

# CLEAN ENERGY TRANSITION AGENDA

Scottish Off-Grid Communities

**CLEAN ENERGY FOR EU ISLANDS**

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## Preface

This Island Clean Energy Transition Agenda for Scottish Off-grid Communities is the strategic and tactical roadmap for the transition process towards clean energy, as desired by the stakeholders on the islands within this Community. The Agenda depicts a vision of these Communities and encompasses the views, perspectives and expectations of several different islands, and their residents. Its overall aim is to align these by identifying pathways, common goals and effective strategies.

This Island Clean Energy Transition Agenda was developed jointly by Community Electricity Companies and Community Trusts on the islands of Eigg, Muck, Rum, Canna, Fair Isle and Foula, as well as the peninsula of Knoydart. The project was supported by different organisations with the Clean Energy for EU Islands Secretariat and Highlands and Islands Enterprise facilitating with the writing of the document and providing technical advice. Other parts of the project were supported by the Scottish Government, Ricardo Energy & Environment, Scottish Natural Heritage, National Trust for Scotland, Transport Scotland, MOWI and Arisaig Marine Ltd.

This document is the first version of the Clean Energy Transition Agenda for the Scottish Off-grid Island Communities. It illustrates the strategies considered by the Transition Team to accelerate the clean energy transition and provides a baseline for each Off-grid Island Community to work from to produce their own island specific Agenda, should they wish. The Transition Agenda can be modified to reflect any future developments or decisions made as an Off-grid Island Community Group.

In 2019, an Energy System Overview was completed for the all the Small Islands in Scotland. This document provided technical input for the creation of the Transition Agenda and facilitated the research studies and reports completed by the Clean Energy for EU Islands Secretariat.

The Clean Energy for EU Islands Secretariat is an initiative on behalf of the European Commission aimed at catalysing the clean energy transition on EU Islands. The Secretariat is managed by Climate Alliance, REScoop.eu and 3E, and collaborates with a wide range of local stakeholders, authorities, academia and citizens. The work done by the Secretariat is done in close collaboration with local, regional, national and international partners, with particular support from the Technical Educational Institute of Crete and the University of the Balearic Islands.

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## Part I: Island Dynamics

### 1. Geography, Economy & Population

#### Geographic Situation

The communities which fall under the definition of 'Off-Grid' in Scotland are the Isles of Eigg, Canna, Muck, Rum (known as the Small Isles), Fair Isle and Foula (off mainland Shetland)<sup>1</sup>. The Knoydart Peninsula is also included in this definition, despite not being a true 'island' in the geographic sense. The Knoydart Community is serviced by an off-grid power source and is classified as an 'islanded' network. Figure 1 illustrates the geographic spread of the islands, as well as the distance each is from the mainland and, therefore, national grid.

The largest island is Rum, covering around 104km<sup>2</sup>, with the Isle of Muck being the smallest at around 5.5km<sup>2</sup>. Several of the islands offer unique habitats for flora and fauna alike, and have designated areas including SPAs (Special Protection Areas), SACs (Special Areas of Conservation), and SSSIs (Sites of Special Scientific Interest) under Natura 2000. The exposed nature of these islands, with strong winds coming in from the Atlantic and North Seas, means tree cover is limited. The Small Isles are dominated by igneous rocks (predominantly basalt with some Gabbro and Sandstone on Rum) while Foula and the Fair Isle are dominated by sandstone.

None of these islands and communities have, historically, been connected to the national grid. This is primarily due to the very high capital costs for connection to the national network and a low customer base. The shortest (direct) distance from the national grid to any of these off-grid communities is approximately 15km.

#### Demographic Situation

The islands are home to a cumulative population of approximately 500 residents. This increases to approximately 800 in the tourist season. The Isle of Eigg has the greatest number of households (67) with the Isle of Canna having the fewest (11). The tourist season typically

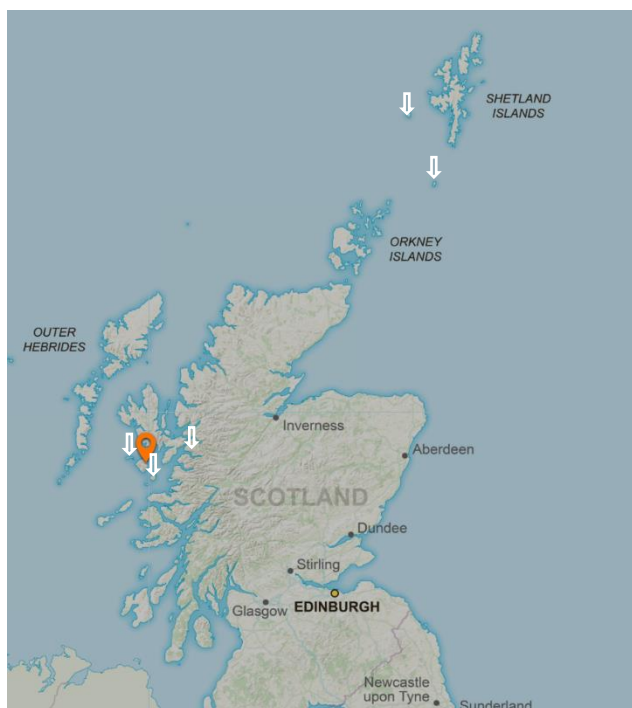


Figure 1 - Map depicting location of the Off-Grid islands as well as the Knoydart Peninsula. (Source: emapsite.com)

<sup>1</sup> Note: This paper does not include the community on the Scoraig peninsula. Although classed as off-grid, they do not have a distribution/supply system but individual household generating stations instead.

spans from April to October and this period sees an increase in energy demand, as well as an increase in transport to and from the islands. All of these activities increase associated CO<sub>2</sub>e emissions from the islands.

In general, most of the islands are of an older demographic but a few of the islands are starting to offer affordable homes which will, hopefully, attract younger residents. An improvement in the quality and reliability of telecommunications means the off-grid islands are becoming more attractive to young families as the type of employment is now more versatile amongst islands residents. However, significant work is still required in some areas to ensure a quality of service that is comparable to the mainland.

## Local Government

The islands are governed by two local authorities. The Small Isles is part of the Highland Council region while the Fair Isle and Foula are part of the Shetland Islands Council. Each of the islands have their own development company or Trust which organises several important public functions, but do not have legal jurisdiction on the respective island.

## Economic Activities

The economies of the islands vary slightly, but the main economic activities are:

- Tourism – visitors exploring the islands, walking, cultural heritage etc.
- Hospitality – B&Bs, self-catering, Restaurant etc.
- Aquaculture – fish farms.
- Agriculture – crofting

In addition to the above there are small scale craft shops as well as fishing boats and, in some cases, yachts. There are also some small-scale food production facilities on the islands and wood-fuel businesses.

All of the economic activities have a strong impact on the islands' greenhouse gas emissions as they involve either transporting people to the island, or goods. All transport to the islands is very fossil fuel heavy. In addition, the majority of the heating and cooking associated with buildings connected to these activities is supported by various types of fossil fuels.

## Connection to the mainland

The off-grid islands have no physical connection to the mainland, with the Knoydart Peninsula being the exception. This is located on the mainland and can be reached via foot and/or an All-Terrain Vehicle. All other communities can only be reached by sea or air. The Small Isles ferry links to Mallaig and Arisaig. These are a mixture of car and passenger only ferries. The ferries run 3-4 times in the winter months and daily during the summer, although it does not call at each island every day. The Mallaig service is operated by CalMac which is a state-owned organisation and uses the *MV Lochnevis* to service this route. Services from Arisaig are operated by Arisaig Marine Ltd which is a private limited company. This route is serviced by the *MV Sheerwater*.

Knoydart is serviced by a passenger ferry link to Mallaig. This operates daily throughout the year and is operated by Western Isles Cruises Ltd.

The Small Isles and Knoydart are also serviced by the Spanish John vessel which is a freight vessel operating out of Mallaig. This vessel is operated by Milligan Transport Ltd and is available as a bookable service (i.e. it is not scheduled). The vessel transports any type of freight required on the Small Isles including, but not limited to, bulk fuel, building materials, agricultural supplies, machinery etc.

The Fair Isle and Foula are linked to the mainland (Shetland Islands) via a ferry service and airplane. Both these islands are classed as 'islands off islands.' Foula is serviced by the *New Advance* which is operated by Shetland Isles Council. It completes a return journey to Walls on the Shetland mainland three days per week. Air transport to and from Foula occurs using the *Islander*, which is a twin-engine aircraft by Briten-Norman, with a daily service (with the exception of Sundays) during the summer months. During the winter it only services Foula on a Monday, Tuesday, Wednesday and Friday.

The Fair Isle is serviced via sea by the Good Shepard IV ferry. This is also operated by Shetland Isles Council and does a return journey to Grutness Pier on the Shetland mainland three days per week during the summer, and one day per week during the winter. Air transport to and from the Fair Isle occurs using the *Islander* (as above). Services to the Fair Isle is a bit more frequent with a daily service during the summer (excluding Sunday) and every weekday during the winter.

One common theme that defines these islands is the lack of an electricity connection to mainland Scotland. The vast majority of the Communities (all bar Isle of Rum) own and operate their own independent electricity systems (generation, distribution and supply). In the case of Rum, the system is owned and operated by NatureScot.

## 2. Energy System Description

As part of the Scottish Off-Grid Communities support to develop and draft the Clean Energy Transition Agenda, the Clean Energy for EU Islands Secretariat dedicated resources to complete a technical study on the Energy Baseline for all Scottish off-grid islands. The study resulted in a report, published in July 2020, which describes the energy system of each of the off-grid islands, as well as providing an overview of the six islands together. This report clearly describes the Energy Systems within the off-grid communities and is attached in Appendix 1. An extract of the report is presented below to highlight the islands' most important features in terms of total energy consumption and electricity mix.

Figure 2 illustrates the energy consumption of the six islands. The energy consumption of the four islands to the West of the mainland (Canna, Rum, Eigg, and Muck) is significantly higher than the energy consumption of the two islands to the North (Foula and Fair Isle). This is because the share of transport to and from the island is very high – around 90% - for these first four islands due to the large energy consumption from the 'MV Lochnevis' ferry, which travels between these four islands daily.

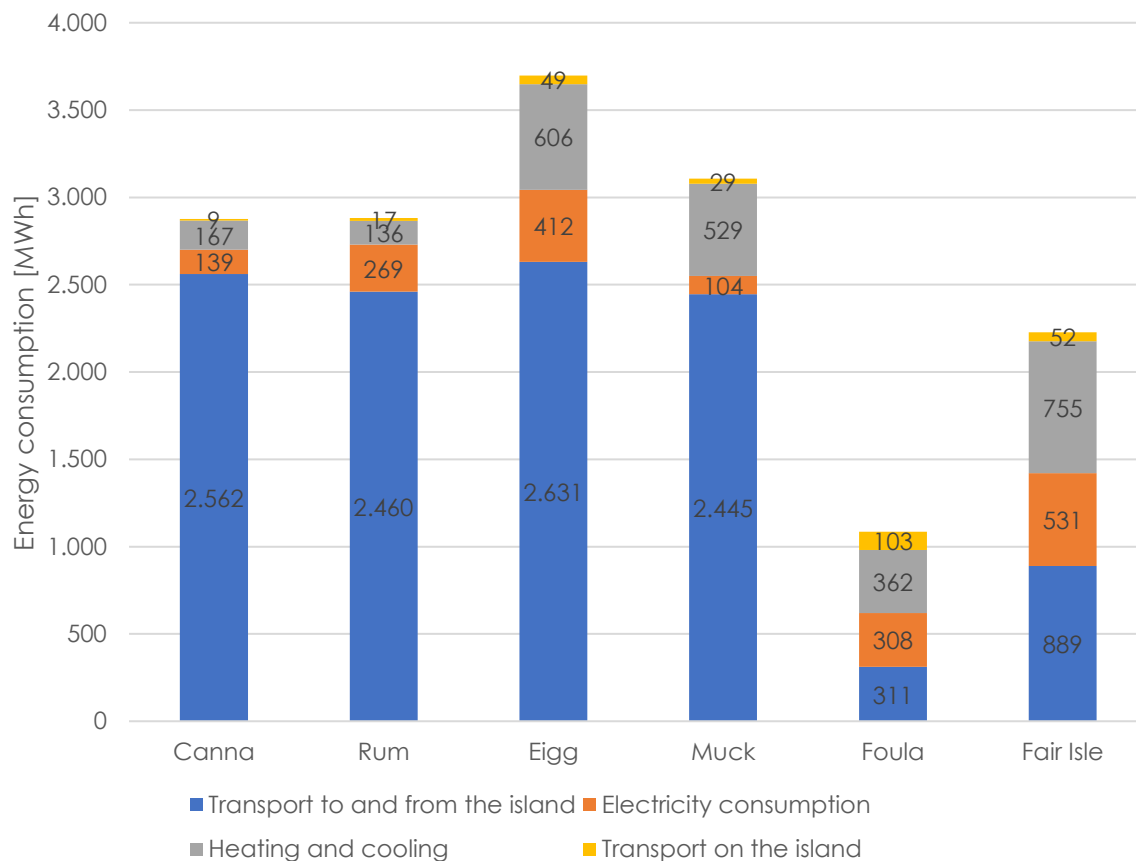


Figure 2 - Total energy consumption of the six Scottish Off-Grid Islands

Figure 3 shows the electricity mix of the off-grid communities. Four of the six Off-Grid Scottish Islands meet their electricity needs almost completely with renewables. Rum and Foula still use diesel generators for about half of their generation. Fair Isle is a special case in the sense that electricity generated for community consumption is almost completely renewable, but a significant amount of diesel is used for British Telecommunications (BT) services.

