



SCOTLAND BEYOND NET ZERO SEED FUND AWARDS 2026

Climate finance

Blending Finance for Nature Restoration: Examining Data, Knowledge, Practice and Politics of Connecting Actors and Allocating Capital for Ecologically Beneficial and Socially Just Outcomes

Project leads: Dr Shona Russell, University of St Andrews; Professor Colin Dey, University of Dundee

Abstract: Scotland's ability to achieve net zero and biodiversity targets depends on practitioners and communities having the knowledge and skills to successfully finance and manage nature restoration projects. However, developing and managing initiatives to effectively deliver socially just and ecologically beneficial outcomes is complex and challenging. A key aspect of this involves efforts to combine public, private and philanthropic funding sources – a practice increasingly termed 'blended finance'. In collaboration with Bioregioning Tayside, this project examines innovative efforts to finance nature restoration and community resilience through the design of new financial mechanisms and arrangements that bring together local communities, national agencies and international financial entities. Situated in the River Isla catchment, this project will explore the perspectives and expectations of community groups, policymakers, financial intermediaries, scientists, regulators and landowners, and develop new insights into how blended finance arrangements can be established and governed to channel finance towards nature restoration projects involving communities.

Green financial market creation in Scotland

Project leads: Professor Patrick Bayer, University of Glasgow; Professor Ben Cormier, University of Strathclyde

Summary: Climate finance is essential for meeting Scotland's net zero target by 2045. Doing so requires £1bn annually, placing financial markets at the heart of Scotland's decarbonisation efforts. However, these markets remain underdeveloped. This project studies *how to enable the creation of a mature green financial market in Scotland*. Analytically, we focus on applying successful green market creation models from European comparator countries to Scotland. Informed by Scottish green finance stakeholders' needs, we will co-produce a green market creation framework that outlines structural, institutional, and systemic levers to better connect



green capital with a robust pipeline of climate projects. We will disseminate our findings at a capstone symposium in Edinburgh, during the London Climate Action Week, and through academic and policy publications. Our project provides a rigorous and much-needed analysis of how to fast-track green financial market creation in Scotland and devises actionable guidance that is critical for Scotland's energy transition.

Energy

Warming Up Aberdeen: integrating optimised subsurface data and drilling for geothermal heating provision

Project leads: Prof Claire Bond, University of Aberdeen; Dr David Cornwell, University of Aberdeen; Prof Phil Hassard, Robert Gordon University

Summary: Aberdeen is known as the granite city, but could this eponymous name provide NE Scotland with the heat it needs to meet net zero targets? The Warming Up Aberdeen project aims to answer this by generating new subsurface data and drilling models to reduce risk for future geothermal investment. As we look for renewable heat sources to meet Scotland's demands and ensure energy security, deep geothermal heat from rocks such as granite are attractive for longevity and low emissions. This project tackles key challenges in delivering geothermal in Aberdeen: lowering drilling costs, reducing geological uncertainty, and pinpointing ideal sites for further development. This work builds on three complementary initiatives across the city led by project partners to attract investment and support Net Zero goals.

Seal-Turbine Interaction and Behaviour-Informed Tidal Energy Design Project

Project leads Prof. Mamdud Hossain, Robert Gordon University; Dr Gordon Hastie, St Andrews University

Summary: How to improve life for marine mammals like seals, while ensuring wind energy expansion? This project will create a design framework for tidal turbines that considers interactions with seals and other marine mammals. Although tidal turbines are seen as environmentally friendly, their impact on aquatic life is not well understood, hindering large-scale deployment. Traditional models oversimplify seals' behaviour by treating them as passive particles, ignoring their complex, sensory-driven responses to dynamic marine environments. By integrating marine biology with turbine hydrodynamics, the project seeks to understand how seals react to turbine flows, such as vortices and turbulence. The hypothesis is that turbine design can be optimised not only for energy efficiency but also to shape flow fields that encourage seals to avoid the blades while maintaining natural behaviours. This collaboration



between Robert Gordon University and the University of St Andrews combines expertise in fluid dynamics and marine biology. Engaging stakeholders including tidal energy developers and environmental regulators, the project will host co-design workshops to define ecological thresholds and mitigation strategies, ensuring practical impact.

Understanding Interfacial Processes in Aqueous Zinc-Ion Batteries Using Operando X-ray Diffraction

Project leads: Dr Pei San (Sharel) E, University of Edinburgh; Dr Oxana Magdysyuk, University of St Andrews

Summary: Improving energy storage is crucial to Scotland's clean energy plan, with aqueous zinc-ion batteries offering a safer, lower-cost, and more sustainable solution compared to conventional lithium-ion batteries. These batteries use abundant zinc and water-based electrolytes, presenting an attractive alternative. However, challenges arise from unwanted reactions during operation that reduce performance and lifespan. This project aims to understand and control these processes to develop more durable battery technologies, supporting Scotland's transition to a cleaner, more resilient Net Zero energy system. The partnership involves the University of Edinburgh, leading on electrochemistry, electrolyte design, and battery testing, having developed novel chemical additives that enhance cycle stability significantly (UK Patent Application 2608676.9, April 2026). The University of St Andrews contributes expertise in powder X-ray diffraction and operando structural analysis. Additionally, the Fife Communities Climate Action Network (FCCAN) integrates a non-university perspective, aligning research with community energy priorities and Scotland's net zero goals.

