



Responsible research and Innovation Policy Experimentations for Energy Transition

This document sets out a vision for the Outer Hebrides energy ecosystem in the year 2040. The vision was developed collaboratively by stakeholders involved in the Outer Hebrides energy sector through the RIPEET project.

Outer Hebrides 2040 Energy Vision (Summary)

2040 sees a much-changed energy ecosystem for the Outer Hebrides which better meets local needs and utilises the world class energy resources and pioneering communities of the region. Current strengths of the Islands such as community ownership and energy innovation have been retained whilst dramatic progress has been made on energy issues that have hampered local development, such as an inconsistent stakeholder collaboration, limited grid resilience, grid constraints and fuel poverty.

By 2040, **fuel poverty** in the Outer Hebrides has, as far as is reasonably practicable, been eradicated following several technical, social, policy and behavioural interventions; making the islands an attractive place to live and for business to operate. Energy related supply chains, involving installers, materials suppliers, and contractors, have been strengthened, creating a significant number of local, green jobs.

The **local electricity grid** is “smart”, resilient and responsive due to integration with new technologies for managing, generating and storing energy. There is greater use of smart-metering in households and businesses and local network monitoring by the DSO.

Healthy **collaboration** across energy stakeholders within academic, public, private, community and environmental sectors continues in 2040. Comhairle nan Eilean Siar continue to play a key supportive role for energy projects, having been central in establishing a Regional Energy Consortium and supporting its management to facilitate collaboration on energy projects, foster greater local engagement with energy and develop Hebrides Energy, a local energy supply company (ESCo).

The combination of technical advancement and improved collaboration across sectors has driven the region to develop bespoke solutions to overcome energy challenges and become a pioneer in energy transition.



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Outer Hebrides 2040 Energy Vision (Extended)

2040 sees a much-changed energy ecosystem for the Outer Hebrides. A system which better meets local needs and utilises the world class energy resources and pioneering communities of the region. Current strengths of the Islands such as community ownership, innovation and stakeholder collaboration have been retained whilst dramatic progress has been made on energy issues that have hampered local development, such as a lack of grid resilience, generation capacity limits and fuel poverty. These advancements have been made through attracting research, technology and investment to the Islands and successful campaigns to revise national and regional policy and regulation to favour island circumstances. This has been underpinned by committed and consistent collaboration between stakeholders and continued strong, inclusive leadership by the local authority, Comhairle nan Eilean Siar, and local communities.

Fuel Poverty

By 2040, fuel poverty in the Outer Hebrides has, as far as is reasonably practicable, been eradicated. No more than 5% of households are fuel poor, no more than 1% are in extreme fuel poverty and the fuel poverty gap is no more than £250 (2015 prices). This change has come about due to several interventions making the islands an attractive place to live and for business to operate including policies and grants aimed at tackling fuel poverty. Significant investment in home energy efficiency has seen increasing rates of retrofits and uptake of micro-generation and household energy storage. Local planning policy has further evolved to facilitate this change. Energy related supply chains, involving installers, materials suppliers and contractors, have been strengthened, creating a significant number of local, green jobs.

Some low-tech solutions such as reducing energy consumption or managing consumption using smart meters have been more widely adopted. Those still facing high energy costs are supported by both direct local energy supply and community benefit from large scale commercial on-shore and off-shore energy exporters. Community generators continue to support their local communities to address fuel poverty.

Local Energy Network

The local electricity grid is “smart”, resilient and responsive due to integration with new technologies for managing, generating and storing energy. There is greater use of smart-metering in households and businesses and local network monitoring by the DSO. This allows a more accurate idea of local energy consumption and improved understanding of how the system can be managed. Demand and generation can be better balanced due to various storage vectors within the energy system such as battery storage, pumped hydro and hydrogen. By 2040 hydrogen is providing domestic heat and power and fuel for marine transport, supplied by a local green hydrogen economy. Growing adoption of Electric



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Vehicles (EVs) has created opportunities for Vehicle2Grid (V2G) technology, creating another option to support balancing the grid and mitigating some of the need for grid reinforcement. These changes have enabled greater consumption of locally generated energy in the region.

Several large infrastructure projects have been completed by 2040 such as the Arnish Interconnector and a Harris to Uist cable, increasing Island energy resilience. Island Energy Hubs, sites of energy storage using site appropriate technologies located at key grid nodes, have been established in Barra, Uist, Harris and Lewis through community and private and public partnerships, adding another layer of resilience to the energy system. Network regulators are now required to quantify community benefit of infrastructure developments and local projects e.g. a development would permit more local energy generation rather than focussing on the cheapest means to deliver Net Zero. This has brought more holistic consideration of long-term impacts of infrastructure changes to energy planning.

The majority of onshore energy generation is community owned or moving towards community ownership. This ensures that community voices are heard, listened to and acted on throughout the energy ecosystem.

Regional Energy Collaboration

Healthy collaboration across energy stakeholders within academic, public, private, community and environmental sectors continues in 2040. Comhairle nan Eilean Siar continues to play a prominent role in overseeing energy projects, having supported the establishment of a Regional Energy Consortium and support the management of this to facilitate collaboration on energy projects, foster greater local engagement with energy and develop Hebrides Energy, a local energy supply company (ESCo).

Following coordinated local campaigning, the legislative and regulatory environment has shifted sufficiently to allow for a hybrid energy supply model where local energy demand is primarily met by the local ESCo but can be met with imports from the national grid when required. The coordination of a number of generators through the Regional Energy Consortium, alongside the new grid balancing technologies, helps to ensure that Hebrides Energy can meet energy supply requirements and has fostered local collaboration whilst also ensuring meaningful community engagement in the energy sector.

The Regional Energy Consortium allows industry and community partners to work with academic and educational stakeholders to integrate STEM and energy education within school, university, and community education programmes. High quality materials on the regional energy system and island solutions are readily available helping local people to be informed and aware of energy related challenges, solutions, and opportunities. The creation of locally focussed resources and engagement with schools has led to high levels of community engagement around energy; people in the community are making use of the resources and taking an active role in the energy system.



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