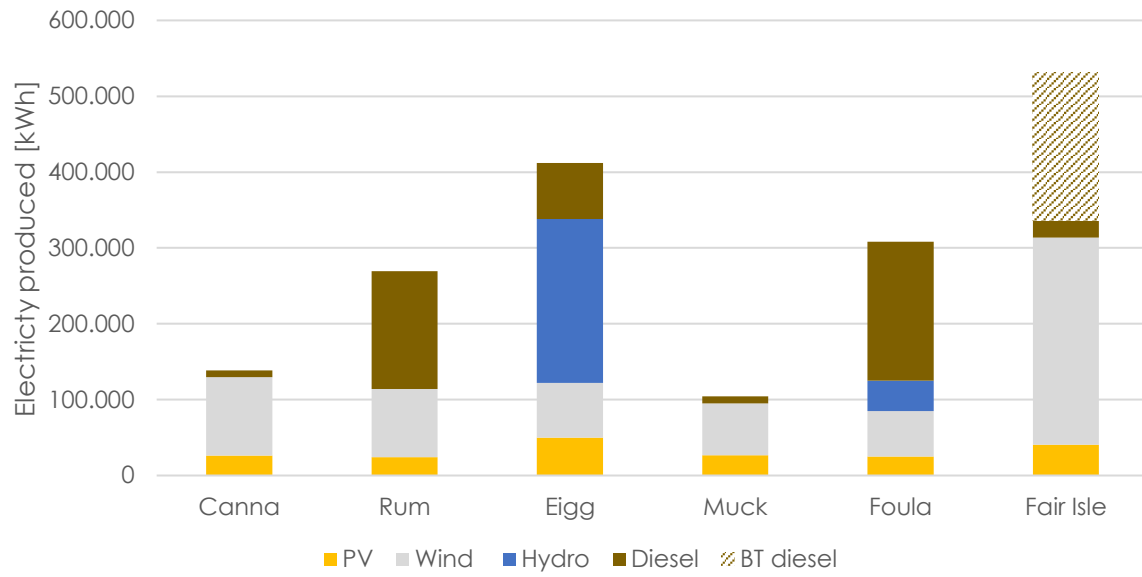


Figure 3 - Electricity mix of the six Scottish Off-grid island communities.



### 3. Stakeholder mapping

An overview of the local actors that are relevant for the clean energy transition on the island is useful to determine the governance of the transition. A comprehensive stakeholder engagement register can be used to identify the decision makers that are important in the process. This allows to identify the stakeholders on the island whose engagement is required in developing the island transition pathways.

#### Civil society organizations

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##### National Trust for Scotland

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The National Trust for Scotland (NTS) is an independent charity that protects and shares some of Scotland's most precious historic places and natural landscapes on behalf of the people of Scotland. They are Scotland's largest membership organisation and are independent of government. The organisation was established in 1931 and focus on pioneering public access to, and shared ownership of, some of the most magnificent buildings, collections and habitats in Scotland. They care for ancient houses, battlefields, castles, mills, gardens, coastlines, islands, mountain ranges and all the communities, plants and animals which depend upon them.

Similar to many large organisations in Scotland, the NTS have a commitment to reduce their carbon emissions and align with the Scottish Government's Net Zero agenda. This will see the Trust have Net Zero emissions by 2045.

The NTS own land on Canna and the Fair Isle and is therefore integral to the Transition Agenda on these islands in particular as no development is possible without landowner consent.

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##### Local Energy Scotland

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Local Energy Scotland (LES) is a consortium made up of:

- Energy Saving Trust
- Changeworks
- The Energy Agency
- SCARF and
- The Wise Group.

The consortium administers and manages the Scottish Government's Community and Renewable Energy Scheme (CARES). In particular, they help communities and rural businesses with:

- Free advice and support to develop renewable energy schemes or to secure and manage income from renewables,
- Advice on funding streams,
- Support to access CARES (development and pre-planning loans),
- Support to access the Renewable Energy Investment Fund (post-consent loans).

The CARES system was established by the Scottish Government to encourage local and community ownership of renewable energy across Scotland, and to help maximise the benefits to communities of renewable energy systems - whether commercial or community-owned. The programme aims to accelerate progress towards the Scottish Government's target of 1GW of renewable energy to be locally or community owned by

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2020, and to assist with delivering the Scottish Government's Energy Strategy through the provision of loan finance, grant funding and specialist advice.

LES have played a pivotal role in the Off-grid Communities' ambitions to improve, upgrade, expand and develop their electricity generation and supply systems. Through the CARES programme the organisation has supported the Communities to, amongst other things, install batteries, wind turbines, PV panels etc.

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### **Community Energy Scotland**

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Community Energy Scotland launched in 2008 to provide detailed, independent and ongoing support for all aspects of community energy project development, from micro to megawatt scale. The organisation is instrumental in broadcasting the specific difficulties faced by the community sector, and in bringing in communities and policy makers together to find new ways forward. The sector has seen significant growth since its inception which has allowed the organisation to engage in a diverse range of projects. It has been involved in supporting over 1400 projects across Scotland, distributing over £15.5m of funding towards community projects.

Community Energy Scotland is a membership-based organisation where members can share knowledge and connect to other Member groups who are developing, or who have already developed, community energy projects. The organisation represents their members and community organisations at policy level and helps keep community energy in the forefront with relevant organisations such as BEIS, the Scottish Government, OFGEM, SSE, Scottish Power and National Grid. They have also been working closely with these organisations to try to resolve many of the state aid difficulties for communities around the Feed-in Tariff.

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### **Scottish Islands Federation**

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The Scottish Islands Federation was established in November 2007, building on its origins as the informal Scottish Islands Network, whose aims are to promote, publicise and advance the interests of Scotland's islands.

Their main objectives are to:

- develop a broad and inclusive membership from all Scottish Islands
- ensure community and voluntary groups have a voice and are well represented within the federation
- work with councils, agencies and the Scottish Executive to ensure that island needs are well understood
- represent the interests of Scottish islands at regional, national and European levels
- share good practices and facilitate information exchange amongst Scottish islanders
- encourage networking on and between islands throughout Scotland and Europe
- acquire, disseminate and utilise knowledge resources for islanders through the Internet

As part of their activities, they are actively promoting the move towards Low Carbon islands, where Scottish islands are leading the way in achieving the Scottish government 20/20 targets in lowering carbon emissions. The Scottish Islands' carbon footprint is already lower than the UK average which more than offsets the high emissions associated with ferry use for islanders despite tourism adding 10% to the overall footprint.

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The Scottish Islands Federation is a member of the European Small Islands Federation.

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## **Businesses- off grid specialists**

Thanks to the off-grid status of these Island communities, several specialist businesses have engaged with the communities to provide support in making their respective systems more sustainable. The ambition to transition from fossil fuel driven off-grid systems has resulted in numerous off-grid specialist businesses to engage, liaise and support these communities with new technology, control systems, and innovative solutions. In some cases, it has also presented the communities with opportunities to participate in testing/trialling emerging technology and/or systems.

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### **Wind and Sun**

Wind & Sun was established in 1984 and now has clients from all over the world. These range from installation companies, utilities, municipal authorities to charities, NGOs and educational establishments. The organisation has extensive hands on experience in the renewables industry, developing many new applications, especially in off-grid locations. Their unique experience with remote power applications includes, most notably, the development of award-winning island 'mini-grid' systems. These systems make use of battery energy storage plus a range of renewable sources to provide residents with a reliable and sustainable 24-hour power supply.

This experience lends them well to providing advice, support and expertise for Scottish off-grid communities, and they have already been involved with the installation of several systems on these islands over the years.

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### **RK Engineering**

Russet Engineering Limited provides electrical engineering and project management support services for power generation projects including island power systems, onshore wind farms, gas generation and hydro generation. The organisation has unique experience in innovative renewable power projects, and links to other service providers to support other project aspects. Part of this experience extends to supporting some of the Scottish Off-grid communities, in particular, the Fair Isle Unified Low Carbon Electricity Storage and Generation Project. This project helped upgrade Fair Isle's ground-breaking wind-diesel power system and extend the supply to the north of the island with a new high voltage network. Russet Engineering was Fair Isle Electricity Company's electrical engineer for the project which is supplying Fair Isle with power from wind and solar generation, including renewable heating energy to the island's homes when surplus power is available.

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### **Energy Mutual**

Energy Mutual was formed in 2013 and is based in the north west of Scotland. They offer services in operation and maintenance of distributed renewable energy assets in remote parts of Scotland, including support services to community-owned microgrids that deliver power to over 80 homes and businesses. The organisation is developing an innovative energy asset management platform to support small energy companies in managing their assets. This will be extremely helpful to communities to develop their pathways.

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## Public Sector

### *Governmental Actors*

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#### **Scottish Government**

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The Scottish Government have set out one of the most ambitious renewables and low carbon energy targets in Europe, and they published their Energy Strategy in December 2017. This sets out the vision for transition to a low carbon energy system. The vision is guided by three core principles:

- a whole system view;
- an inclusive energy transition;
- a smarter local energy model with a priority to empower communities by supporting innovative local energy systems and networks.

These core principles align well with the Clean Energy Transition Agenda. Furthermore, the Scottish Government launched a consultation on a Local Energy Policy Statement in October 2019 (closing in December the same year). This Statement was published to support the aim of the Energy Strategy, which had a commitment to develop a Local Energy Position Paper. This paper would set out a series of key principles and associated outcomes for a broad range of stakeholders to consider during the development of future local energy projects. The aim of the document was to provide key principles that, if adopted during the development of future local energy projects, will deliver the fair and inclusive outcomes Scotland wants.

In addition, the Scottish Government fund the Scottish Community and Renewable Energy Scheme which gives communities advice and funding in all aspects of local, renewable energy. This Scheme is vital to providing financial assistance to island communities with their decarbonisation transition.

The Scottish Government is also key to the support of island communities and recently passed the Scottish Government's Islands (Scotland) Act 2018, which recognised the importance of its Island communities and the impact of legislation and policies on people who live there. This Act refers to a National Island Plan which is aimed at improving outcomes for island communities with new policy and support for rural economies. Improving outcomes for island communities includes:

- a) improving and promoting:
- sustainable economic development,
  - environmental wellbeing,
  - health and wellbeing, and
  - community empowerment
- b) improving transport services,  
c) improving digital connectivity,  
d) reducing fuel poverty
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#### **Highland Council**

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Highland Council is a council area in the Scottish Highlands that is the largest local government area in the United Kingdom, and one of the largest in Europe by landmass. As well as being responsible for the mainland, it is also responsible for numerous small island communities. The local authority work in partnership with Highlands and Islands Enterprise (see below) to assist with community development projects that include the implementation of clean energy technologies.

Highland Council will be working on a Local Heat and Energy Efficiency Strategy (LHEES), a 20-year planning mechanism which considers all aspects of the transformation to an efficient and decarbonised area. This will require a whole system approach to the area and must aim to combine development, refurbishment and upgrading of buildings and systems to have a net improvement towards zero carbon. This LHEES work will align with the Clean Energy Transition Agenda for the off-grid islands in the council area.

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### **Shetland Islands Council**

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Shetland Islands Council is the council area for the Shetland Isles. The local authority has been working in partnership with Highlands and Islands Enterprise to assist community development projects that include the implementation of clean energy technologies.