Implementing Clean Heat in Scotland's New Build Homes: Challenges, Opportunities and Pathways for Sustainable Energy Adoption under the New Build Heat Standard

Project leads: Dr Sohail Ahmad, University of the West of Scotland; Prof Professor Ken Gibb, University of Glasgow

Summary: New homes in Scotland must now use climate-friendly heating systems under the New Build Heat Standard (NBHS), introduced in April 2024 and updated in January 2025. This means that new-build houses can no longer install gas or oil boilers, and instead must use low-carbon options such as heat pumps or heat networks. These changes are an important part of Scotland's journey to becoming a net-zero nation. However, early evidence from government updates and independent research shows that builders, councils, and households are experiencing real challenges in putting these new heating systems into practice. These include higher installation costs, shortages of qualified installers, rural infrastructure issues, and



uncertainty caused by the delay to the wider Heat in Buildings Bill, which will set long-term rules for existing homes. This project aims to understand what is happening on the ground as Scotland shifts to clean heating in new-build homes. We will speak directly with people involved in this transition – housing developers, local authority teams, energy organisations, and residents living in new-build housing. These conversations will help us understand what is working well, what is proving difficult, and what kinds of support or guidance are needed to make clean heating systems easier to install, use, and maintain.

Climate justice and community engagement

Exploring the potential of open-source creative mesh network prototypes as a form of community resilience

Project leads: Dr Martin Skelly, University of Dundee; Dr Loraine Clarke, University of St Andrews

Summary: In response to increasing climate adversities, this project seeks to bolster community resilience by fostering local decentralised agency in the villages of Meigle and Ardler. These communities face frequent flooding, power outages, and mobile signal failures due to extreme weather events. Amid government budget cuts and overstrained resources, the collaboration between local stakeholders, the University of St Andrews, and the University of Dundee explores innovative solutions through community co-design workshops. The focus is on creating bespoke open-source mesh networks that allow for robust, self-sustaining communication systems. These systems provide alternatives to top-down, dependency-laden infrastructures that require external maintenance and are vulnerable to power disruptions. By empowering the Community Development Trust and resilience teams formed post-Covid, the project aims to develop an open-access kit enabling communities to establish independent communication systems, thereby enhancing their self-reliance and resilience in the face of climate challenges.

Sustainable healthcare

Improving Net Zero Transport Access to Healthcare in Rural Scotland

Project leads: Prof Pat Langdon, Edinburgh Napier University; Dr Nicholas Davies, Glasgow Caledonian University

Summary: Access to healthcare in rural Scotland is challenged by transport availability, higher costs, service complexity, and high carbon emissions. As rural populations age and specialist care centralises, patients face longer, more complicated journeys. Simultaneously, cuts to NHS



patient transport and local transport pressures exacerbate these issues, making it difficult for communities to attend appointments. Travel modes often involve multi-leg journeys, including road, ferry, and air. Poorly designed decarbonisation measures could unintentionally increase inequality in healthcare access. This project seeks to transform rural healthcare transport to support Scotland's net zero goals through a systems-based approach. Collaborating with Edinburgh Napier University, Glasgow Caledonian University, and the Scottish Rural & Islands Transport Community CIC (SRITC), the project will investigate how barriers differ by location and transport mode, identify stakeholder agreements or disagreements on solutions, and determine feasible short- and long-term interventions.

Co-designed, low-carbon storage solutions for sustainable hospital medicine logistics

Project leads: Dr Andrew Wodehouse, University of Strathclyde; Dr Lucy Robertson, Heriot-Watt University

Summary: Hospitals depend heavily on plastic containers, trays, and bins for transporting medicines and supplies, yet these are often not designed for specific clinical needs. This project, in collaboration with NHS Greater Glasgow & Clyde (NHSGGC), identifies issues such as congestion, poor visibility, waste, and inefficiencies within Queen Elizabeth University Hospital (QEUH). These problems contribute to unnecessary carbon and material waste. The initiative explores using low-carbon, bio-based, and recycled materials to create more sustainable storage solutions catered to clinical settings. By leveraging advances in sustainable materials, the project will work with NHSGGC to investigate alternatives to plastic, including mycelium, cork, flax, seagrass, and recycled paper. This research aims to determine their suitability for both stiff-walled structures, like boxes, and soft bags and pouches. The unique demands of hospital environments — such as sterility, durability, visibility, and stackability — will be integral to defining design requirements aligned with material performance.

