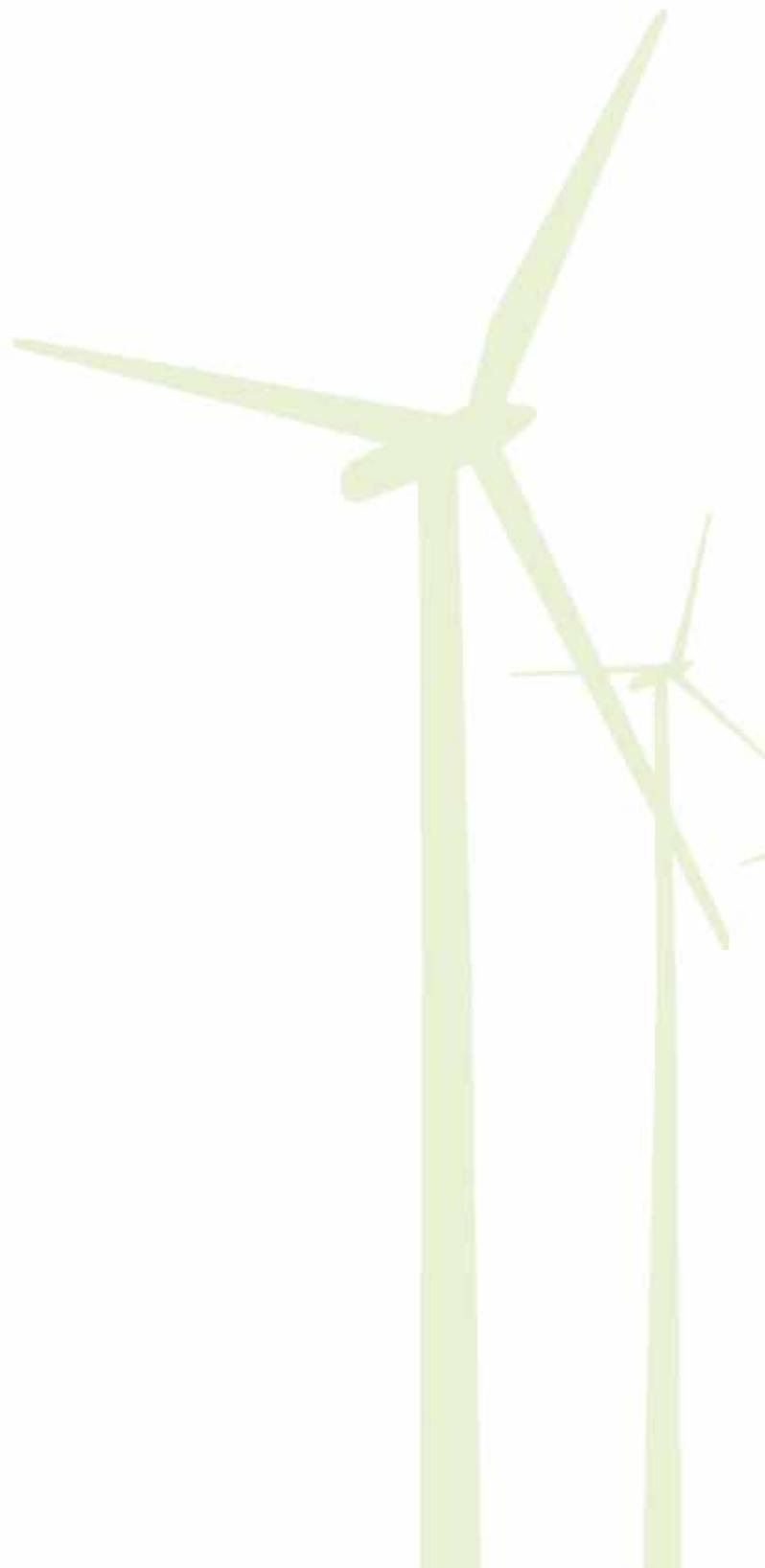




FROM REMOTE ISLAND GRIDS TO URBAN SOLAR CO-OPERATIVES

COMMUNITY POWER SCOTLAND





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INTRODUCTION

COMMUNITY POWER SCOTLAND

WHAT IS COMMUNITY ENERGY

The term community energy is used in a variety of different contexts including electricity and heat generation, grid management and collective power purchasing. Community energy may describe a geographic community or a community of interest.

As such it is useful to define community energy through common characteristics. These include:

- Ordinary people or citizens are involved in running the project through community groups such as co-operatives or development trusts
- There is a co-operative, democratic or specifically non-corporate structure
- There are tangible local benefits to people living or working close to projects
- The profits go back to the community or are re-invested in other community energy schemes.

As community energy grows and develops as a concept, its benefits are better understood. In addition to helping achieve emissions reductions, it enables communities to harness local natural resources to build social capital, create local and regional employment opportunities, create revenue to address community development needs and combat fuel poverty.

Community ownership and participation in projects can also help generate support and acceptance of renewables more broadly. Furthermore, involvement in community projects helps stimulate citizen interest in other areas of energy such as energy conservation and demand side management.

WHY COMMUNITY ENERGY

In the context of climate science and our historical responsibility for greenhouse gas emissions, perhaps the most important legacy that Scotland can leave for future generations is the transformation of our energy system from one dependent on dirty, finite fossil fuels to one run on clean, green renewables. Blessed with abundant renewable resources including wind, hydro, tidal, wave and solar, Scotland is already making good progress on this front.

However while the transition to a renewable energy system is broadly understood to be necessary, it is crucial that in our urgency to address the climate problem we do not miss this opportunity to address the underlying inequalities of our current highly centralised energy system.

Both the environment and people must be at the heart of the renewables transformation and the best way to achieve this is through Community Power - people's ownership of renewable energy. In order to really deliver in terms of climate change and a fairer energy system, community energy needs to become much bigger and broader than the current, albeit expanding, niche it occupies.

COMMUNITY ENERGY IN SCOTLAND

The aim of this report is to show the great diversity of community energy projects that exist in Scotland by sharing some great examples. Community power has been instrumental in helping Scotland establish itself as a leader in renewable energy and keeping the Scottish Government on track to meet its ambitious target of the equivalent of 100% demand for electricity to be met from renewable sources by 2020.