The Shetland Islands Council has grant funding available to install energy efficient measures in Shetland Households within Council Tax bands A-D. To qualify for grant funding, householders need to register with the council and obtain an energy efficiency assessment. This is achieved through the Council's Carbon Management team whose main work includes:

- Monitoring Council consumption
- Implementing energy saving measures
- Community projects
- HECA and housing surveys
- Fuel poverty surveys
- Public events/presentations
- Energy invoicing and energy contracts

The Community projects element of the programme involves the development of large-scale wind turbine projects, and a potential wind to heat scheme.

In 1997 the Team produced the Home Energy Conservation Act report for Shetland outlining energy use within the existing housing stock, setting a baseline and laying out measures to achieve a 30% reduction in energy use over 10 years. From 1999 to 2007 the Team produced biennial reports on progress against the targets. This was facilitated by assisting the Housing Service in producing energy ratings for existing housing stock.

More recently the Council has implemented as many energy efficient improvements as possible (based on householder willingness) on the Fair Isle by working with local contractors. A similar scheme is planned for Foula.

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### **Transport Scotland**

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Transport Scotland is the national transport agency for Scotland. Its main remit is to deliver a safe, efficient, cost-effective and sustainable transport system. One area includes ferry transport and the organisation is working on reducing emission from these through various means. The organisation supports Ministers in:

- reviewing the National Transport Strategy to determine our vision for transport over the next 20 years
- prioritising investment in Scotland's transport network
- promoting sustainable transport and active travel to reduce carbon emissions and improve public health
- improving road safety
- making transport more accessible for older people and disabled people

Transport Scotland plays a vital strategic part in delivering the Scottish Government's plans for a Net Zero transmission and its Climate Change Plan. Transport is currently the largest sectoral contributor to Scottish emissions, and it is TS' intention to take bold action to meet our emissions reductions targets, alongside achieving a green recovery from Covid-19. Transport Scotland published the National Transport Strategy (NTS) in February 2020 which sets the vision for transport in Scotland for the next 20 years. The vision is to have a sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.

Transport Scotland's vision is underpinned by four Priorities:

- Reducing inequalities
- Help deliver inclusive economic growth
- Take climate action and
- Improve our health and wellbeing

These Priorities are the basis upon which TS take decisions and evaluate the success of Scotland's transport policies going forward.

The climate change priority sets out the need to reduce travel by unsustainable modes and this strategic aim will guide TS' actions as they respond to the impacts of Covid-19. They are actively considering how to lock in the positive travel behaviour changes arising from the Covid-19 pandemic, and the UKCCC advice on making it easy for people to walk, cycle and work remotely will be central to delivering the recast Climate Change Plan update and a green recovery.

The design of the transport system will be so that walking, cycling and public and shared transport take precedence ahead of private car use. More specifically, the following policies and interventions have been put in place in the Programme for Government:

- Rail Decarbonisation Plan (July 2020) set out the pathway to a net-zero railway by 2035.
  - Removing the need for new petrol and diesel cars and vans by 2032.
  - Phasing out petrol and diesel cars in Scotland's public sector fleet by 2025, and the need for all new petrol or diesel vehicles by 2030.
  - Enabling the decarbonisation of scheduled flights within Scotland by 2040, and support trials of electric aircraft within the next 2 years.
  - Measures in the Transport (Scotland) Act 2019 support emissions reduction in transport through encouraging modal shift, including an improved framework for bus services, Low Emission Zones (LEZ) and the Workplace Parking Levy.
  - Approval of net additional spend of £487 million in a range of measures to support the public transport sector through the COVID crisis.
  - Long-term commitment to invest over £500 million on bus priority infrastructure to tackle bus congestion issues.
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- The Active Travel budget is over £100 million for 2020-21. This investment will enable the continued delivery of high-quality walking, cycling and wheeling infrastructure, enabling more people to choose to walk and cycle for shorter everyday journeys or as part of a longer multi-modal journey.

Thanks to the above, the organisation will play a key part in interacting with the Off-grid Communities in striving to reduce emissions from transport to and from the island communities.

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### **NatureScot**

NatureScot (formerly Scottish Natural Heritage) are Scotland's nature agency with 30 years' experience advising the Scottish Government. The organisation works to improve the natural environment in Scotland and inspire everyone to care more about it. The key is to ensure all nature in Scotland – the key habitats and landscapes, all green space and native species – is maintained, enhanced and brings Scottish citizens benefits.

NatureScot are also working towards Scotland's 'green recovery' from Covid-19. A 'green recovery' to NatureScot involves stimulating a revival that secures resilience through a nature-rich future for Scotland and an effective response to the climate emergency. This means that by 2030, Scotland will be recognised as a world leader in looking after and enhancing nature. NatureScot believes that a nature-rich future, where everyone is involved, will make us all happier, healthier, wealthier and more equal.

NatureScot own most of the land on Rum, as well as their energy generating and distribution system. They are also responsible for the designated sites on the Fair Isle, Canna, Muck, Eigg, Knoydart and Foula. The organisation is therefore integral to the Transition Agenda for all these islands as no development is possible without consulting NatureScot.

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### *Public Sector Economic Activities*

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### **Highlands and Islands Enterprise**

Highlands and Islands Enterprise (HIE) is Scottish Government's regional development agency for the north and west of Scotland. Its remit integrates economic and community development. The region is diverse and extends from Shetland to Argyll, and from the Outer Hebrides to Moray, covering more than half of Scotland's land mass. Supporting island communities is one of HIE's important activities.

HIE provides direct support to businesses and communities throughout the region; working closely with them to develop new opportunities and to improve their performance and sustainability. HIE has direct account management relationships with hundreds of businesses and communities across the region, as well as in house energy sector specialists and strong links with partner organisations.

HIE currently works in close collaboration with the island communities, especially those who are currently not connected to the mainland grid (Canna, Eigg, Fair Isle, Foula, Muck, Rum and Knoydart) to improve understanding of their unique energy challenges and to identify routes to sustainable solutions.

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Throughout 2018, HIE worked with Ricardo Energy & Environment, an independent environmental consultancy, to complete a significant piece of work in the form of an energy audit, covering 50 Scottish Islands. The primary goal of the audit was to increase awareness of the energy status of islands so that policy support could be established to assist islands in their sustainable transitions. The audit covered power, heat, transport, communications and transport and the interlinkage of these to fuel poverty and island resilience. The audit also provided a means to further classify islands in terms of energy supply and connectivity. In addition to this work, HIE have funded a project to develop financial models for Off Grid Energy Systems, and seek advice relating to the financial sustainability of, and any longer-term financing options for, said Off Grid Energy Systems. This project is still on-going but will act as a support tool for the Off-grid Communities in their pathways to reaching their decarbonisation goals.

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### **Wave Energy Scotland**

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Wave Energy Scotland (WES) is driving the search for innovative solutions to the technical challenges facing the wave energy sector. They support a range of projects focused on the key systems and sub-systems of Wave Energy Converters. The aim is to produce reliable technology which will result in cost effective wave energy generation.

WES was formed in 2014 at the request of the Scottish Government and is a subsidiary of Highlands and Islands Enterprise. The aim of WES is to ensure that Scotland maintains a leading role in the development of marine energy. The Off-grid Communities of Scotland present an excellent opportunity for collaboration and testing of off-grid systems. WES are keen to engage with the Communities to explore options for how the organisation can assist the Communities with their decarbonisation efforts.

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### **Schools and Academia**

*Higher Education and Research*

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#### **Strathclyde University**

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Strathclyde University have been involved as a stakeholder to provide support for the Off-grid communities forum. Most notably via a member of their Department of Electronic and Electrical Engineering. The Electronic and Electrical Engineering Department of Strathclyde University ranks as No. 1 in Scotland electrical engineering. More specifically, its programme provides research to help deliver sustainable clean energy, revolutionising internet security, and develop smart devices to aid remote monitoring.

The representatives collaborating with the Off-grid Communities lead several research groups at the University, including Novel Electrical Systems and Data Analytics. This research is concerned with multi-domain modelling of aircraft, marine and micro-grid applications, including the data analytics related to smart energy, smart grid and behavioural change. Additional expertise within the Team centres around:

- Applied mathematical optimisation
  - Novel electrical systems
  - Electrical demand characterisation
  - Data analytics
  - Social and behavioural aspects of energy
  - Smart sustainable communities
  - Low and zero carbon technologies
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- Integration of Storage in Low Carbon Buildings and Districts
  - Design support, performance analysis, modelling, monitoring and POE
  - Energy systems

This experience and knowledge will provide excellent support to the Off-grid Communities as they develop the details of how the strategy will be implemented on each island.

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### **University of the Highlands and Islands**

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Universities have an important role to play in the Clean Energy Transition. In the Highlands and Islands region there is an indigenous University – University of the Highlands and Islands (along with other institutions) with a growing expertise across the renewables and low carbon technologies sector. The Quadruple Helix Model of Open Innovation used in the region is a multidisciplinary approach to tackling complex problems through seeking the views of Academics (University of the Highlands and Islands - UHI), Business (Highlands and Islands Enterprise), Civil Society (islanders) and Local Authorities (Highland Council). In this way, different viewpoints, ideas and ultimate solutions may be better understood through such a network, leading to more appropriate, long-term solutions to common problems.

The University of the Highlands and Islands is affiliated with RETI (Réseau d'Excellence des Territoires Insulaires), an International network of island universities with a common interest in island issues, and their involvement will be valuable throughout the process.

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### **Energy Technology Partnership (ETP)**

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ETP is the Scottish academic research pool in energy, an autonomous alliance of 13 independent Scottish Higher Education Institutions, each with areas of outstanding research capability in the energy sector, providing world-class capability and resources in energy RD&D, supported and co-funded by the Scottish Funding Council. It creates value for the Scottish economy by acting as a broker between academia and external organisations and industry, promoting and disseminating ETP's mission to translate excellent research into economic impact through the following:

- Contributing to a Scottish world-leading research base that is internationally competitive and strengthening its global reputation and standing.
- Creating economic Impact for the Scottish economy and society through communication, conferences, seminars, workshops, special interest groups, and knowledge exchange activity.
- Supporting the energy sector with the skills it needs, primarily through PhD programmes.

ETP's vision is to build on the existing areas of excellence and collaborative working to ensure that Scotland remains a globally competitive driving force in energy research & innovation. Key ETP objectives are to strengthen collaboration and cohesion in energy research, development and training across its partner institutions, maximise knowledge exchange with industry, and translate academic excellence into economic impact.

ETP has 11 energy themes, which enable it to focus on areas of particular academic strength and has considerable energy RD&D capability and key research strengths across a wide spectrum of energy technologies. Examples include:

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- Bioenergy
  - Energy Systems
  - Energy Conversion and Storage
  - Energy Efficiency in Buildings
  - Heat Energy
  - Marine Energy
  - Energy Distribution & Infrastructure
  - Wind Energy
  - Solar PV
  - Oil and Gas
  - Carbon Capture and Storage
  - Economics, Policy, People, & Society

Previously, the ETP was in a partnership with Scottish Enterprise and Scottish Renewables representing Scotland's academic, public and industry interests in ENSEA (North Sea Energy Alliance).

The ETP presents a fantastic opportunity for the Off-grid Communities to engage with academia on themes that will help make their energy provision more robust and sustainable, as well as systems to assist with their decarbonisation.

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### **Heriot Watt University**

The School of Energy, Geoscience, Infrastructure and Society (EGIS) is one of the UK's leading institutions for multidisciplinary research and teaching in areas critical to economic development and societal equity. EGIS has six institutes completing various research to improve economic development and social equity. These institutes carry out work in the fields that are relevant to industry and society, including topical issues such as:

- Carbon capture and storage
- Flood risk management
- Health research
- High speed rail
- Housing markets
- Low carbon buildings
- Marine and coastal research
- Petroleum engineering and geoscience
- Policy, poverty and social exclusion

More specifically, staff of the EGIS department with specific expertise in Sustainable Energy, Demand Management, Energy Forecasting have liaised with the Off-grid Communities to provide support in their Transition Agenda.

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### **Power Networks Demonstration Centre (PNDC)**

The PNDC is a venture founded by government, industrial and academic partners with the aim of accelerating the adoption of innovative research and technologies from early stage research into business as usual adoption by the electricity industry.

