them to engage in this conversation more deeply. As a result, an important network of stakeholders has developed from this project. The research team will again engage with many non-academic partners when larger grant applications are developed to pursue this agenda further.
- *Changes to policy:* The research on the interrelationships between tourism and transport and their influence on net zero will result in policy implications that will help both sectors as well as various regions and localities across Scotland to implement relevant sustainable practices.

Next steps: The team plan to scale up the work and make a funding proposal when the right opportunity arises.

Report by: Dr Kate Symons, Senior Research Partnership Manager, Scotland Beyond Net Zero

Find out more: https://scotland-beyond-net-zero.ac.uk