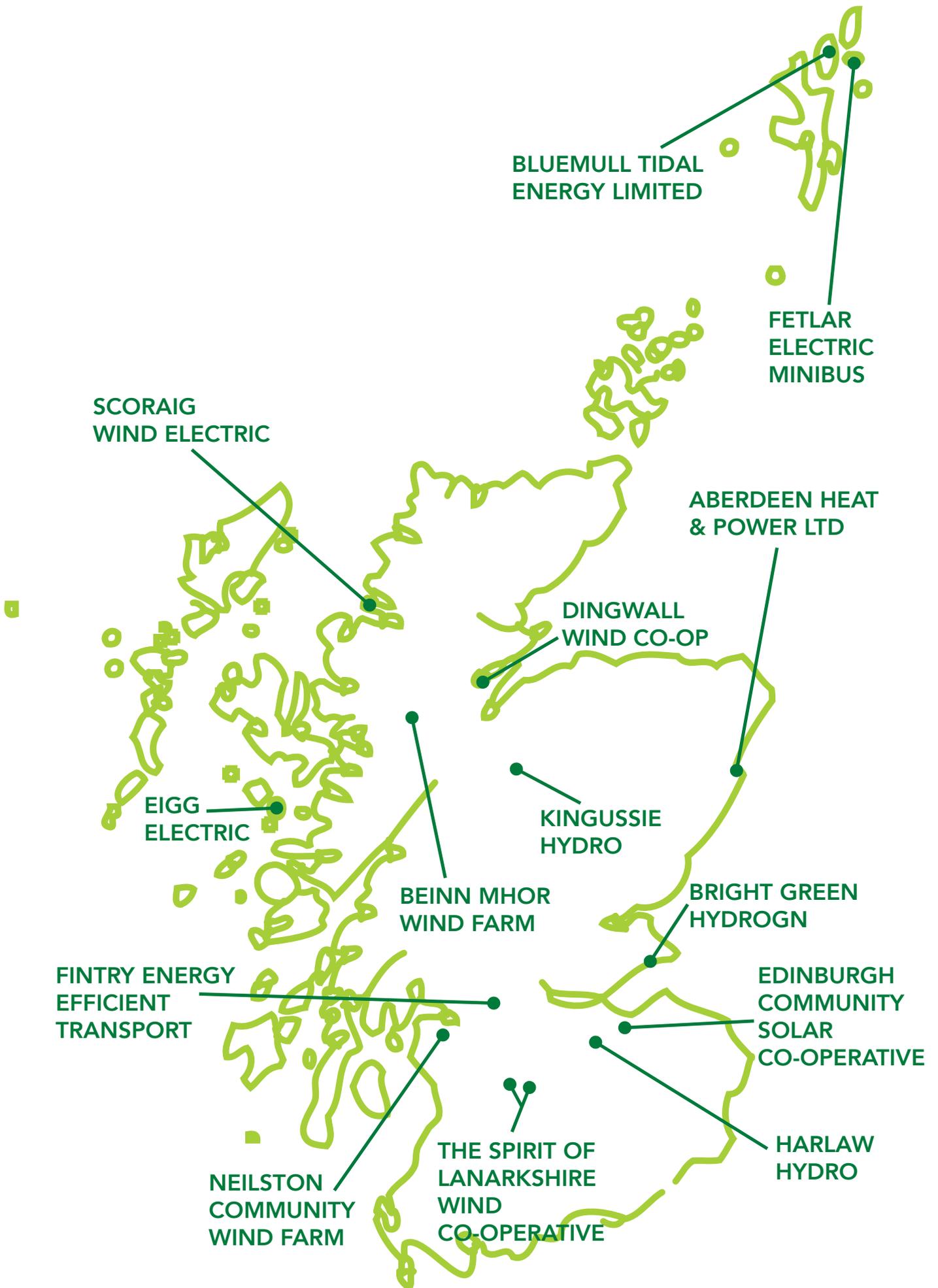
Support for community energy will be critical to meeting nationally-binding greenhouse gas reduction targets for 2020 and 2050, and decarbonisation of the power sector by 2030.

The Scottish Government continues to demonstrate support for community energy, for example, through its unique locally and community owned energy target of 500MW by 2020 and funding opportunities. These include the Community and Renewable Energy Scheme (CARES), the Renewable Energy Infrastructure Fund (REIF) and the £20 million Local Energy Challenge Fund which was announced in August 2014.

In the following pages we share examples of communities who have come together to create local energy projects whether

motivated by combating fuel poverty, creating income for community development or concerns about climate change. The studies highlight the key challenges as well as the sometimes unexpected benefits of these schemes, and explore different legal structures and financing mechanisms. Finally, the report concludes with discussion and recommendations for policy and legislative changes that will be essential to enable communities the length and breadth of Scotland to play a leading role in the transition to a clean, green, fair energy system.





ENERGY DEMOCRACY SPIRIT OF LANARKSHIRE WIND CO-OPERATIVE

Location South Lanarkshire

Size of community 607 co-operative members

Type of energy project Wind energy

Stage of development Implemented



BACKGROUND

Under an innovative agreement between commercial developer Falck Renewables Wind Limited and not-for-profit company Energy4All, Scottish wind farms developed by the former allow local energy co-operatives set up by Energy4all to buy an economic stake in the developments. Spirit of Lanarkshire is the fifth project under this agreement but the first to have stakes in two separate wind farms near Strathaven: Six 2.5MW turbines are located at Nutberry Hill and twelve 2.5MW turbines at West Browncastle.

LEGAL STRUCTURE & SET-UP

Energy4All has established Spirit of Lanarkshire as a Co-operative Society, and bought a combined stake of £2.7 million (€3.4 million) in the developments. This means Spirit of Lanarkshire does not own a percentage of the physical asset but rather that it is entitled to a percentage of financial earnings, appropriate to its investment.

The operation and management of the sites is handled by Falck subsidiaries NWEL at Nutberry Wind Farm and WBWEL at West Browncastle Wind Farm. Energy4All monitors Falck's performance which has a good track-record of providing returns for members of other co-operatives under its agreement with Energy4All. The co-operative itself is governed by a Board of Directors under rules approved by the Financial Conduct Authority (FCA).

Through investment in shares individuals or other co-operatives become members

of Spirit of Lanarkshire and thereby own it. Legally, members are protected by limited liability and allowed to make decisions through a 'one member one vote' system in Annual General Meetings. Energy4All will carry out administrative services on behalf of Spirit of Lanarkshire for which it will be compensated by Falck.

Nutberry Wind Farm became operational in August 2013 and West Browncastle started generating electricity in April 2014. The Spirit of Lanarkshire co-operative started trading with the purchase of a stake in the Nutberry Wind Farm in September 2013.

FINANCING

Spirit of Lanarkshire was required to raise a minimum of £250,000 (€316,000) for each wind farm to be entitled to purchase a stake in the developments and the 'right to revenue'. The maximum investment was £1 million (€1.3 million) for Nutberry and £1.7 million (€2.1 million) for West Browncastle.

To achieve its target the co-operative launched a share offer that allowed members of the public to buy between 250 and 20,000 shares with a £1 value each. Local investors take priority over regional investors and members of other Energy4All co-operatives.

Falck has guaranteed that the return on investment excluding expenses incurred by the co-operative does not to drop below 6.5% per annum. It is however estimated that the annual return is likely to average at 9.92%

// In the UK, we have a long way to go to match what has already happened in Germany and in some parts of the United States but the Spirit of Lanarkshire is a very welcome step in the right direction.

Tom Greatrex -
Shadow UK Energy Minister





over the project's 25 year lifespan. After 25 years the full investment will be returned to shareholders.

South Lanarkshire Council strongly encourages wind farm developers to commit to payment into its Renewable Energy Fund. South Lanarkshire Council then takes control of community benefit payments from local wind developments. Spirit of Lanarkshire will pay £2,500 (€3.200) per annum into this fund.

KEY CHALLENGES

- Prevalent perception in Scotland that energy co-operatives, particularly ones that do not own the physical assets and draw on a wide community of interest, are seen as capitalist as opposed to projects with 100% local ownership

KEY BENEFITS

- Falck carries the costs and risks to develop the sites including launch of share offer document
- Annual interest payments to members of the co-operative and active participation in the renewable energy transition
- Ultimate return of investment
- £2,500 per annum into South Lanarkshire Council's Renewable Energy Fund



ISLAND POWER EIGG ELECTRIC

Location Isle of Eigg
Community Local population: 96
Type of energy project renewable energy generation (wind, hydro, solar); independent grid management
Stage of development Implemented

BACKGROUND

Until 2008 Isle of Eigg residents were largely dependent on costly fossil fuels shipped in from the mainland.