Building the next generation of energy networks requires collaboration and the PNDC connects stakeholders through every stage of the innovation process. The unique facility enables highly realistic and accelerated technology testing alongside a rich portfolio of

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research programmes across the full Smart Grid domain. The capabilities of the organisation include:

- Real 11kV and LV distribution networks, which are flexible with the ability to vary voltage, frequency and perform disturbance testing in a controlled environment.
- A team of post doctorate researchers with individual areas of expertise relevant to our Core Research Themes.
- The capability to research, test and demonstrate hardware, software and integrated systems solutions in a safe, controlled environment

The PNDC has been in discussion with several of the Off-grid communities about testing their existing system and modelling impact and changes to their respective distribution system to accommodate the decarbonisation pathways.

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## 4. Policy and Regulation

A review on how the transition process on the Off-grid Communities is embedded in the policy and regulations from other levels of governance allows to identify the political top-down drivers that can push the transition. Unfortunately, the vast majority of regional policies and regulations are currently under review. This is because most of them span up to and including 2020 but they are also being reviewed in response to the Scottish Government's decision to pass the Climate Change (Emissions Reduction Targets) (Scotland) Act in 2019.

### Local policy and regulation

The local governance structure in Scotland is such that there is no devolved governance for the Small Isles and the individual islands of Shetland. These communities exist as Wards within their respective regional Local Authority (Highland Council and Shetland Council. See section 3). The Local Authorities have produced Local Development Plans, but these extend over large areas, albeit, they have sections within them that specifically focus on the islands/communities in question. For example:

- The Small Isles and Knoydart are covered by the West Highland and Islands Local Development Plan (abbreviated to WestPlan) which was ratified in 2019. This, along with the Highland-wide Local Development Plan (HwLDP) and Supplementary Guidance, forms "the development plan" that guides future development in the Highlands.
- The Shetland Islands Local Development Plan covers all the islands and is split into 7 'localities.'

Please see the next section for more details on these Plans.

### Regional policy and regulation

#### **Shetland Council**

The [Shetland Islands Local Development Plan](#) (referred to as 'the Plan') was produced in 2014 and sets out a Vision and Spatial Strategy for the development of land in the Shetland Islands over the next 10-20 years. The General Policies of the Plan focusses on Sustainable Development and tackling climate change and associated risks. In addition, all new buildings shall avoid a specified and rising proportion of the projected greenhouse gas

emissions from their use, through the installation and operation of low and zero-carbon generating technologies (LZCGT). Through this Plan, the Council commits to comply with legal requirements and national policies on Energy Efficiency and Climate Change (Emissions Reduction Targets).

In March 2011 the Shetland Islands Council approved a governance structure for a Carbon Reduction Strategy with the aim of achieving the national carbon reduction targets. This will:

- maintain momentum and effectively coordinate and monitor progress across services
- report regularly to the Corporate Management Team and to Committee
- deliver an awareness raising and support programme for all services from June 2011

To assist the Council to implement the Strategy, a [Carbon Management Plan](#) (CMP) was produced. This aims to reduce emissions from the Council's fleet, buildings, street lighting and other facilities. It prioritises actions that reduce their carbon footprint with the added benefit of cutting costs (in most cases), while not reducing the quality of service delivery. The main purpose of the CMP is to:

- Define the carbon emissions baseline and provide detailed projections for future emissions;
- Provide a 5-year implementation plan for achieving the desired reduction target
- Confirm funding, ownership and responsibility for delivery
- Outline project governance requirements
- Plan stakeholder management and communications to continue to secure support and encourage culture change.

The Council also provides Local Energy Efficiency Grants as well as links to National Energy Efficiency Grants and Loans to assist residents and business in reducing their carbon emissions.

### **Highland Council**

The [WestPlan](#) outlines a commitment for resources to be managed to ensure water, heat sources, land and buildings are used, sited and designed in a way that is carbon clever, and that waste is reduced, reused, recycled or treated as close to source as possible to generate renewable energy. The Plan suggests development sites and uses that can maximise energy efficiency.

In 2012, the HC published [Adapting to Climate Change in Highland](#). The programme incorporated research undertaken across the Highlands, along with the views of local communities, to help highlight the main issues and priorities for the region Highland Council in response to climate change. One of the responses was to develop a Climate Change Working Group (CCWG). This exists as a consultative forum to provide advice and directional guidance on the climate, ecological and environmental sustainability agenda across The Highland Council's estate, including its schools, non-domestic properties, services, and other areas within its realm of wider influence, as well as to support efforts to reduce emissions across the wider Highland area. The CCWG has the following specific functions:

- To support and champion Highland's high-quality environment, biodiversity, air, land, water, food products and renewable energy resources to bring appropriate commercial opportunities, maximise income whilst raising awareness of the need to protect and enhance our critical environmental assets.

- To be updated on the legislative, regulatory, policy and practice issues in relation to climate change, sustainability and biodiversity issues which impact The Highland Council, by Council officers and key partners.
- To consider the development of a revised Carbon CLEVER vision for climate and ecological action that moves the Council's agenda beyond risk-based compliance towards a more truly low-carbon Council.
- To propose new actions to achieve net zero by 2025, drawing out budgetary and other resource implications for the Council and wider Highland region.
- To receive, scrutinise and comment on a new Climate Change Plan for The Highland Council.
- To receive, scrutinise and comment on a new Energy Strategy & Action Plan for The Highland Council.
- To scrutinise and comment on the work being progressed under the respective remits of the Energy & Renewables and Staff Travel Project Boards.
- To consider and comment on responses to the Scottish Government and other relevant bodies regarding climate and ecological issues, including statutory reporting under Scotland's Public Bodies Climate Change Duties.
- To consider how best to promote awareness of the need for climate and ecological action within the Council and amongst partner organisations including Community Planning Partners, the Highland Environment Forum, and where appropriate, the wider community in Highland.
- To identify, support and champion climate and ecological progress across the Council whilst providing an appropriate level of critical challenge for the organisation.
- To take evidence and consider specific Highland issues, for example, electrical grid constraints, which impact the Council's low carbon ambitions.
- To consider and make recommendations to The Highland Council and / or any other appropriate strategic committee in relation to these matters, including any proposed changes or developments to Highland Council policy & strategy.

The Council also offers Energy Efficiency advice via the Energy Efficient Scotland programme. The aim of this is to improve the quality and condition of properties in the Highlands by providing free and impartial advice for domestic and commercial buildings. This service provides an Area Based Scheme which implements [the Energy Company Obligation Flexible Eligibility](#) (hereafter referred to as ECO Flex). This allows local authorities to tackle fuel poverty and householders vulnerable to the effects of living in cold homes by working with energy suppliers to access ECO funding.

In June 2020, the HC issued a Statement of Intent in relation to this scheme and how it plans to implement it. This programme will be focused across the Highlands in conjunction with the Energy Efficiency Scotland area-based programme. Where possible this scheme will aim to blend both ECO and Energy Efficient Scotland funding streams to positively impact on carbon emissions. Finally, in May 2019 the Council declared a climate and ecological emergency and recommitted to achieving a carbon neutral region by 2025.

## National policy and regulation

The Scottish Government have produced several policies and regulations that aim to assist organisations and communities to decarbonise. These are listed below, in no particular order:

## Scottish Energy Strategy

The [Scottish Energy Strategy](#) was published in 2017 and outlines the Vision for Energy in Scotland. This Vision specifically focusses on delivering a flourishing, competitive local and national energy sector, delivering secure, affordable, clean energy for Scotland's households, communities and businesses. The Strategy acts to guide the decisions that the Scottish Government, working with partner organisations, needs to make over the coming decades. The vision remains guided by three core principles:

- a whole-system view
- an inclusive energy transition
- a smarter local energy model

The energy system described in the Strategy will create economic opportunities for both suppliers and consumers of energy, as well as address the impact of poor energy provision. It states that a diverse, well-balanced energy supply portfolio or 'energy mix' will remain essential to support the decarbonisation of heat, transport and electricity systems.

The Strategy proposes a smarter, more coordinated, approach to planning and meeting distinct local energy needs. This will link with developments at the national scale, creating a flexible and proportionate response to the challenges raised by the transformation of Scotland's energy system. The Government recognises that supporting and delivering local solutions to meet local needs, linking local generation and use, can help create vibrant local energy economies.

The Strategy recognises the requirement to transition to a low carbon economy over the coming decades in a way that tackles inequality and poverty and promotes a fair and inclusive jobs market. One of the methods for achieving this is by establishing a Just Transition Commission to advise Scottish Ministers.

The principle of an inclusive energy transition will be further supported by the ambition to establish a new energy company. The aim is that this company will support economic development and contribute to tackling fuel poverty, as well as being publicly owned and run on a not-for-profit basis.

### ***Climate Change (Emissions Reduction Targets) (Scotland) Act***

The [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act](#) was passed by Parliament in September 2019. This act amends the Climate Change (Scotland) Act 2009 to make provision for setting targets for the reduction of greenhouse gases emissions, and to make provision about advice, plans and reports in relation to those targets, with the objective of Scotland contributing appropriately to the world's efforts to deliver on the Paris Agreement reached at the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change.

The Act states that Scottish Ministers must ensure that the net Scottish emissions that account for the net-zero emissions target year is at least 100% lower than the baseline (the target is known as the "net-zero emissions target"). The "net-zero emissions target year" is 2045 and the baseline is referenced as 1990 levels of carbon dioxide, methane and nitrous oxide and 1995 levels of hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.

The Act also outlines specific interim targets which places a requirement on Scottish Ministers to ensure that the net Scottish emissions account are as follows:

- 2020 is at least 56% lower than the baseline,
- 2030 is at least 75% lower than the baseline, and
- 2040 is at least 90% lower than the baseline.

The methodology for achieving these interim targets is outlined in the [Climate change plan](#). The current Plan is the third report on proposals and policies for meeting its climate change targets. It sets out how Scotland can deliver a target of 66% emissions reductions, relative to the baseline, for the period 2018–2032. The Plan targets specific sectors, such as:

- energy supply,
- transport (including international aviation and shipping),
- business and industrial process,
- residential and public (in relation to buildings in those sectors),
- waste management,
- land use, land use change and forestry,
- agriculture.

### **Local Energy Policy Statement**

Another action in response to Scotland's Energy Strategy was to develop "innovative local energy systems." To support that aim, a commitment was made to develop a Local Energy Position Paper, which would set out a series of key principles and associated outcomes for a broad range of stakeholders to consider during the development of future local energy projects. A public consultation, shaped by an external steering group (co-chaired by the Scottish Government and comprised of representatives from industry, communities and other relevant bodies) and a series of external stakeholder workshops, ran from 9 October 2019 to 4 December 2019 to seek views on a range of issues.

The starting position was that this document would not be providing specific project guidance or delivery models – nor will it mandate any actions to be undertaken by any party. Instead, it will provide key principles that, if adopted during the development of future local energy projects, will deliver the fair and inclusive outcomes Scotland wants. Responses to the consultation will be used to inform the final version of the Policy Statement. A date for its publication has not yet been announced.

### **National Islands Plan**

The Scottish Government produced the [Islands \(Scotland\) Act](#) in 2018. This Act introduces a number of measures to underpin the Scottish Government's objective of ensuring that there is a sustained focus across government and the public sector to meet the needs of island communities now and in the future with the aim of improving outcomes for island communities. In particular, it aims to:

- make provision for a National Islands Plan;
- impose duties in relation to island communities on certain public authorities;
- make provision about the electoral representation of island communities; and
- establish a licensing scheme in respect of marine development adjacent to islands.

In December 2019 the first five year [National Islands Plan](#) was published with the promise of improving island governance and policy in Scotland. The Islands Act requires the Plan to set out the main objectives and strategy of Scottish Ministers in relation to improving outcomes for island communities that result from, or are contributed to by, the carrying out of functions



of a public nature. Development of the Plan will be guided by the legislation, by the experience and expertise of partner agencies and is informed by wider Scottish Government policy and strategy.

The Plan includes proposals in relation to:

- increasing population levels
- improving and promoting sustainable economic development
- improving and promoting environmental wellbeing
- improving and promoting health and wellbeing
- improving and promoting community empowerment
- improving transport services
- improving digital connectivity
- reducing fuel poverty
- ensuring effective management of the Scottish Crown Estate
- enhancing biosecurity

It also includes other issues that are important to island communities: housing, climate change, energy, education and our cultural heritage. The next step will be to develop an Implementation Route Map detailing these actions, measures and indicators.