Climate-Resilient, Net Zero Hospitals: A Digital Twin (DT) Approach for Scotland

Project leads: Prof. Berk Canberk, Edinburgh Napier University; Prof. George Loumakis and Prof. Rohinton Emmanuel, Glasgow Caledonian University

Summary: This project will develop a Digital Twin (DT)-based decision-support framework to enable climate-resilient and low-carbon operation in hospitals. With the partnership between Edinburgh Napier University and Glasgow Caledonian University, and NHS Greater Glasgow and Clyde (NHSGGC) as the external collaborator, the research will focus on Scotland's largest health board, serving 1.3 million people across 23 hospitals, 9 acute sites, and more than 72 health centres and clinics. The DT framework will integrate operational building data, energy



performance information, environmental and climate-risk indicators to create dynamic virtual representations of hospital assets. It will support scenario-based assessment of renewable energy, decarbonisation, and climate-adaptation interventions with specific twinning parameters. Aligned with the NHS Scotland Climate Emergency and Sustainability Strategy, the project will provide evidence-based recommendations for NHSGGC and establish a scalable approach that could support other Scottish health boards in progressing towards net zero.

Sustainable diets

Fairness, Feasibility and Acceptability of Dietary Transition Policies in Scotland

Lead contacts: Dr David McBey, University of Aberdeen; Dr Stuart King, University of Edinburgh

Summary: This project explores how people in Scotland perceive interventions to reduce red and processed meat consumption, a significant contributor to climate impact. Recognising that food choices are influenced by habit, culture, cost, and convenience, it seeks public acceptance for effective policy measures. Collaborating with policy stakeholders, a survey targeting 2,000 Scottish adults will assess which approaches are deemed fair, practical, and acceptable. The survey includes both quantitative and qualitative questions, the latter analysed through computational text analysis and researcher validation. Expertise from the Rowett Institute, University of Aberdeen, and the University of Edinburgh will inform the study, with policy grounding from the Scottish Government. Findings will be presented in an accessible online dashboard, policy brief, and open dataset, highlighting public support and concerns across different groups. This will guide targeted, evidence-based strategies for dietary change in Scotland.

Circular economy

Complex Circles – Navigating Share and Repair Ecosystems in Scotland through Game Based Learning

Project leads: Dr Lucy Wishart and Dr Shawn Bodden, University of Edinburgh
Dr Franziska Paul and Dr Timothy Peacock, University of Glasgow

Summary: This project addresses a research and policy gap focusing on Share and Repair Organisations (SROs) in Scotland, pivotal for sustainability and inclusive growth under the Circular Economy (Scotland) Act 2024 and the Community Wealth Building Act. Recognised for reducing consumption and supporting local economies, SROs such as tool libraries and repair cafes face challenges in management due to their reliance on infrastructure, logistics, and



volunteer support. With over 100 SROs in the network, they significantly contribute to social value and carbon savings but struggle with rising costs and space limitations. Collaborating with Circular Communities Scotland and other experts, the project will explore how SROs manage infrastructure for community economic activities. Findings will be communicated through a scenario-based learning game, engaging policymakers and the public with the operational realities and fostering a transition towards just and sustainable futures in Scotland.

A living lab approach to decarbonising the Scottish festival sector: a case study of reusable cups and serveware

Project leads: Prof. Matt Brennan, University of Glasgow; Prof. Jane Ali-Knight, Edinburgh Napier University

Summary: Music festivals significantly boost Scotland's economy, with DF Concerts' 2025 programme alone generating £164.6 million. However, festivals are resource-intensive, necessitating a shift towards net zero. Their temporary and recreational nature offers a unique opportunity to influence audience waste reduction behaviours across the sector. This project employs a 'living lab' methodology, engaging diverse stakeholders—audiences, researchers, festival promoters, and green industry experts—in real-life festival settings to co-create and test solutions. By operating in unpredictable environments, this approach reveals barriers and opportunities not visible in controlled settings. Using a circular economy framework, designed to keep resources in use and minimize waste, the project aligns with the Circular Economy (Scotland) Act 2024. It explores current challenges for Scottish festivals, particularly with reusable cups and serveware. The living lab approach will be applied to assess reusable uptake challenges at Summer Sessions in Glasgow and Hidden Door Festival in Edinburgh, both in June 2027.

Towards sustainable funeral provision: establishing a network and scoping a research agenda to integrate sustainable environmental considerations into the pursuit of good funerals for all

Key contacts: Prof. Vikki Entwistle, University of Aberdeen; Dr Racheal Adedokun, Robert Gordon University

Summary: This project seeks to engage key stakeholders in shaping a research agenda to mitigate the environmental impact of funeral practices and build a supportive network in Scotland and beyond. Recognising the importance of respectful funeral provision, the project acknowledges that perceptions of what constitutes a good funeral vary widely due to cultural, religious, and personal values. While environmental considerations are increasingly important, the impacts and sustainability of various funeral practices are not well understood, and



concerns about "greenwashing" persist. Some proposed eco-friendly measures may have unintended consequences, conflict with deeply held beliefs, or be inaccessible. The recent legalisation of alkaline hydrolysis in Scotland and emerging body disposal technologies underscore the urgency for research to ethically advance sustainable funerary options.