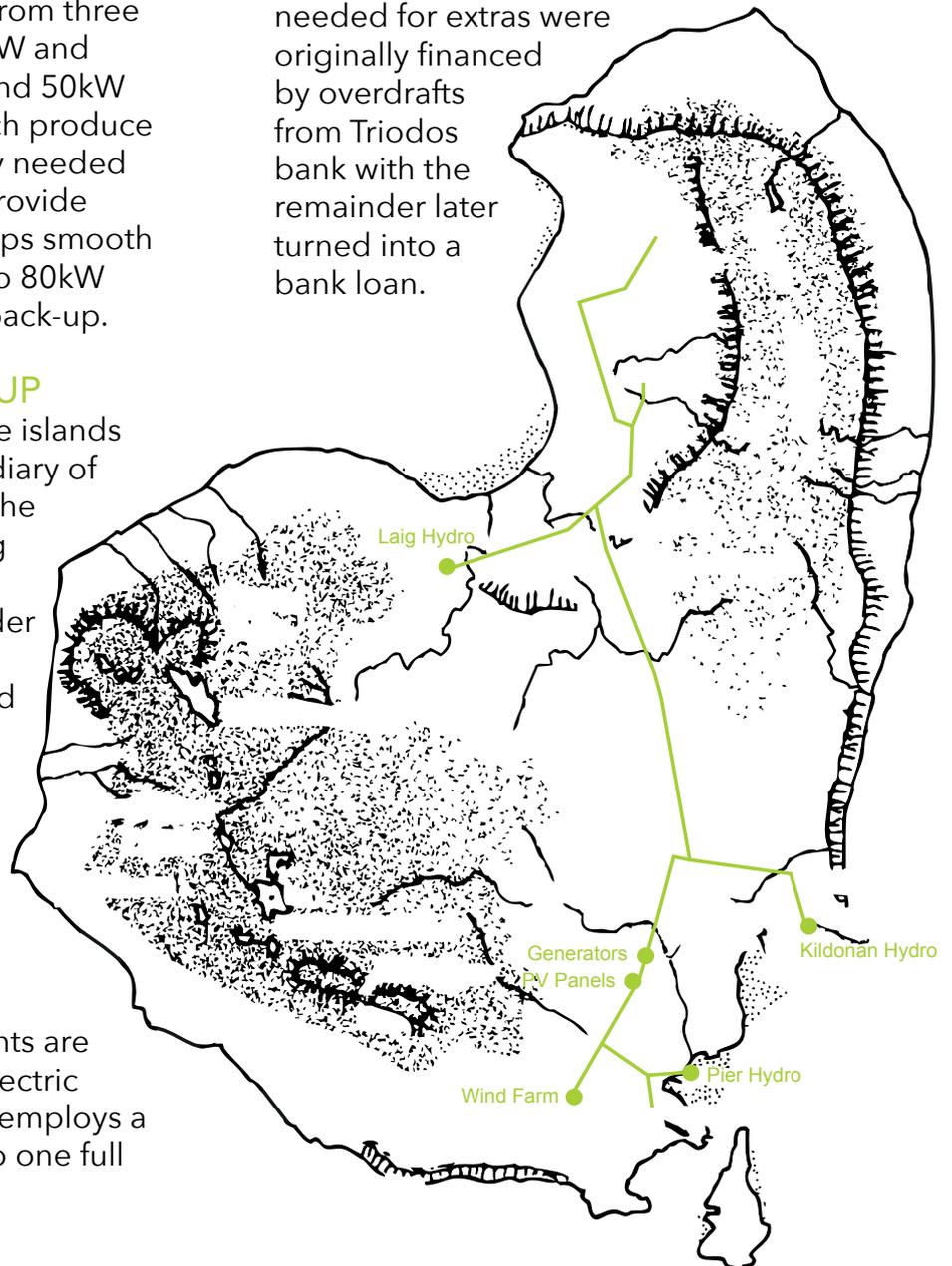
Now the Isle of Eigg is home to the world's first stand alone energy grid that provides electricity from a combination of three renewable energy sources: 11km of underground high voltage cable connects residents to energy generated from three hydroelectric plants (100kW, 5kW and 6kW), four 6kW wind turbines and 50kW solar photovoltaic capacity which produce approximately 90% of electricity needed locally. A battery bank able to provide electricity for up to 24 hours helps smooth out supply and demand and two 80kW diesel generators are used for back-up.

LEGAL STRUCTURE & SET-UP

Eigg Electric, which operates the islands energy infrastructure, is a subsidiary of the Isle of Eigg Heritage Trust. The Trust was set-up in 1997 by Eigg residents, the Highland Council and Scottish Wildlife Trust in order to buy the island. The trust is governed by a voluntary, elected board of directors comprising 4 Eigg residents, one member each from the Highland Council and Scottish Wildlife Trust and an independent chair. All subsidiaries of the Eigg Heritage Trust, including Eigg Electric, employ the same company secretary. Four residents are appointed to a separate Eigg Electric board. In addition Eigg Electric employs a maintenance team equivalent to one full time paid member of staff.

FINANCING

The Eigg Heritage trust employed a renewables development officer, Ian Leaver, for six months who managed to secure financing needed to set up Eigg Electric. The £1.6 million (€2 million) required for this came largely from EU funds. In addition, residents paid £500 or £1000 (€625 or €1250) for a 5kW domestic or 10kW business connection. £125,000 (€156,000) needed for extras were originally financed by overdrafts from Triodos bank with the remainder later turned into a bank loan.



To keep capital investment down, the Isle of Eigg community decided to restrict access to electricity to 5kW per household and 10kW per business. Every household and business has to manage its consumption with the help of an energy monitor. In the rare event that a household for example, consumes over 5kW at any one time, it is automatically cut off from supply and can only be reconnected by the Eigg Electric maintenance team.

The running cost of Eigg Electric is covered through income from an off-grid Feed-in Tariff (FIT)*, Renewable Obligation Certificates (ROCs) and a local energy tariff for residents and businesses. Ian Leaver explains the project was timed well as shortly after regulation in the UK changed which excluded renewable energy installations from FIT and ROC benefits if they received public grant funding.

KEY CHALLENGES

- Complexity of project
- Planning

KEY BENEFITS

- 24/7 electricity
- Drastic reduction in energy costs
- Has sparked interest in other energy efficiency initiatives on the island



* Like the Feed-in Tariff, the off-grid FIT pays households or businesses a fixed payment per unit of energy generated to promote the use of renewable technology



FARMING WIND DINGWALL WIND CO-OP

Location Dingwall

Community 179 members

Type of energy project Wind energy

Stage of development Implemented



Photo: Dingwall Wind Co-op

BACKGROUND

Dingwall Wind Co-op operates a 250kW turbine on the property of Knockbain Farm near Dingwall. The owner David Lockett was introduced to Sharenergy, a co-operative that helps set up other energy co-operatives: "We were initially intending to take out a loan to build the turbine. When we heard about the co-operative route it seemed like an obvious way to go as benefits are shared with the local community."

// We were initially intending to take out a loan to build the turbine. When we heard about the co-operative route it seemed like an obvious way to go as benefits are shared with the local community.

David Lockett -

Dingwall Wind Co-op



LEGAL STRUCTURE & SET-UP

As a co-operative Dingwall Wind Co-op is owned by its members. Every member has one vote at the Annual General Meeting regardless of the amount of shares owned. The day-to-day running of the co-operative is managed by a board that currently comprises five members including David Lockett's son Richard. David was a founder director but stood down from the board that runs the co-operative.

Sharenergy is paid to provide continued administrative services for the co-operative.



FINANCING

A total of £856,000 (€1,083,500) required for the project was raised through a share offer, which makes the project the first wind development in Scotland that is 100% owned by a co-operative. Members of the public invested between a minimum of 250 and maximum of 20,000 shares at £1 each. Nearly 50% of shares required were sold within four days of the share offer launch, with 75% of all shares being sold within a 15 mile radius of Dingwall.

The co-operative is expected to generate an average 7.5% return on investment for members over the twenty-year lifespan of the turbine. The development has also received advance assurance from HMRC that the first 150,000 shares can benefit from Seed Enterprise Investment Scheme (SEIS) and Enterprise Investment Scheme (EIS) tax relief: 50% of the value of shares for SEIS and 30% for EIS can be claimed back against income tax.

In addition, a minimum of £2,000 (€2,500) per year (expected around £8000 (€10,000)) of revenue generated will be paid into a community fund. The money will be distributed through a community trust offering grant schemes to local organisations.

Prior to the share offer launch, the Locketts obtained planning permission and a binding offer for connection to the national grid. This

was financed by the Lockett family who set up a company called Knockbain Renewables for the early stages of the development. The co-operative reimbursed these early costs when it formally took over the project.