### **Heat Policy Statement**

The Scottish Government developed a [Heat Policy Statement](#) titled "Towards Decarbonising Heat: Maximising the Opportunities for Scotland" in June 2015. This Heat Policy Statement sets out the Scottish Government's future policy direction for addressing the three key aspects of the Heat system:

- how we use it (heat demand and its reduction)
- how we distribute and store it (heat networks and heat storage)
- where our heat comes from (heat generation)

Each of these aspects of the heat system is addressed by three specific objectives as set out in our Heat Hierarchy:

- reducing the need for heat;
- supplying heat efficiently and at least cost to consumers;
- and using renewable and low carbon heat.

The Heat Policy Statement sets out the actions being taken by the Scottish Government with its partners to tackle these challenges. The specific targets and methods for achieving these will not be listed here as most of them have been superseded by policies and regulation implemented, or currently being developed, since the ratification of the Climate Change (Emissions Reduction Targets) (Scotland) Act.

### **Heat Networks (Scotland) Bill**

The above-mentioned Heat Policy Statement is slightly outdated when considering the Climate Change (Emissions Reduction Targets) Act and the Scottish Government has introduced a new Bill on the subject. The Bill is for an Act of the Scottish Parliament to make provision for regulating the supply of thermal energy by a heat network, and for regulating the construction and operation of a heat network. It also aims to make provision about the powers of persons holding a heat networks licence; to make provision about conferring rights



in heat network assets where a person ceases operating a heat network; and for connected purposes.

It is planned for the Bill to also contribute to Scotland's target to deliver 11% of non-electrical heat demand from renewable sources by 2020 and the Scottish Government's target that 50% of all energy consumption come from renewables by 2030.

### **Energy efficiency policy**

The Scottish Government made energy efficiency a national infrastructure priority in 2015. This was in recognition of the many benefits of improving the energy performance of Scotland's buildings. In response to this they developed the [Energy Efficient Scotland programme](#) which included an [Energy Efficiency Route Map](#) published in 2018.

Through the programme and Map the Scottish Government are taking direct and supporting actions to improve the use and management of energy in Scotland's buildings, transportation, industrial processes and manufacturing. This is being achieved by:

- improving energy efficiency in homes
- improving energy efficiency in non-domestic buildings
- delivering the Energy Efficient Scotland programme to improve energy efficiency across Scotland
- establishing quality assurance requirements to protect consumers and support the supply chain
- supporting industrial energy efficiency
- decarbonising heat to help tackle climate change

The Energy Efficiency Programme places a renewed emphasis on managing energy consumption in Scotland more effectively and underlines the economic benefits of energy efficiency investment. The Programme outlined a transition plan for achieving its aims and objectives. In year 1 (2018) this included continued allocation of funding for fuel poverty programmes; funding to support the development of the Local Heat & Energy Efficiency Strategies (LHEES); and funding for local authorities to offer end-to-end support for energy efficiency in domestic and non-domestic able to pay markets. In year two (2019) the programme integrated the funding streams to facilitate local authorities developing action plans to use as evidence for securing related funding.

The LHEES place a statutory duty on local authorities to develop plans and links national long-term targets and policies to the delivery of energy efficiency, reducing energy demand and heat decarbonisation.

From 2020, Energy Efficient Scotland will support building owners to reach required energy ratings with the aim that by 2035 most buildings will have reached the energy rating. The long-term plan is that by 2040 Scotland's buildings will be energy efficient and Scotland's people will be better off.

### **European policy and regulation**

#### *Energy and climate actions*

Energy is one of several shared competences between the European Union (EU) and the Member States. EU policy is currently based on three pillars (known as the "energy trilemma"):

- Competition;
- Sustainability;
- Security of supply

Through policy and regulation, the EU promotes the interconnection of energy networks and energy efficiency. It deals with energy sources ranging from fossil fuels, through nuclear power, to renewables (solar, wind, biomass, geothermal, hydro-electric and tidal). Three legislative packages were adopted to harmonise and liberalise the internal European energy market between 1996 and 2009. These addressed issues of market access, transparency and regulation, consumer protection, supporting interconnection, and adequate levels of supply.

For a while now, the EU is actively promoting Europe's transition to a low-carbon society and is regularly updating its rules to facilitate the necessary private and public investment in the clean energy transition.

A variety of measures aiming to achieve an integrated energy market, the security of energy supply and a sustainable energy sector are at the core of the EU's energy policy:

- Renewables Directive: mandatory targets, national plans grid rules...
- Emission Trading Scheme (ETS), reflecting a carbon price to achieve the cap.
- Energy Union: secure, sustainable, competitive and affordable energy
- 3rd energy package: unbundling, harmonised grid operation rules, network codes etc.
- Energy Efficiency Measures
- Institutional measures: ENTSOs, ACER, CEER...
- Development of the longer-term framework: 2020, 2030, 2050

*Latest EU legislation on energy environment and climate*

On **11 December 2019**, the European Commission presented its Communication '[The European Green Deal](#)<sup>3</sup>,' setting a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.



Figure 4 - Clean energy targets Green Deal<sup>4</sup>

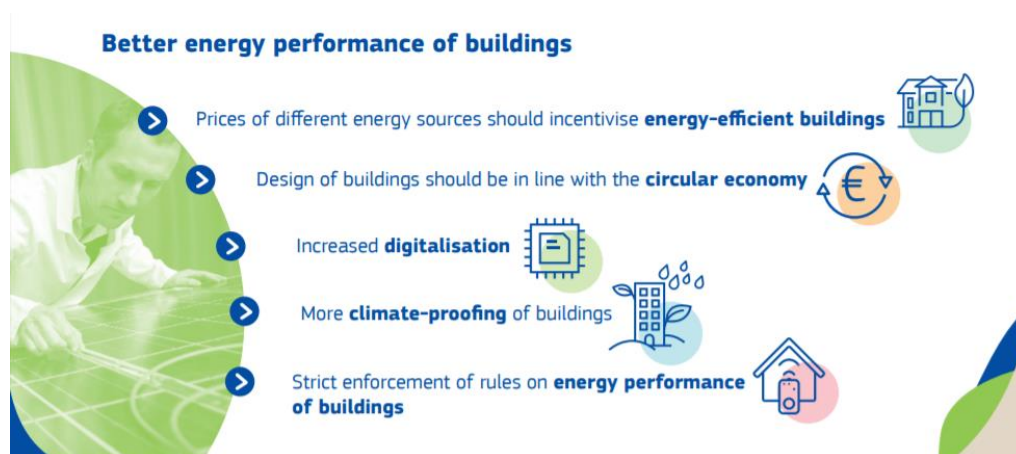


Figure 5 - Building and Renovation targets Green Deal<sup>5</sup>

## Europe must reduce emissions from transport further and faster.

Transport accounts for a quarter of the Union's greenhouse gas emissions and these continue to grow. The Green Deal seeks a **90%** reduction in these emissions by **2050**.

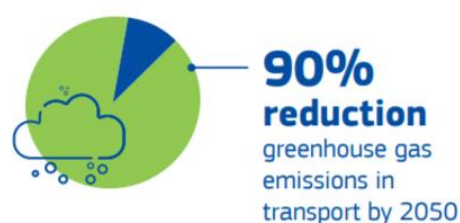


Figure 6 - Sustainable mobility targets Green deal<sup>6</sup>

The Commission stated that the European Green Deal will reflect this growth strategy in its long-term vision for rural areas. It will pay particular attention to the role of outermost regions in the European Green Deal, considering their vulnerability to climate change and natural disasters and their unique assets: biodiversity and renewable energy sources. The Commission will take forward the work on the Clean Energy for EU Islands Initiative to develop a long-term framework to accelerate the clean energy transition on all EU islands.

On the 4th of March 2020 the European Commission unveiled the **European Climate Law**<sup>7</sup> proposal aiming at cutting greenhouse gas emissions to zero by 2050 and making it legally-binding for all member states. The European Commission is proposing a mechanism for regularly raising the EU's emissions reduction target over the next three decades. By September 2020, the Commission shall review the Union's 2030 target for climate in light of the climate-neutrality objective and explore options for a new 2030 target of 50 to 55% emission reductions compared to 1990. The European Commission stressed that she will engage with all parts of society to enable and empower them to act towards a climate-neutral and climate-resilient society, including through launching a European Climate Pact.

On 30 November 2016, the European Commission published its so-called "Winter Package" with eight proposals to facilitate the transition to a "clean energy economy" and to reform the design and functioning of the European Union's electricity market. This package of proposals can be divided into three categories:

- proposals to amend the existing energy market legislation;
- proposals to amend the existing climate change legislation;

- proposals for new measures.

In the autumn of 2018 and spring of 2019, several directives were adopted under the **Clean Energy for all Europeans Package**. The eight legislation measures can be placed in four groupings:

1. Energy Efficiency:
  - The Energy Efficiency Directive; and
  - The Energy Performance in Buildings Directive
2. Internal Energy Market Reform:
  - The Internal Electricity Market Design Regulation;
  - The Internal Electricity Market Design Directive;
  - The Agency for the Cooperation of Energy Regulators (ACER) Regulation; and
  - The Risk Preparedness in the Electricity Sector Regulation.
3. Renewable Energy:
  - The Renewable Energy Directive;
4. Governance:
  - The Governance of the Energy Union and Climate Action Regulation.

These new Electricity Market Design (EMD) rules make the energy market fit for the future and place the consumer at the centre of the clean energy transition. The new rules are designed to empower energy consumers to play an active role in driving the energy transition and to fully benefit from a less centralised, and more digitalised and sustainable energy system. The new rules enable the active participation of consumers whilst putting in place a strong framework for consumer protection.

## The Clean Energy Package

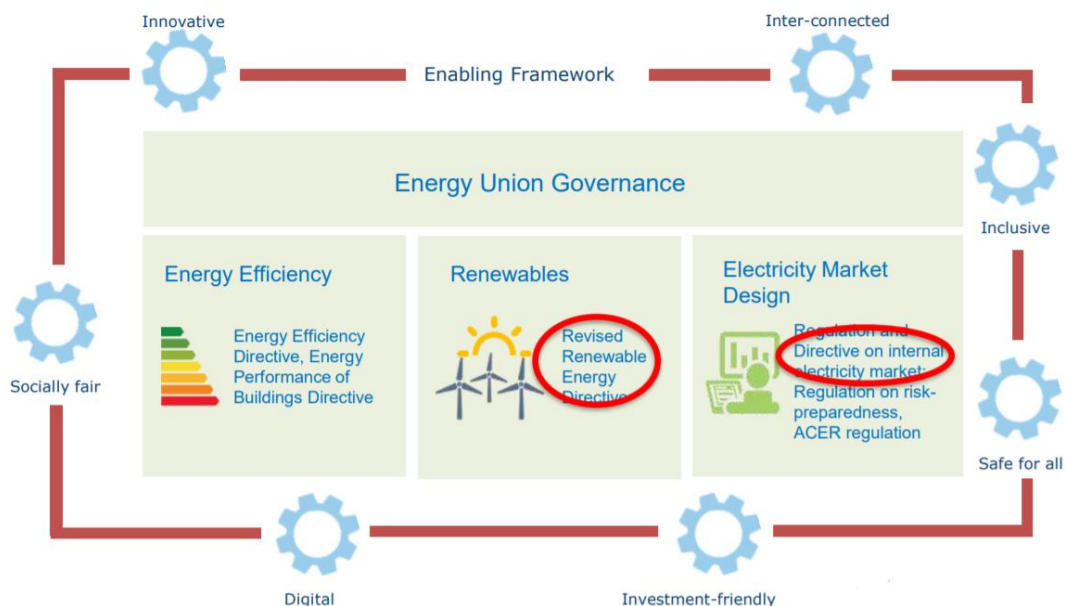


Figure 7 - Structure of the CEP<sup>8</sup>

### Energy Communities

For EU Islands the most important new rules are those that empower citizens and small producers under the new concept of **Renewable (REDII) or Citizens (EMD) Energy Communities**. These are groups of citizens, social entrepreneurs, public authorities and community organisations participating directly in the energy transition by jointly investing in, producing, selling and distributing renewable energy.

#### What?

- Generation of energy from renewable resources and technologies, which are partly or wholly owned by local communities

#### Who?

- Groups of citizens, social entrepreneurs, public authorities and community organisations participating directly in the energy transition by jointly investing in, producing, selling and distributing renewable energy

#### What can they do?

- Produce, consume, store and sell renewable energy, including through renewable power purchase agreements;
- Share, within the renewable energy community, renewable energy that is produced by the production units owned by that renewable energy community;
- Access all suitable energy markets both directly or through aggregation in a non-discriminatory manner

It is noticed throughout the EU that the participation of local citizens and local authorities in renewable energy projects through renewable energy communities has resulted in substantial added value in terms of local acceptance of renewable energy and access to additional private capital which results in local investment, more choice for consumers and greater participation by citizens in the energy transition. Therefore, the RED II and the EMD state that the Member States should ensure that renewable energy communities can participate in available support schemes on an equal footing with large participants. To that end, Member States should be allowed to take measures, such as providing information, providing technical and financial support, reducing administrative requirements, including community-focused bidding criteria, creating tailored bidding windows for renewable energy communities, or allowing renewable energy communities.

It is up to the Member States to set the fees and tariffs to be borne by the CEC. They can allow the CEC to be a distribution system operator (DSO) or a closed distribution system operator (CDS), and they must facilitate the roll-out of RECs by removing market barriers and taking account of RECs in support mechanisms.

## Part II: Island Transition Path

### 1. Vision

The Scottish Off-grid Communities' vision for the future is to work together as a collection of communities to deliver a decarbonisation agenda that provides an affordable, resilient low carbon energy supply for all residents. The main strategic objective of the Collaborative is to create resilient energy generation and supply systems that will secure the current and future energy needs of the various communities via renewable energy generation. This objective will naturally lead to low carbon solutions for electricity and heat.

### 2. Transition Governance

The governance of the clean energy transition of the Scottish Off-grid communities is shared between different organisations and stakeholders. However, the path of the transition will be driven and administered by the Transition Team with support from the various stakeholders. The mandate of the Transition Team (also known as the Off-grid Energy Collaboration Forum) is to provide an independent platform that is facilitated by Highlands and Islands Enterprise with detailed input from, and collaboration with, the various renewable energy trading arms of the respective Community Trust/Association. More specifically, the Team includes the following organisations:

- Highlands and Islands Enterprise
- Isle of Eigg Heritage Trust
- Eigg Electric Ltd
- Isle of Rum Community Trust
- Canna Renewable Energy and Electrification Ltd
- Isle of Muck Power Ltd
- Fair Isle Electricity Company Ltd
- Foula Electricity Trust
- Knoydart Renewables Ltd
- Knoydart Foundation

The main stakeholders for achieving the Transition Agenda are the individual Community Trusts/Associations and their respective trading organisations. These organisations are all companies Limited by Guarantee and owned by the residents of each respective island community. Their main objective for the Transition Agenda is to decarbonise their respective off-grid community and make them carbon neutral with a resilient electricity supply and distribution system. The Trusts and trading organisations will be responsible for community engagement and any public consultation.

The Transition Team is a vehicle for community engagement within these Off-grid Communities and acts as a facilitator in the communities' clean energy transition. It represents the views of all islanders involved in the clean energy transition and provides a platform for the stakeholders to share ideas, experiences, plans etc. The Team also aims to help develop a coordinated approach to maintenance and servicing of the off-grid systems. It is believed that a 'strength in numbers' policy will provide the most reliable, robust and sustainable solution to the various systems.

The Transition Team will assist the off-grid communities with (but not limited to) the following:



- Develop island specific plans for decarbonisation.
- Accessing funding for development and capital projects to facilitate decarbonisation and energy security/resilience.
- Improve the energy efficiency of homes and businesses on the islands.

Other key stakeholders involved in the transition process of these Off-grid Communities are the Local Authority and Scottish Government. These organisations are vital to deliver funding opportunities to facilitate the changes. The number of residents and businesses in each community is very small and, therefore, income for the energy generating company is limited. To keep the current and expected future cost per kWh at an affordable level, grant funding is required to support capital investment in the respective systems.

### 3. Pathways

In the past 18 months the Transition Team have met numerous times via virtual meetings, as well as at an Off-grid Communities Conference in December 2019. During these meetings the pathways to achieving the strategic objective (of delivering a resilient and sustainable renewable energy supply to meet all energy demands) have been discussed at length. The proposed pathways are:

- To eliminate the islands' dependence on and use of fossil fuels, in particular, for space and water heating.
- Achieve net zero target for heat by 2025.
- Interact with other communities to illustrate pathways to transition to a sustainable energy future.
- To ensure all houses receive energy efficiency upgrades to a sufficient level for the installation of low carbon systems for space and water heating.
- To start reducing the islands' dependence on fossil fuels for transport.
- Install smart metering and flexibility with a reliable broadband system.

The Transition Pathways for the off-grid communities are visualised in Figure 8.

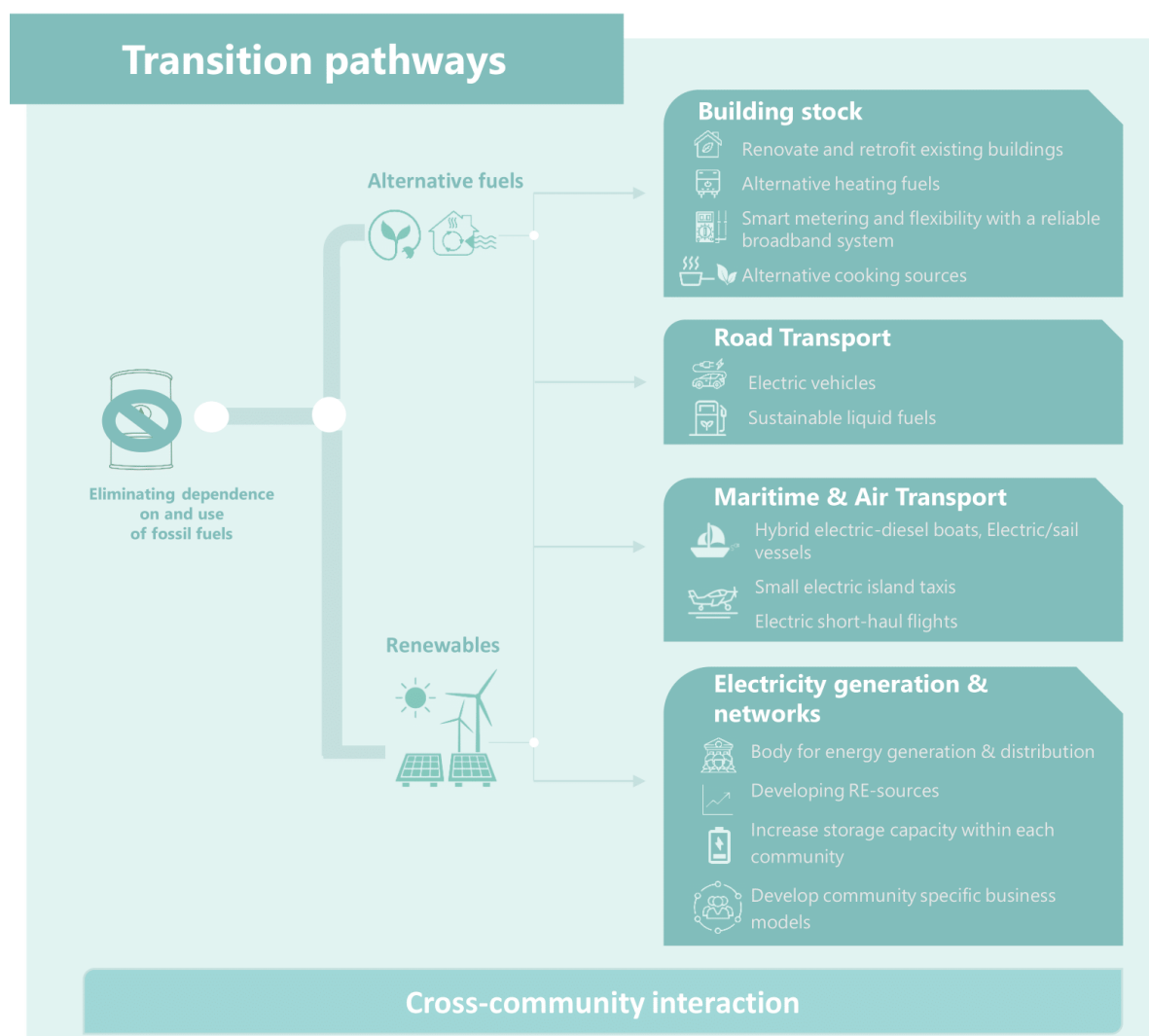


Figure 8 - Transition Pathways present holistic energy scenarios for the off-grid communities and their transition towards complete decarbonisation.



## 4. Pillars of the Energy Transition

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### Pillar: Transport on the island

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#### Objective:

- To decrease the amount of transport fuel imported and used by each community for internal transport by 50% by 2025.
- To increase the percentage of miles travelled by EV on each island by 50% by 2025.

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#### Strategies:

- EVs on each island, to pilot and explore innovation, monitor impact. Does not have to be cars, can be another vehicle type.
- Study feasibility of sustainable liquid fuel.
- Win hearts and minds.

#### Actions:

1. Gather baseline data carbon footprint of end of life car (MOT failures). Clean Energy for EU Islands Secretariat completed a study on *Decarbonising road transport: Off-grid Scottish Islands*. This study is attached (Appendix 2) and illustrates the Life Cycle Assessment of different vehicle types (and origin) when used in an off grid setting on a small Scottish Island.
  2. Get at least 1 EV on each island and work towards improving the percentage of miles driven via electrical power. This can be achieved via vehicles of different types and varieties. For example:
    - Contact private and public agencies with vehicles already on islands (e.g. NatureScot, postal service, NHS Shetland).
    - Seek / encourage interest from residents in private purchase.
    - Encourage any other opportunities that may arise (e.g. Bird Observatory vehicle for Fair Isle; Eigg Electric minibus; Knoydart Taxi)
  3. Investigate and Pilot Innovation associated with EVs. For example:
    - Vehicle to Grid system using vehicle(s) as backup power storage during high demand or power outage (2-way charging device). This can reduce the payback of the vehicle.
    - Solar PV on vehicles.
  4. Communication with residents to sell benefits of an EV.
  5. Complete feasibility study of available resources and/or available land to develop resources for producing on-island sustainable fuel(s).
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## Pillar: Transport to and from the Islands

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### Objective:

- To decrease the amount of transport fuel associated with each community for external transport by 50% by 2025
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### Strategies:

- Seek all opportunities to liaise with and encourage stakeholders involved in transport to and from the Islands to ensure the carbon transition is driving change in provision.
- Win hearts and minds of residents and visitors to encourage them to choose more environmentally beneficial options.

### Actions:

1. Gather baseline data associated with external island transport fuel usage.

2. Marine:

Work in partnership with the Scottish Government (SG), Transport Scotland (TS), Caledonian MacBrayne (CalMac), Shetland Islands & Highland Council and ZetTrans, to develop a show case / prototype system for Scotland, e.g.:

- Ensure new Fair Isle ferry is hybrid,
- Retrofit Foula ferry by replacing lead ballast with batteries,
- Investigate other opportunities such as sail/ electric drive vessels and small isles taxi with electric outboard,
- Encourage CalMac / highland run ferries
- Work with the private sector, such as MOWI, to investigate, and deploy, renewable energy technology for the supply boats, e.g. electric outboards.

The Clean Energy for EU Islands Secretariat completed a study on *Decarbonising Maritime Transport: Off-grid Scottish Islands*. This study is attached (see Appendix 3) and analyses the environmental benefit(s) of retrofitting current vessels into hybrid electric-diesel boats. It identifies alternative fuels and propulsion technologies for ferries and small vessels, and compares the from an economic, environmental and technology point of view.

3. Air

- Liaise with Shetland Islands Council (SIC) and SG to ensure tender documents for new air service to Fair Isle and Foula includes a requirement for the provider to be proactive in decarbonising its service.
  - Liaise with SIC and SG to develop, test and promote electric short-haul flights.
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## Pillar: Heating

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### Objective:

- De-carbonise off-grid island communities' heating.
  - Reduce emissions associated with heating on each Island by 80% by 2025.
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### Strategies:

- Form an appropriately constituted body to be responsible for electricity/energy generation and distribution. Not all communities have such a structure and it is essential to (i) ensure appropriate maintenance and security of supply; (ii) attract appropriate funding; (iii) be the recognised organisation responsible for energy.
- Investigate alternative heating fuels (e.g. wood fuel, Anaerobic Digestion, Hydrogen, Ground Source Heat Pumps etc.) to facilitate the transition to de-carbonising each community. Alternative (available) fuels is part of the transition and offers a potential opportunity to develop small, island-based solutions that are more easily implemented and help in the objective to gradually reduce carbon emissions.
- Renovate and retrofit existing buildings to make them thermally more efficient (increase the energy efficiency of buildings).
- Ensure **all** new developments have heating systems that are compatible with the existing energy network and heat provision on each island.
- Investigate the feasibility and practicalities of installing different heating systems to existing buildings, depending on size of property. E.g. storage heaters with immersion heater in hot water tanks for small domestic dwellings; wet systems with accumulator tanks for medium sized domestic properties (family homes) and small businesses; CHP for larger commercial and public buildings. Whichever system is selected, it is vital these do not require specialists, where possible, to ensure maintenance can be completed using island resources.