KEY CHALLENGES

- High up-front costs
- Risk of share offer being unsuccessful
- Acceptance of a new model

KEY BENEFITS

- Local reduction of reliance on fossil fuels
- Renewable electricity generation of equivalent to 120 homes
- Annual displacement of 240 tonnes of CO₂e
- Income through the sale of electricity and Feed-in Tariff scheme
- Income to local community fund
- Potential to extend co-operatives to other installations in the future



REVIVING HISTORY KINGUSSIE HYDRO

Location Kingussie

Community 150 K.C.D.C. members that represent wider population of 1500

Type of energy project Micro hydro

Stage of development Under construction

BACKGROUND

A century ago a mini-hydro scheme existed on the River Gynack that runs through Kingussie in the Scottish Highlands. The installation once provided electricity to the Grampian Sanatorium, a well-known treatment centre for tuberculosis, but fell into disrepair with the introduction of national grid infrastructure to the town.

In 2005 members of the Kingussie and Vicinity Community Council (KVCC) who later set up the Kingussie Community Development Company (K.C.D.C.) began to plan the revival of the hydro scheme. Nine years later a new 20kW turbine was installed on site.

Donald Grant, one of K.C.D.C.'s directors, says: "Having local residents with valuable skills, such as a semi-retired chartered engineer and

// **Having local residents with valuable skills, such as a semi-retired chartered engineer and treasurer, has been a real boon. We hope that our experiences will help other community groups take forward their energy projects.**

Donald Grant - K.C.D.C. //

treasurer, has been a real boon. We hope that our experiences will help other community groups take forward their energy projects."





LEGAL STRUCTURE & SET-UP

The hydro scheme is now managed by K.C.D.C. a limited company with charitable status. A sub-committee of the board that includes a member of the Kingussie and Vicinity Community Council oversees the day-to-day business of the scheme.

The hydro installation will provide electricity directly to a nearby golf club, which in turn feeds into the national grid. Profits from sales of electricity to the national grid and Feed-in Tariff (FIT) payments go to K.C.D.C. . In addition, the golf club pays K.C.D.C. a set fee per KWh that is approximately one third cheaper than a standard tariff. It is estimated that the project will generate £10,000 (€12,500) to run K.C.D.C. and fund other community initiatives.

FINANCING

The overall cost of the scheme is estimated at £200,000 (€253,000). This was largely covered through a number of non-public grants including funding from Scottish and Southern Energy (SSE), the players of People's Postcode Lottery Dream Fund and the Greenshoots Fund which has been set up by FMC Technologies Dunfermline and is open to Scottish applicants only. However, early on K.C.D.C. secured £93,000 (€116,000) worth of LEADER II funding from the European Union, which covered almost half the cost of the project. Shortly after the UK government brought forward a policy change that meant community energy schemes were no longer eligible for public grant funding and simultaneously benefit from Feed-in Tariff

payments. K.C.D.C. chose FITs and returned the LEADER II grant.

K.C.D.C also tried to be cost effective by teaming up with a larger hydro scheme for the construction but the timeframes for both projects were incompatible.

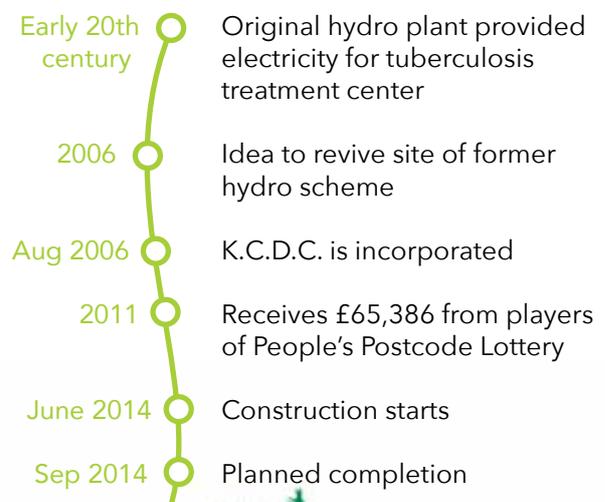
Finally K.C.D.C. gave up on its vision of using an Archimedes screw which makes the mechanism visible and more accessible for educational purposes due to funding constraints.

KEY CHALLENGES

- Financial decisions
- Change in UK policy that impact on funding

KEY BENEFITS

- Income generation for K.C.D.C. and community development initiatives
- Potential for educational benefits
- Kingussie Golf Club benefits from renewable electricity



POWERED BY SUNSHINE EDINBURGH COMMUNITY SOLAR CO-OPERATIVE

Location Edinburgh

Community Local membership to be determined

Type of energy project Solar PV

Stage of development In planning

BACKGROUND

Since local elections in 2012 Edinburgh City Council is governed by a Labour and Scottish National Party coalition. The 'Capital Coalition' has a shared commitment to deliver on a number of pledges published under the coalition contract. This includes a pledge "to encourage the development of Community Energy Co-operatives".

First to take advantage of this commitment is the Edinburgh Community Solar Co-operative (ECSC) that proposes to procure, install, own and manage solar PV systems on 25 roofs of buildings owned by Edinburgh City Council. The public buildings including schools, community buildings and leisure centres will carry a combined generating capacity of approximately 1MW - the largest scheme of this kind in the UK. The objectives of ECSC are to make ownership of renewable energy accessible to more people within the city of Edinburgh; help deliver low carbon initiatives for the buildings which host its panels; and

help other community groups in the city that wishes to tackle fuel poverty or reduce carbon emissions.

LEGAL STRUCTURE & SET-UP

ECSC is a registered Community Benefit Society (Bencom) under the Industrial and Provident Act 1965. This means it will follow principles outlined by the International Co-operative Alliance which includes giving each member one vote at their AGM, regardless of the amount of shares an individual holds. The 'one member one vote' principle is what makes co-operatives highly democratic in terms of governance structure. A board of trustees is responsible for the day-to-day running of the organisation.

Following a tendering process, ECSC has awarded a contract to help the founding members develop the scheme to Energy4All, a non-profit social enterprise that has helped form twelve other renewable energy co-ops in the UK.



Photo: Friends of the Earth Scotland



FINANCING

ECSC will raise the required capital through a community share offer: ordinary people from across Edinburgh will become members of the co-operative by purchasing shares worth a minimum of £250 (€320) and a maximum of £100,000 (€125,000).

The co-operative will generate income through the sale of electricity into the national grid and Feed-in Tariff (FIT) payments. In addition, the Council will pay ECSC for solar electricity consumed on site, albeit at a lower cost, resulting in a reduction in energy bills for the Council. The Council will further benefit from a reduction in tax payments under the Carbon Reduction Commitment Energy Efficiency Obligation and help the Council meet its required contributions to the national emissions reductions target under the Climate Change (Scotland) Act 2009. Members of the co-operative will receive a capped 5% return on investment.

Surplus income generated will feed into a community fund which is intended to deliver on the objectives of ECSC.

There are substantial development and legal costs at the early stages of the project that arise for example, from surveys, lease agreements, procurement of panels, launching the share offer and project management. ECSC has received a grant from the Scottish Government's Community and Renewable

Energy Scheme (CARES) to undertake building surveys and intends to apply for a loan to complete the development work necessary to produce a public share offer and raise the money required to install the panels.

KEY CHALLENGES

- FIT degeneration as project is being developed
- Securing funding for the early stages of the project

KEY BENEFITS

- Unique opportunity for urban residents to become part of community energy scheme
- Cost savings for Edinburgh City Council
- Council and citizens taking joint action to combat climate change
- A community benefit fund to help tackle fuel poverty and reduce carbon emissions



HARNESSING RIVER ENERGY HARLAW HYDRO

Location Balerno, Edinburgh
Community 232 members and growing
plus wider community of Balerno
Type of energy project Hydro
Stage of development Under construction

BACKGROUND

Once upon a time, the Water of Leith River that runs through Balerno, a suburb on the outskirts of Edinburgh, powered approximately 70 mills located on its banks. Concerns over climate change and the need for green energy are now driving the local revival of hydro technology.

Harlaw Hydro aims to produce electricity through a 95kW hydro scheme that will generate enough electricity for approximately 56 homes and save 129 tones of carbon.

LEGAL STRUCTURE

In September 2012 the Balerno Village Trust (BVT) set up Harlaw Hydro Ltd, an Industrial and Provident Society (IPS), to install and manage the proposed hydroelectric scheme at the local Harlaw Reservoir.

Harlaw Hydro Ltd is a co-operative structure owned by its members who have one vote at the Annual General Meeting regardless of the amount of shares they own. The current board of directors was elected at the society's first AGM in May 2014 when they took over from the interim board that had governed until then.

FINANCING

Feasibility studies were funded through grants from the Scottish Government's Community and Renewable Energy Scheme (CARES).^{*} Expense was kept to a minimum with team members giving their skills and time for free. The funding needed to get the project to the share offer, including £1500 (€1,900) for the share offer document, it largely came from earnings of BVT's monthly farmers market.

^{*} At the time CARES was administrated by Community Energy Scotland



Photo: Mike Molleson



The legal set-up of Harlaw Hydro Ltd made it possible to raise the capital investment needed for the scheme through a share offer, something the legal structure of BVT a company limited by guarantee with charitable status does not allow. The share offer was so successful, raising all the £313,000 (€393,000) required, that there was no need to look for other funding sources as originally anticipated. In fact it raised a total of £335,250 (€421,500) through minimum investments of £250 (€314). However, delays and changes to the project including an increase in turbine size from the originally planned 65kW to 95kW have since led to a rise in cost of an additional £50,000 (€63,000), which is likely to be raised through a re-launch of the original share offer.

The scheme will generate income by selling electricity to the national grid at a commercial rate of 3.2 pence (4 cent) and Feed-in-Tariff payments, which are guaranteed for 20 years at 20.21 pence (25 cent). Members of Harlaw Hydro Ltd will receive approximately 4% interest payments on their investments. The surplus generated will be used for the benefit of the community through the Balerno Village Trust. Members also have the opportunity to benefit from Seed Enterprise Investment Scheme (SEIS) or Enterprise Investment Scheme (EIS) tax relief: 50% of the value of shares for SEIS or 30% for EIS can be claimed back against income tax.

KEY CHALLENGES

- Cost
- Though generally supportive Edinburgh City Council caused delays through lengthy processes

KEY BENEFITS

- Generation of green electricity
- Income generation to fund local community initiatives
- Educational benefits
- Community involvement



ENVISIONING A BRIGHTER FUTURE NEILSTON COMMUNITY WIND FARM

Location Neilston

Community Local population of 5,500 represented through NDT

Type of energy project Wind farm

Stage of development Implemented

BACKGROUND

The Neilston Development Trust (NDT) started negotiations with potential partners to develop a wind farm as early as 2006. Three years later, the Neilston Town Team published the "Neilston Renaissance: Town Charter", a visionary document outlining over 40 projects to improve the future of the town including "wind turbines to generate clean electricity [and] potentially bringing income for the community".

LEGAL STRUCTURE & SET-UP

Neilston Community Wind Farm is a Limited Liability Partnership owned by Neilston Development Trust (via its trading subsidiary NDT Trading) and Carbon Free Neilston Ltd., a subsidiary of commercial wind farm developer Carbon Free Developments Limited.

The hills around Neilston provide some of the best wind resources in Scotland. NDT chair Alan Walker says: "We fully support the move to renewable energy but at the same time we felt that the community should benefit in monetary terms. It was almost certain that wind farms would be built near the village and the only way to be involved was through a partnership with a developer."

Neilston Development Trust owns 28% of the 10MW development, which opened for business in May 2013 and operates four commercial turbines. Neilston Development Trust is a Limited Company by Guarantee with a charitable status that will distribute the income generated through the Wind Farm to help turn the vision outlined in the Town Charter into a reality and make Neilston "a better place".

// We fully support the move to renewable energy but at the same time we felt that the community should benefit in monetary terms. It was almost certain that wind farms would be built near the village and the only way to be involved was through a partnership with a developer.

Alan Walker - NDT Chair



Photo: Simon Murphy





FINANCING

NDT benefitted greatly from the expertise of the developer and the fact that CFD carried the financial risks at the early stages of the project. Once the project was sure to go ahead, NDT were allowed but not obliged to invest up to 49.9% of the wind farm and managed to raise funds to secure a 28% ownership stake by borrowing from social lenders and the Scottish Government.

Over the lifespan of the wind farm, NDT will earn an estimated £10 million to fund local community projects. This is significantly greater than so called 'community benefit payments' commonly handed out by large developers of wind farms in Scotland.

KEY CHALLENGES

- Finding a commercial partner
- Raising the investment finance
- Community engagement

KEY BENEFITS

- Provides an excellent source of community income for minimal effort
- Empowers the community
- Gives community a sense of ownership and involvement in fighting climate change



POWERING BUSINESS AND COMMUNITY BRIGHT GREEN HYDROGEN

Location Methil Docks Business Park, Fife
Community Social enterprise and potentially other local organisations and individuals
Type of energy project Community transport, storage and wind power
Stage of development Implemented

BACKGROUND

Located at Methil Docks Business Park, Bright Green Hydrogen set up a system, which operates a 750kW wind turbine that distributes electricity through an on-site mini-grid to different buildings in the business park. Excess electricity is either sold to the national grid (from where electricity can also be bought into the system) or fed into an electrolyser which produces hydrogen by splitting water (H₂O) into hydrogen (H₂) and oxygen (O₂). The hydrogen is stored in a

tank and fed into a hydrogen fuel cell when additional electricity is required. There the fuel cell combines hydrogen and oxygen (from the air) and so produces electricity with water as a by-product.

A control system automatically diverts 30kW of excess wind energy to the electrolyser when the wind turbine runs at an average of 80kW over 10 minutes or more and cuts the electrolyser off when the output drops below this. In turn, the fuel cell kicks in

// The Hydrogen Office and FS&SS are playing a vital role in demonstrating the link between Scotland's renewable energy resources and the role that fuel cells and energy storage can play in low carbon Scotland.

Fergus Ewing -
Scottish Energy Minister



Photo: Fife Shopping and Support Services



during business hours when the wind turbine produces less than an average of 10kW over 10 minutes and automatically switches off when output rises over this threshold.

The fuel cell is also connected to a public electric vehicle charging station which is used by Fife Shopping & Support Services (FS&SS), a non-profit company that provides shopping and pension collection services to local people who are frail or disabled.

Scottish Energy Minister Fergus Ewing said: "The Hydrogen Office and FS&SS are playing a vital role in demonstrating the link between Scotland's renewable energy resources and the role that fuel cells and energy storage can play in low carbon Scotland."*

LEGAL STRUCTURE & SET-UP

Bright Green Hydrogen is one of three trading bodies of Business Partnership, a company limited by guarantee. Fife Shopping & Support Services is a limited company by guarantee, registered with a charitable status. A verbal agreement allows FS&SS to charge their van for free.

FINANCING

The £450,000 (€560,000) of funding required for the hydrogen storage and a further £1.6 million (€2 million) for the wind turbine came through grants from a variety of sources including the European Regional Development Fund, Scottish Enterprise and Business Partnership Ltd.

* Ross, D. (2011) Pioneering wind-powered van helping pensioners. The Herald, 30 September

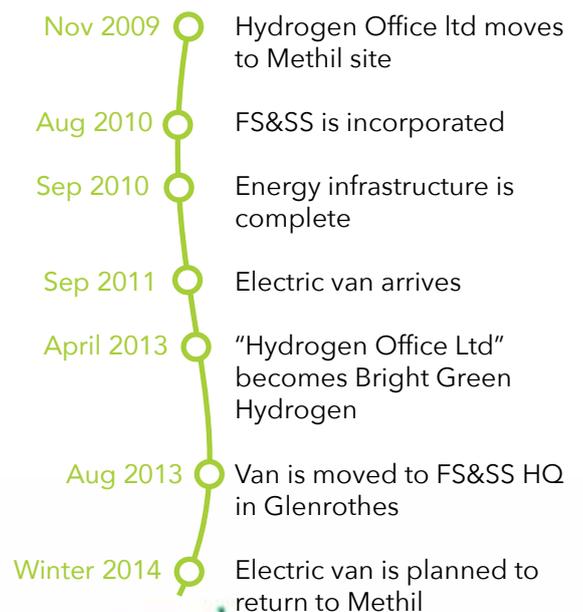
FS&SS secured grant funding through the Scottish Governments's Community and Renewable Energy Scheme (CARES) and were the first organisation in Scotland to do so for the purchase of an electric vehicle. In addition to nearly £14,000 (€17,500) CARES funding FS&SS received support from Fife Council and BRAG Enterprises. It is estimated that the electric vehicle will save the charity £1,500 (€1,900) per annum.