### Actions:

1. Seek funding for, and conduct, a collaborative heat technology study which identifies the most appropriate heating technology for the various buildings and systems associated with each Off-grid Island Community. This study should take into consideration the resilience of the system, operation and maintenance requirements, as well as appraise different technologies for different buildings.
  2. Complete energy efficiency surveys of all properties and identify appropriate actions for improvement(s).
  3. Complete an island-wide (community wide) plan for Energy Efficiency improvements of existing stock and develop into a Community Energy Strategy for existing and new stock.
  4. Identify available Scottish Government and Local Authority funding/grant systems to assist with retrofitting existing buildings. Funding/grants to be distributed via the constituted body identified in Strategy.
  5. Investigate opportunity for Isle of Eigg to complete trial with Highland Council.
  6. Identify possible alternative fuel options for each area/community. For example, some areas have trees (wood fuel) while others have grazing animals, breweries etc. (anaerobic digestion).
  7. Ensure appropriate Terms of Supply of electricity and heat.
  8. Establish a system for providing direct (regular) support and advice on technological developments, as well as support for existing systems. I.e. establish a system whereby
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communities can contact an organisation/person for quick and appropriate advice. Communities often develop new ideas that may/may not be suitable or relevant and it would be useful for them to consult an advisor before deciding on whether or not to pursue or amend and then pursue.

9. Investigate feasibility of all properties having Direct Hot Water tanks to provide outlet for peak generation during summer months when heating demand is lower but DHW is still required (for showers, washing etc.).
10. Link with Energy Saving Trust and Home Energy Scotland to provide promotional material/information service to make residents aware of the benefits of changing heating source, and funding available.
11. Acquire funding to train island residents on the installation of various forms of insulation to avoid reliance on/use of external 'approved contractors.'

## Pillar: Cooking

### Objective:

- Decarbonise cooking.
- Reduce volume of fossil fuels used for cooking by 50% by 2025.

### Strategies:

- Develop options for alternative cooking sources. Cooking is very personal, and it has been recognised that several options should be presented to residents.
- Initially target those using higher carbon systems and that the successful transition of those properties may act as examples for others that a) new system is very effective; b) new system is practical, pragmatic and cost effective.

### Actions:

1. Survey and map the communities' requirements and desires for cooking.
2. Identify a few high carbon system users and develop an implementation plan for testing/changing to new system(s).
3. Source funding for new cooking facilities/sources.
4. Develop assessment system to report on pros and cons of system(s) identified in point 2 above.

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## Pillar: Electricity Generation & Networks

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## Objective:

- Ensure all communities generate and distribute sufficient renewable energy throughout the year to provide a reliable and sustainable supply that supports the decarbonisation agenda.

## Strategies:

- Form an appropriately constituted body to be responsible for electricity/energy generation and distribution. (See the 'heating' Pillar.)
- Develop a range of renewable sources to help better balance generation output with demand. Full decarbonisation is expected to require the doubling of current average renewable energy generation capacity.
- Increase storage capacity within each community.
- Develop community specific business models and explore potential new income streams to make the systems sustainable.

## Actions:

1. Model the future demand associated with the decarbonisation of heat, transport and future population growth.
  2. Map new demand in relation to current capacity.
  3. Design and cost generation and network upgrades to meet new demand, if required.
  4. Complete financial models.
  5. Link into new business model.
  6. Pilot potential new technologies.
  7. Investigate new storage systems that can provide electrical and heat storage. This could include, for example, Vehicle to Grid technology and investigating / piloting alternative storage devices to lead acid batteries for electricity; and hot water storage of heat.
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## Pillar: Test and Demonstration of Islands Energy Networks

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## Objective:

- Create opportunities for Off-grid Communities to utilise unique islanded networks to explore new technology to improve energy systems and increase sustainability of the energy generating system.

## Strategies:

- Make funding organisations, OFGEM etc. aware of unique opportunity presented by Off-grid communities.
- Link with public and private R&D organisations to explore opportunities for testing demonstration workstreams in the Off-grid Communities.
- Utilise R&D and innovative technology opportunities to test/model the resilience of existing networks in each Off-grid Community.

## Actions:

1. Establish working relationship with Innovate UK, PNDC, network operators etc. to determine scope of innovation opportunities within the Off-grid Communities.
  2. Create a system/list with said organisations whereby R&D companies can see the opportunity(ies) available through the Off-grid Communities.
  3. Liaise with PNDC on opportunities for modelling resilience of existing network in light of future demand, and with introducing new technology.
  4. Explore funding for implementing innovative solutions through e.g. CARES, Innovate UK etc.
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## 5. Financing concept

Financing clean energy projects is one of the main challenges when moving from strategy to action. Below a list of financing opportunities is presented that offer feasible options to implement the Transition Agenda for the Off-grid Communities. In general, options to consider for financing include the following, and possibly a mix of all:

- Grant
- Linking government finance options together, e.g. CARES, Council, etc.
- Debt with government underwriting.
- FIT type scheme for Off-Grid.
- Central fund for failure & replacement.

Below a list of financing opportunities is presented that offer possibilities to finance the actions and strategies outlined in this transition agenda.

Financing opportunity	Low Carbon Infrastructure Transition Programme (LCITP).
<b>Description</b>	<p>The LCITP operates in partnership with Scottish Enterprise, Highlands and Islands Enterprise, Scottish Futures Trust and sector specialists. It is a Strategic Intervention supported by the European Structural and Investment Funds, and European match funding for the LCITP is guaranteed up until Autumn 2023. It is overseen by the Low Carbon Infrastructure Transition Programme Board.</p> <p>It aims to support Scotland's transition to a low-carbon economy and provides a range of support, from expert advice to financial support to assist the development and delivery of private, public and community low-carbon projects across the country. Its main focus is assisting projects to develop investment-grade business cases that will help secure public and private capital finance to demonstrate innovative low-carbon technologies in Scotland.</p> <p>The LCITP is designed to create the conditions to attract commercial investment in innovative low-carbon infrastructure projects, which could be replicated elsewhere in Scotland to maximise the potential in the low-carbon sector. It also aims to contribute towards reducing Scotland's greenhouse gas emissions.</p> <p>The Programme regularly issues invitations and at the time of writing there are currently two open invitations <a href="#">Green Recovery: Low Carbon Energy Project Capital Funding invitation</a> and <a href="#">Social Housing Net Zero Heat Fund</a>.</p>
<b>Source of opportunity</b>	Scottish Government.

<b>Financing opportunity</b>	<b>Community and Renewable Energy Scheme (CARES).</b>
<b>Description</b>	<p>CARES aims to support and grow community and local energy projects throughout Scotland, as well as aiming for a considerable increase in the number of shared ownership energy installations across the country.</p> <p>The scheme is delivered on our behalf by Local Energy Scotland, who have a network of development officers based throughout Scotland to provide assistance and guidance to applicants and potential applicants.</p> <p>A host of financial support options are available to applicants, including:</p> <ul style="list-style-type: none"> <li>• Development funding - to complete community engagement activities, feasibility work and options appraisals to develop new local energy projects.</li> <li>• Capital funding - for the capital costs of local energy projects.</li> <li>• Enablement grants – these are available all year round, you don't have to wait for a funding call to apply.</li> </ul>
<b>Source of opportunity</b>	<a href="#">Local Energy Scotland</a>
<b>Financing opportunity</b>	<b><a href="#">Scottish National Investment Bank (SNIB).</a></b>
<b>Description</b>	<p>The Bank will support ambitious companies and important infrastructure projects. By aligning its aims and objectives with Scotland's Economic Strategy, the Bank has the potential to transform and grow Scotland's economy. Work to establish the Scottish National Investment Bank is continuing at pace and it will be operational in the second half of 2020. The Scottish Government has committed to investing £2 billion over 10 years to capitalise the Bank.</p> <p>Taking a mission-based approach, the Bank will aim to support innovative, high growth firms that have a positive impact in Scotland. The Bank's primary mission will be to support Scotland's transition to net zero carbon emissions through a range of debt and equity products.</p>
<b>Source of opportunity</b>	Scottish Government

<b>Financing opportunity</b>	<b>Home Energy Scotland/Energy Savings Trust.</b>
<b>Description</b>	<p>There are two types of financing opportunities through Home Energy Scotland, <a href="#">Grant and Loan</a>. These are focussed around Home Energy Efficiency and Green Transport but also cover renewable energy systems, energy storage and connections to an approved district heating scheme. In addition, cashback grants are available for a limited time for certain energy efficiency improvements.</p> <p>They are set up to help homeowners and private sector landlords make energy and money-saving improvements to their homes/buildings.</p>
<b>Source of opportunity</b>	Scottish Government
<b>Financing opportunity</b>	<b>Local Authority Area Based Schemes.</b>
<b>Description</b>	<p>The area-based schemes are designed and delivered by councils with local delivery partners. The Scottish Government has awarded funding to Highland Council and Shetland Islands Council to deliver energy efficiency programmes in their areas as part of the Energy Efficient Scotland: Area Based Scheme (EES:ABS).</p> <p>Under the schemes, individuals may be eligible to receive support if certain criteria are met. The schemes are typically geographically based (focussing on areas with high levels of fuel poverty) and may entitle residents to energy efficiency measures. The funding is blended with Energy Company Obligation funding, owners contributions and funding from registered social landlords who may choose to insulate their homes at the same time.</p> <p>The area-based programmes aim to:</p> <ul style="list-style-type: none"> <li>• Target fuel-poor areas</li> <li>• Offer insulation measures (External Wall Insulation, Cavity Wall and Loft Insulation)</li> <li>• Offer first time central heating</li> </ul> <p>External Wall, Cavity Wall and Loft Insulation are eligible for:</p> <ul style="list-style-type: none"> <li>• Scottish Government EES:ABS grant</li> <li>• Energy Company Obligation (ECO) funding</li> </ul> <p>An owner's contribution may be required to cover the remainder of the cost for installation.</p> <p>First Time Central Heating measure is eligible for:</p> <ul style="list-style-type: none"> <li>• Scottish Government EES:ABS grant</li> <li>• Energy Company Obligation (ECO) funding</li> <li>• Warm Homes Fund</li> </ul>
<b>Source of opportunity</b>	Scottish Government



<b>Financing opportunity</b>	<b>Warmer Homes Scotland</b>
<b>Description</b>	<p>This fund is worth at least £16 million per year for up to seven years. It is available to private sector households (tenants or owner-occupiers) who are living in or at risk of living in fuel poverty and who meet the qualifying eligibility criteria.</p> <p>Warmer Homes Scotland has a strong focus on heating and insulation measures to improve the energy efficiency of properties making them warmer and more affordable to heat. The scheme also includes microgeneration measures to offer a wider range of heating options to off-gas households. Additional renewable and enabling measures have recently been made available including ground source heat pumps, micro-wind, micro-hydro and micro-CHP systems that will be of particular benefit to those households in remote and rural areas who are not on the gas grid.</p> <p>The scheme is available across Scotland and is delivered on a regional basis (including a separate Islands region) by Warmworks Scotland. This ensures that all households, including those living in more remote parts of the country, get the same level of service regardless of their location.</p>
<b>Source of opportunity</b>	Scottish Government
<b>Financing opportunity</b>	<b>Island Green Recovery Fund.</b>
<b>Description</b>	<p>The Islands Green Recovery Programme is now open for applications and will deliver investment in low carbon transport, food sustainability and zero waste projects. The Scottish Government has announced a £2 million programme aimed at supporting locally led green projects in island communities to recover from the coronavirus pandemic.</p> <p>Part of the funding will be used to help independent food retailers and businesses to introduce packaging-free shops and remove the need for disposable packaging. It will also focus on sustainable initiatives, climate change projects and those that aim to improve local supply chains.</p> <p>The £2 million is shared between:</p> <ul style="list-style-type: none"> <li>• Zero Waste Scotland fund – £300,000 to introduce packaging-free shops</li> <li>• Energy Saving Trust fund – £300,000 to support carbon-neutral initiatives</li> <li>• Inspiring Scotland fund – £900,000 to support community recovery projects</li> <li>• Highlands and Islands Enterprise fund – £500,000 to support green economic recovery</li> </ul>
<b>Source of opportunity</b>	Scottish Government