KEY CHALLENGES

- Securing funding
- Due to decline of services in the Methil area and lack of electric charging points in areas with higher FS&SS service uptake the van was out of operation for parts of 2013/2014

KEY BENEFITS

- Cost savings for community transport service
- Linking renewable electricity generation with storage and sustainable transport



COMMUNITY TRANSPORT FETLAR ELECTRIC MINIBUS

Location Fetlar, Shetland

Size of community Local population 81

Type of energy project Community transport

Stage of development Partially implemented

BACKGROUND

As a remote island in Shetland, Fetlar is faced with a number of challenges including access to energy. For example, there is no fuel station on Fetlar, forcing most islanders to leave the island in order to re-fuel motorised vehicles which increase cost and transport related carbon emissions. When the local post office suspended the service of its 'post bus' which also functioned as a community vehicle, the islanders came up with the idea to replace it with a community owned electric minibus to provide a 'dial a ride service'.

As the first phase of the Fetlar's Green Energy scheme, the Fetlar Electric Minibus started operation in July 2013. The minibus can carry eight passengers plus driver and has been modified to accommodate two wheelchair

passengers. As a second phase the islanders hope to install two 20kW wind turbines to supply the vehicle, making the system virtually carbon free. However, the local grid is at capacity, which makes adding new generating capacity difficult. Rather than exporting electricity to the grid, the plan is therefore to use excess energy to provide heating for the local nursery and primary school.

Fetlar is promoting a holistic approach to sustainable energy development on the islands. In addition to the electric minibus this includes measures to reduce domestic energy consumption, promote local food production in order to reduce food miles and provision of further electric vehicle charging points.





LEGAL STRUCTURE & SET-UP

The Fetlar Electric Minibus is operated by R. G. Jamieson and Son in partnership with Fetlar Development Ltd. Fetlar Development Ltd is a company limited by guarantee and registered with a charitable status. The company, which was established in 2008 to address economic challenges and depopulation of the island, is governed by nine voluntary directors and currently employs 1.5 members of staff including a Development Worker. R.G. Jamieson & Son is a commercial company that operates a Dial-a-Ride service on Fetlar now using the electric minibus though the vehicle may also be used by Fetlar Development Ltd outside of service hours.

FINANCING

In 2010 Fetlar Development Ltd was unsuccessful in securing funding from the Climate Challenge Fund, a Scottish Government programme that funds community initiatives to tackle climate change. However, the community did not give up and eventually managed to secure funding from a number of sources including Transport Scotland, LEADER, Shetland Island Council, R.G. Jamieson & Son, an interest free loan from the Energy Saving Trust and interest free bridging finance from the Shetland Charitable Trust.

More recently Fetlar Development Ltd secured around £100,000 (€125,000) through the Scottish Government's Community and

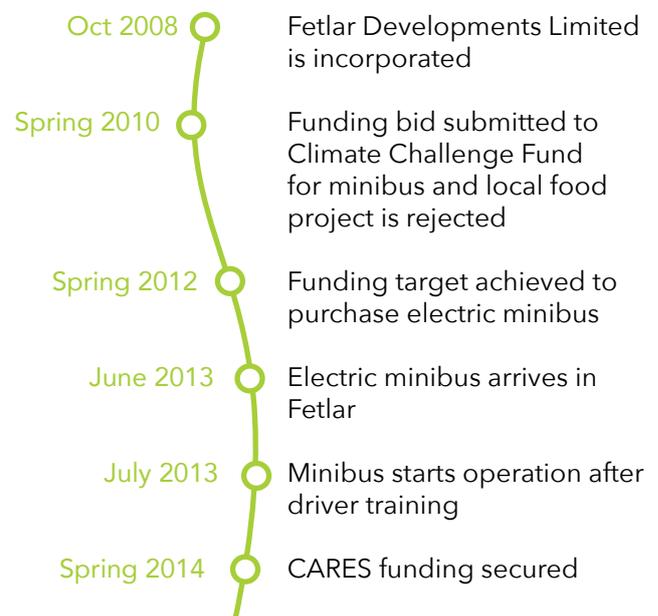
Renewable Energy Scheme (CARES) towards the energy use part of phase two but a funding route for the turbines has yet to be found.

KEY CHALLENGES

- Access to funding
- Grid constraints

KEY BENEFITS

- Affordable and convenient transport
- A step towards energy sovereignty
- Decreased dependence on high-carbon fuels



FIGHTING FUEL POVERTY ABERDEEN HEAT & POWER LTD

Location Aberdeen

Size of community 1600 flats

Type of energy project District Heating

Stage of development Implemented

BACKGROUND

As a local authority, Aberdeen City Council is responsible for 4,500 flats in 59 multi storey blocks across the city. In 1999 Aberdeen City Council adopted its Affordable Warmth Strategy and carried out a survey of their housing stock which showed that a large number of tenants lived in 'fuel poverty'* due to high energy bills resulting from low energy efficiency standards.

In response Aberdeen City Council established 'Aberdeen Heat & Power' (AH&P) to deliver Combined Heat and Power (CHP) schemes for the city. As a first project AH&P developed a CHP system for four blocks of flats or 268 domestic dwellings at Stockethill. Subsequently the not-for profit company took on 209 flats in Hazlehead, 503 flats at Seaton as well as an array of community buildings that have been attached to the systems.

According to former council leader Barney Crockett "Aberdeen Heat and Power is a true success story in every sense. The company's combined heat and power scheme has taken hundreds of people in Aberdeen out of fuel poverty by providing affordable heat in many homes, and simultaneously making significant cuts to the city's carbon output."

LEGAL STRUCTURE & SET-UP

In 2002 Aberdeen Heat & Power Ltd was incorporated as a company limited by guarantee. The company operates as not-for-profit and is governed by a board of ten directors that is open to tenants and includes two mandatory council representatives.

District Energy Aberdeen Ltd (DEAL) was set up as an AH&P subsidiary in 2013, enabling to connect commercial customers.

* Households are in 'fuel poverty' when 10% or more of household income is spent on energy bills

// Aberdeen Heat and Power is a true success story in every sense. The company's combined heat and power scheme has taken hundreds of people in Aberdeen out of fuel poverty by providing affordable heat in many homes, and simultaneously making significant cuts to the city's carbon output.

Cllr Barney Crockett - Former
Leader of Aberdeen City Council //

FINANCING

The total cost for the initial development at Stockethill was £1.6 million (€2 million). £730,000 (€910,000) of the required capital cost came from the Community Energy Programme, a UK government scheme that ran for two years and closed in 2007. The Community Energy Programme is a good example of how funding opportunities are in constant flux and often only run for relatively short periods of time. As a result it was not possible to replicate the financing of Stockethill and the other schemes that followed.

In order to navigate through the ever changing funding climate, Aberdeen City Council leads on new funding applications and the prioritisation of projects. At the same time AH&P hopes to diversify its funding streams by charging commercial customers and feeding profit back into AH&P.



AH&P charges Aberdeen City Council for connection of every household. The council in turn charges households at a fixed rate, which is set by AH&P and reviewed annually. The aim is to provide affordable warmth and alleviate fuel poverty. In that regard household savings are estimated at 25-40%, keeping in mind that many households previously under-heated their homes.

With connection charges paid by the city council, AH&P would be able to sustain itself in terms of operation and maintenance. However, without further access to capital funding, expansion and a planned move away from gas to non-fossil fuel sources would be put in jeopardy.

KEY CHALLENGES

- Changing and short-lived opportunities for capital funding

KEY BENEFITS

- Drastic reduction of fuel poverty through 50% reduction of fuel cost
- 45% reduction of carbon emissions in buildings supplied by AH&P



TIDAL POWER BLUEMULL TIDAL ENERGY LIMITED

Location Yell, Shetland

Size of community Local population of approx 1,000 represented through NYDC

of energy project Tidal installation

Stage of development Implemented

BACKGROUND

Bluemull Tidal Energy Limited operates the world's first community owned tidal generator. The 30kW turbine which started to generate electricity in March 2014 is installed in a tidal stream between the Shetland Islands of Yell and Unst. In an approximate depth of 100ft (30m) the three bladed turbine is powered by the tides and feeds electricity onshore through a 0.6 mile (1km) subsea cable. Electricity generated is expected to provide power for up to 30 homes, a nearby ice plant and Cullivoe Harbour Industrial Estate in North Yell.

Simon Forrest of Nova Innovation, the company that designed, built and installed the turbine, declared: "We are delighted to announce that the Nova 30 tidal turbine has been successfully deployed and is

// We are delighted to announce that the Nova 30 tidal turbine has been successfully deployed and is generating electricity to the grid. It marks a major achievement for the wider Scottish tidal industry with over 80 per cent of Nova's supply chain Scottish based //

Simon Forrest - Nova Innovation

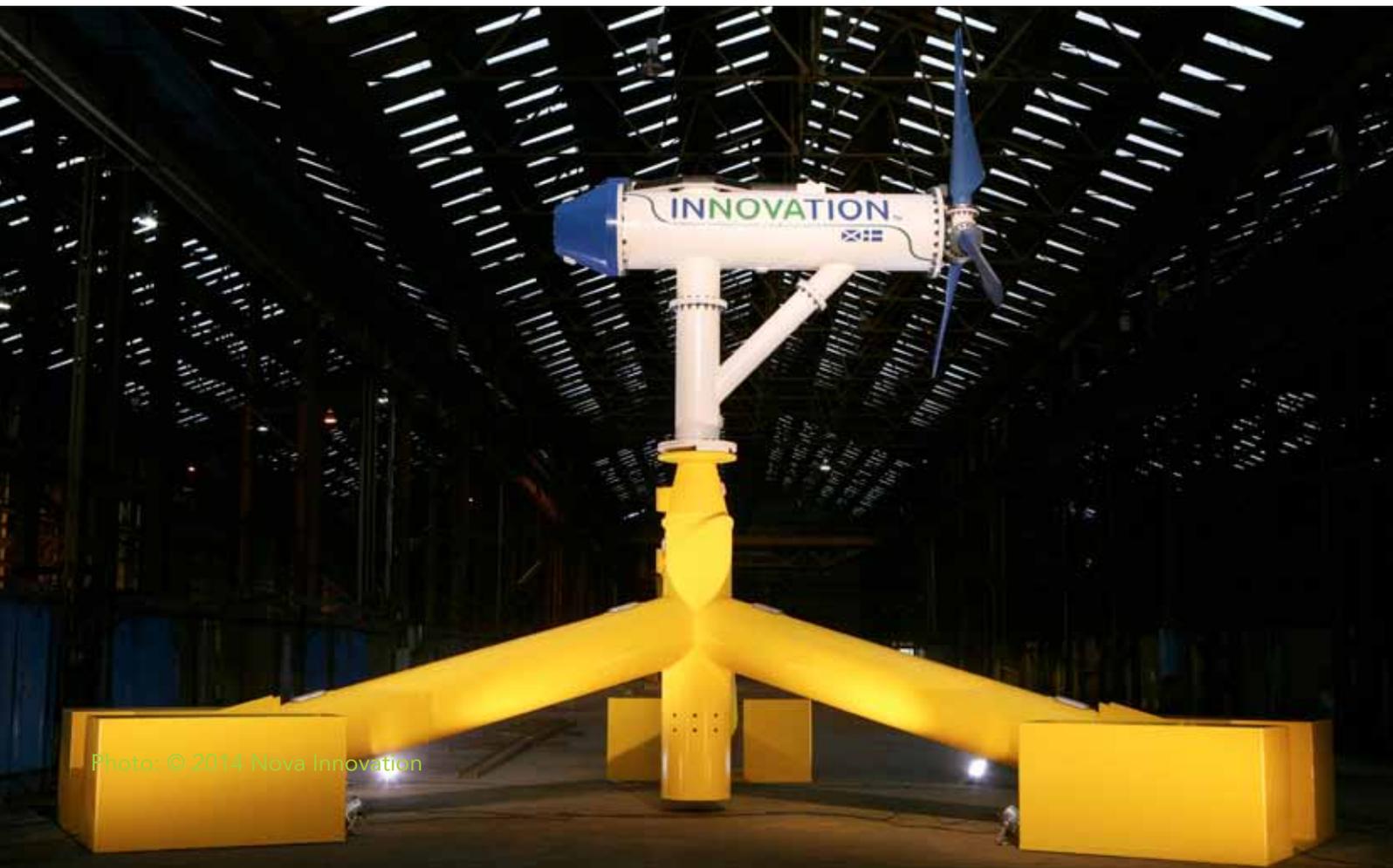


Photo: © 2014 Nova Innovation



generating electricity to the grid. It marks a major achievement for the wider Scottish tidal industry with over 80 per cent of Nova's supply chain Scottish based."

The project was developed in partnership North Yell Development Council (NYDC), a local community development organisation that aims to create income streams to regenerate the local economy. NYDC is also developing a local wind farm.

LEGAL STRUCTURE & SET-UP

The turbine is owned by Bluemull Tidal Energy Limited, a private limited company and a subsidiary of the NYDC. North Yell Development Council is a company limited by guarantee, registered with charitable status and one of the oldest community development organisations on Shetland.

FINANCING

The project was financed through the Scottish Government's Community and Renewable Energy Scheme (CARES), Shetland Island Council and NYDC. With funding from Highlands and Islands Enterprise, Shetland Islands Council and LEADER, NYDC was able to appoint a project manager in Spring 2013.

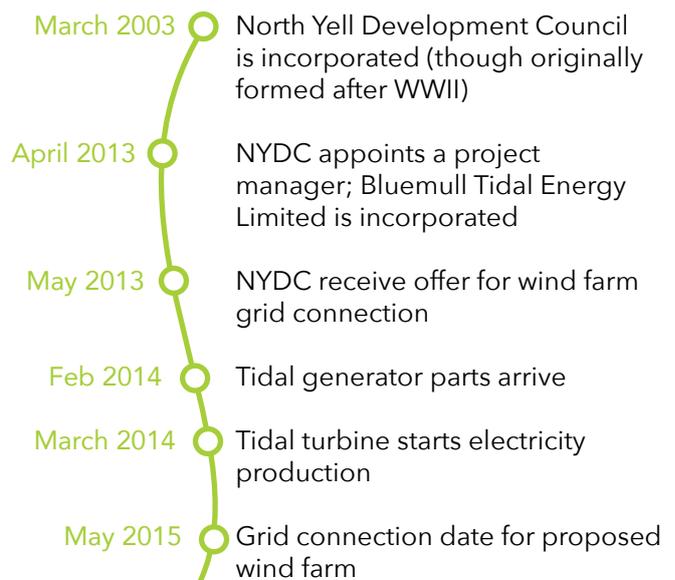
NYDC will generate income through the direct sales of electricity and through feeding excess into the local grid.