Financing opportunity	MCS charitable foundation
<b>Description</b>	<p>MCS Charitable Foundation is open to funding a range of projects that advance the Foundation's mission to accelerate the adoption of renewable energy and low carbon technologies. Funding Criteria include:</p> <ul style="list-style-type: none"> <li>• For specific time-bound projects that meet the Foundation's mission. Projects should have a UK-wide impact, either through having a national reach or through developing/demonstrating an innovative approach that could be replicated, adapted or scaled up.</li> <li>• Bids should fall into one of the following themes:               <ul style="list-style-type: none"> <li>• Education, skills and CPD.</li> <li>• Public awareness/information and consumer confidence.</li> <li>• Zero carbon planning.</li> <li>• Local zero carbon delivery initiatives.</li> </ul> </li> <li>• Bids should also meet at least one of the following criteria:               <ul style="list-style-type: none"> <li>• Seed funding for innovative initiatives.</li> <li>• Support delivery of a proof of concept.</li> <li>• Research to support innovation or capacity building in one of the themed areas.</li> <li>• Sharing good practice.</li> </ul> </li> </ul> <p>MCS Foundation is also open to applications that fall outside of these standard criteria if the applicant organisation can make a strong case that the proposal could have a step-change impact in society's action towards the Foundation's mission.</p> <p>Applications that have matched funding will be looked upon favourably, and grants will usually be for £5,000 to £50,000. In exceptional cases grants will be considered for higher amounts up to £100,000. Applications may be submitted from public organisations and not-for-profit companies as well as charities.</p>
<b>Source of opportunity</b>	<a href="#">MCS Charitable Foundation</a>

<b>Financing opportunity</b>	<b>Crowd funding/community shares.</b>
<b>Description</b>	<p>Community shares is a funding mechanism which helps create sustainable enterprises serving a community purpose and has been used to good effect on other community schemes across Scotland. Community shareholders buy shares in local enterprises providing goods and services that meet local needs. This type of investment has been used to finance shops and pubs, community buildings, media and sports initiatives, community renewable energy etc.</p> <p>A key principle of community shares is that there is a recognition that they provide a limited return on investment, and investment is seen as primarily for social return. The key benefit of generating funds through a share offer is that the shares have no set repayment date. Repayment shareholders is linked to the performance of the enterprise and interest is at discretion of directors.</p>
<b>Source of Opportunity</b>	Community
<b>Financing opportunity</b>	<b>Social Investment Scotland (SIS).</b>
<b>Description</b>	<p>SIS are a social enterprise and charity that offer loan funding and business support for other social enterprises, charities and community groups looking to make a positive impact on people's lives, society or the environment.</p> <p>Their vision is for an Impact Economy; where social entrepreneurs, businesses, consumers, investors and government are aligned and focused on delivering impactful actions and meaningful outcomes.</p> <p>Interests rates are calculated on a case-by-case basis and an Investment Manager works with the organisation to work out what is the most affordable option. As SIS is a social enterprise and charity itself, all profits are reinvested into their mission and drive to support more impactful enterprises.</p> <p>SIS have historically been very supportive to Community Trusts in providing loan financing for developments, including renewable energy developments. They are particularly useful as they, unlike High Street banks, do not require security for their loans.</p>
<b>Source of Opportunity</b>	<a href="#">Social Investment Scotland</a>

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**Financing opportunity**
**Energy Redress Fund.**


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**Description**

The Energy Redress Scheme is administered by Energy Saving Trust and aims to distribute available funds to support energy consumers in vulnerable situations, as well as the development of products or services which would provide a benefit for certain groups of energy consumers.

Officially named 'The Energy Industry Voluntary Redress Fund' – the fund collects voluntary payments from energy companies (who may have breached rules) to redress harm caused to energy consumers and is regulated by Ofgem - the independent energy regulator for Great Britain.

Under Ofgem's redress process, energy companies who are found to have breached a license condition or were part of an investigation or compliance case, can make voluntary payments alongside or instead of fines and compensation to address any harm caused to consumers.

Previous projects have included delivering energy advice to vulnerable households, working with the health sector to support people at risk from cold damp homes, installing innovative heat networks and developing new software to enable low income households to purchase discounted energy generated locally.

Registered charities can apply for the Fund to deliver energy related projects that meet the scheme priorities and benefit people in England, Scotland and Wales.

Priorities include:

- Support energy consumers in vulnerable situations and;
- Deliver benefits to the types of consumers that were negatively impacted by the specific issues that triggered the redress payment.

In addition to this core priority, up to 15% of Energy Redress funds can support the development of innovative products and services related to energy. Innovation projects must:

- Have a realistic prospect of delivering benefits to existing and/or future energy consumers.
- Help to reduce the environmental impact of energy use and be efficiently managed and provide good value for money.

Any additional priorities linked to a funding round will be made clear to applicants when the round opens.

The amount of funding available through the scheme varies depending on what payments have been made by energy companies and is reviewed on a quarterly basis. Eligible charities that have registered interest in the scheme will be notified when funds become available. The minimum grant that can be requested is £20,000 and the maximum grant amount varies depending on the size of the fund available.

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The scheme can only fund projects lasting up to two years, can fund up to 100 per cent of the project cost and can cover revenue and capital measures.

Applications are made through an online system and closing dates for applications are determined each quarter. Successful projects will be selected by an independent panel of experts.

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**Source of Opportunity** [Energy Saving Trust](#)

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**Financing opportunity** **SSE Resilient Communities Fund.**

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**Description**

This Fund is available for non-profit making organisations, community groups and charities working to protect and enhance the resilience of those most vulnerable in the north of Scotland. It supports local projects that:

- Protect the welfare of vulnerable community members through enhancing their resilience and improving community participation and effectiveness
- Enhance community facilities, services and communication – particularly to support local response to a significant emergency event.

Applications of up to £20,000 are usually considered by an independent fund panel, although the Fund is now closed until 2021.

The programme as initially run as a pilot but SSEN has pledged to extend the fund to 2023 using a proportion of the income it receives from the industry regulator, Ofgem, in relation to its stakeholder engagement performance, allowing over £2m to be distributed to community-led groups and charities working in its network areas in the north of Scotland and central southern England.

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**Source of Opportunity** [Scottish And Southern Energy Networks](#)

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## 6. Monitoring

Monitoring is a vital part of the transition as it enables the Community to assess progress and generate feedback on the transition. Using a self-assessment matrix is an excellent method for monitoring status and progress. Ideally, these assessments should be completed at least twice a year. Below is a summary of the results of the self-assessment from September 2020, summarized in Figure 9.

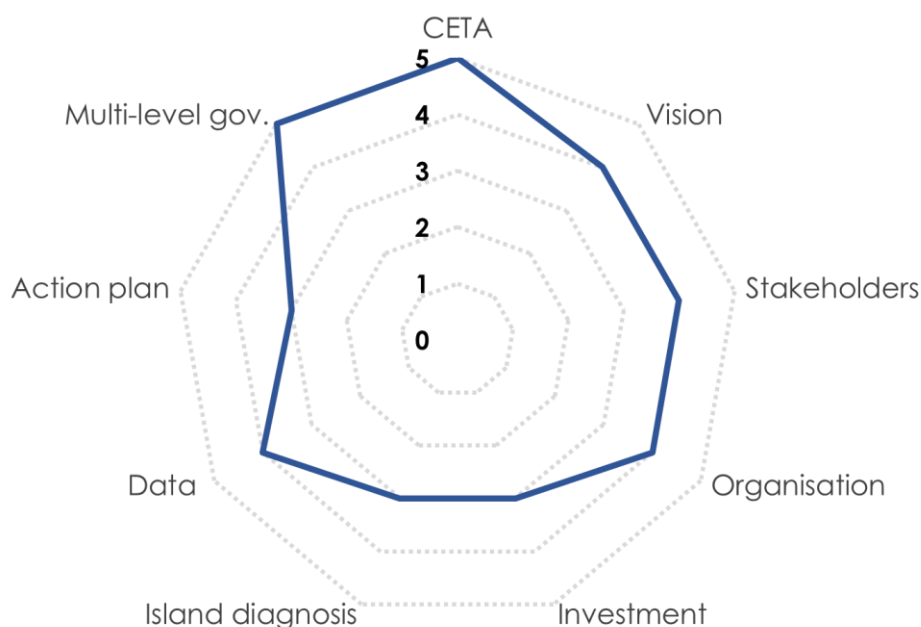


Figure 9 – The Transition Indicators were evaluated for the off-grid Scottish communities in September 2020.

### Indicator 1: Clean Energy Transition Agenda

Score: 5

The established Transition Team (see Section 2 in Part II) is working together with a range of stakeholders from multiple stakeholder groups to develop a shared vision and transition pathways to achieve this vision. The Agenda has been approved by the Transition Team and is being supported by several stakeholders at Government and Local Authority level. It was accepted by the Clean Energy for EU Islands Secretariat in September 2020.

### Indicator 2: Vision

Score: 4

There is a medium-term island-wide vision on clean energy that includes clear objectives. These are listed in Section 3 in Part II and focus first and foremost on energy resilience, as well as increasing the percentage of renewable energy used for all demand, with the gradual reduction of the use of fossil fuel-based sources. This vision has not yet been approved by the relevant authority on each island, nor does it have explicit targets (yet).

### Indicator 3: Community – Stakeholders

Score: 4

There is a commitment from multiple stakeholder groups associated with each island (averaged at 2-3) to advance the transition to clean energy on the island. This commitment is formalised at an island level with each island having taken the CE4EUI pledge. The Off-grid Communities are waiting on confirmation from all stakeholder groups (as listed in Section 3 of Part I).

#### **Indicator 4: Community – Organisation**

Score: 4

There is an island-wide Transition Team in place for each island, as well as the over-arching facilitator that is Highlands and Islands Enterprise. The Team consists of, and is supported by, actors from multiple stakeholder groups that drives the energy transition process. For example, each island community is liaising with the relevant constituted community organisation, HIE, Scottish Government and Local Authority.

#### **Indicator 5: Financing concept**

Score: 3

Regular liaising with Scottish Government means the Transition Team is aware of major capital and development funding opportunities for clean energy projects. These have been listed and shared with the Off-grid Communities. A project pipeline has also been identified for each Community, with estimated values. However, specific financing solutions for each step (and the analysis of these) has not yet taken place, nor is there an investment concept that includes a financing plan with committed and potential sources of funding.

A detailed financial model has very recently been developed (with support from HIE) to enable each Community to assess investment requirements. This is being utilised by all Off-grid Communities and will enable them to produce an investment concept and financing plan.

#### **Indicator 6: Decarbonisation plan – Island diagnosis**

Score: 3

The Transition Team have completed a technical and economic analysis of the energy systems on a sub-/supra-island level. The availability of information associated with this will be greatly improved over the coming months as a project on developing a Micro-grid Asset Register with Strathclyde University progresses. Once this project is complete, the Team should have an analysis of all the systems that includes a final energy consumption breakdown/energy balance for some of the sectors identified in Section 4 of Part II.

#### **Indicator 7: Decarbonisation plan – Data**

Score: 4

Following the support received by the Clean Energy for EU Islands Secretariat, 3E were able to complete a recent inventory of consumption and CO<sub>2</sub> emission data for the majority of



the sectors identified as important in the decarbonisation process. This analysis was based on local reporting from the relevant constituted organisation in each Off-grid Community. Although this is very positive, there is currently no periodic reporting process in place for all Off-grid Communities. A system needs to be established whereby this data is collected regularly across all Communities, as well as a system for collecting said data.

#### **Indicator 8: Decarbonisation plan – Action Plan**

Score: 3

The Transition Team have selected the priorities and key actions and measures on clean energy for each Off-grid Community. These build, in part, on existing infrastructure and resources but attempts to identify key additional priorities for other generation sources, as well as demand management. There is not yet an island-wide action plan on clean energy that describes the necessary actions to achieve the vision, however, this document takes a major step to creating such a plan. Once a plan has been developed it will be approved by the relevant authority to provide an actions table with timeline and budget to achieve the targets and objectives.

#### **Indicator 9: Multi-level governance**

Score: 5

There is interaction from the Transition Team with all relevant local, regional and national authorities on the clean energy transition. Through this interaction the Team have ensured the Clean Energy Transition Agenda is aligned with the existing energy strategies at local, regional and national levels.

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