KEY CHALLENGES

- Securing funding for a relatively new technology

KEY BENEFITS

- Setting precedent for community ownership of a relatively new technology
- Predictable electricity supply



COMMUNITY CAR CLUB FINTRY ENERGY EFFICIENT TRANSPORT

Location Fintry, Stirlingshire

Size of community 30 car club members in a community of 700 residents

Type of energy project Community Transport

Stage of development Implemented

BACKGROUND

Well known for its 'virtual ownership' of a wind turbine, the village of Fintry has been at the forefront of community energy in Scotland for many years. However, investing in renewable electricity generation is not the only challenge the town's 700 residents face in working to combat climate change. Fintry, which is located approximately 16 miles (26km) from Stirling and 20 miles (32km) from Glasgow, has not had access to regular public transport for more than two decades. Consequently many households in Fintry own more than one car.

To provide an affordable and practical alternative to car ownership, community members established the Fintry Energy Efficient Transport (FEET) car club in 2011. FEET currently has access to three cars, including one electric vehicle, servicing 30 members. Since joining FEET, five members have given up their second or primary car.

FEET member Kayt Howell says "With no public transport in Fintry, residents have a high dependency on cars. We sold our second car when both my husband and I joined the car club... . We've saved considerable sums on the costs of maintaining and insuring another

// With no public transport in Fintry, residents have a high dependency on cars. We sold our second car when both my husband and I joined the car club... . We've saved considerable sums on the costs of maintaining and insuring another vehicle. The car club offers us a choice of car size to suit need and preference.

Kayt Howell - FEET member





vehicle. The car club offers us a choice of car size to suit need and preference.”*

LEGAL STRUCTURE & SET-UP

FEET car club is run by Fintry Development Trust (FDT), which is registered as a company limited by guarantee with charitable status and governed by a board of eight directors. Car club membership is granted against a membership payment and by meeting certain criteria including a minimum of two years driving experience. FEET uses the billing and booking services provided by Moorcar, a co-operative made up of community owned car clubs across the UK. FEET membership also comes with automatic membership in Cycle Fintry, a bike rental service, also provided through FDT.

FINANCING

A number of different membership options are available when joining FEET, including a £60 per annum household and organizational membership and £20 short-term membership for two months. A second household or company member added is eligible for a 50% discount. Therefore members save on the general maintenance and car insurance.

After the first hour, members are charged in half hour increments paying a maximum of

£21.60 per day. Instead of paying for fuel, members are charged per mile traveled and use a fuel card to refuel at petrol stations.

FEET car club was awarded a Nissan Leaf electric vehicle through the Scottish Government’s Developing Car Clubs Scotland EV programme.

KEY CHALLENGES

- Shifting mindset about car ownership

KEY BENEFITS

- Affordable and practical alternative to private car ownership
- Reduction of carbon emissions
- Expansion to include bicycles



* Eastwood, M., Kidd, M.C. (2013) The benefits of developing car clubs in Scotland. Edinburgh, Carplus Trust



COMMUNITY OWNERSHIP THROUGH COMMUNITY BENEFITS BEINN MHOR WIND FARM

Location Beinn Mhor, near Tomich, Strathglass
Community Local population approx. 2,600
Type of energy project Wind farm
Stage of development In planning

BACKGROUND

wpd Scotland, a commercial wind farm developer, is proposing to build a 7 turbine wind farm with a generating capacity of up to 21MW near Tomich in the Scottish Highlands. It is estimated that the wind farm will generate enough electricity to supply 11,500 households and save around 527,000 tonnes of carbon emissions through the 25 year lifetime of the project.

The proposed wind farm is located near existing infrastructure including power lines and roads and environmental impact during construction is expected to be kept to a minimum. The project is currently awaiting

planning permission but has already secured grid connection allowing export of electricity to the national grid from October 2016.

wpd have offered the local communities an option to invest in the Beinn Mhor wind farm through Soirbheas, a local charity, that operates in the areas of Strathglass and Glen Urquhart. Soirbheas was established to benefit from the Corrimony Wind Farm, an earlier wind project in the area. The objectives of the organisation include improving the energy efficiency of housing in local communities and protecting the environment for future generations.



Photo: Soirbheas



LEGAL STRUCTURE & SET-UP

wpd Scotland is a company limited by guarantee which aims to offer community investment for developments of five or more turbines. Soirbheas is a company limited by guarantee registered with charitable status and run by a voluntary board of directors.

Given the sensitivity of the site, the group is pleased that the planning application for the Beinn Mhor wind farm has received no objections from the statutory consultees, including Scottish Natural Heritage and the Scottish Environment Protection Agency.

So far wpd Scotland and Soirbheas have signed a Memorandum of Understanding to explore how the two organisations could co-operate. This is due to be followed by an 'option to invest' agreement in the coming months.

If the development goes ahead, it is proposed that wpd Scotland will operate the wind farm, while Soirbheas will own a one-seventh equity stake or the equivalent of one turbine.

FINANCING

The Scottish Government Register of Community Benefits from Renewables is a voluntary register that encourages commercial wind farm developers to provide £5,000 (€6,250) per MW of installed capacity to local communities that host the developments. Unlike other developers wpd Scotland does not simply want to hand money over to a

local community organisation on an annual basis but is exploring the option of paying community benefits (at the Net Present Value) for the lifetime of the wind farm up-front, enabling Soirbheas to buy a stake in the wind farm.

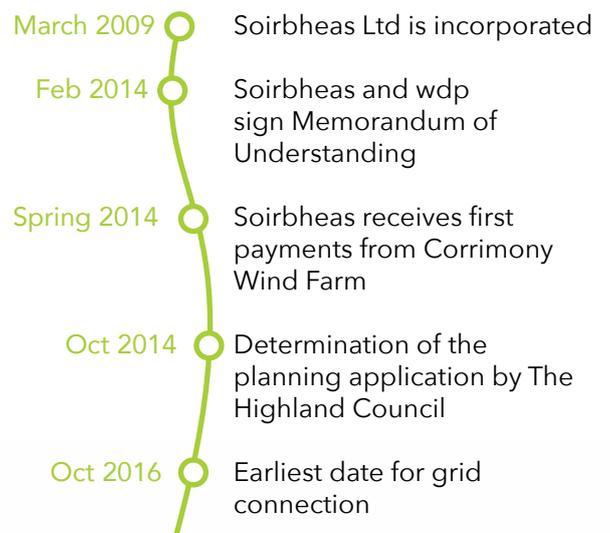
In turn Soirbheas gives out grants to community projects but also uses some of the money directly to run initiatives such as its Green Living Project.

KEY CHALLENGES

- Addressing the concerns of local residents
- Communicating the key facts of technically complex studies

KEY BENEFITS

- Generating of green electricity in close proximity to existing grid infrastructure
- Income generation to help meet Soirbheas' vision of a growing, greener and more vibrant community



OFF-GRID LIVING SCORAIG WIND ELECTRIC

Location Scoraig

Community Average of 70 local residents, global outreach

Type of energy project DIY/off-grid wind

Stage of development Implemented

BACKGROUND

Like others, Hugh Piggott moved to Scoraig, a remote peninsula in the north-west of Scotland, in the 1970s to permanently live off-grid; a lifestyle he had enjoyed during holidays as a child. While he initially relied on an oil lamp for light, this became impractical as his own family grew. Some neighbours already made use of the local climate, which favours wind generators to produce electricity and soon Hugh Piggott began his obsession with wind generators that continues to this day. Over time his wind turbines evolved from contraptions assembled from recycled parts to carefully designed wind generators using rare earth magnets.

Today households and the local school on Scoraig are served by approximately 30 turbines ranging in size from 500 watts to

6kW (or 2.4-5 metres in diameter). Most have been built from scratch locally, some are factory manufactured Proven machines, ten or so machines were designed by Hugh but originally built in Zimbabwe and one turbine was given to Hugh by a colleague from South Africa. As there is no grid infrastructure, electricity is saved in individual battery banks, often backed-up by diesel generators. There are also an increasing number of solar photovoltaic installations to complement electricity generation from wind but only a few buildings use hydro power or solar thermal to heat water.

LEGAL STRUCTURE & SET-UP

Scoraig Wind Electric is the name Hugh Piggott uses for his business activities as a sole trader. In terms of income generation his main business is the sale of equipment



Photo: Anne Schiffer



// ... the wind turbines we install [in Palestine] are “home-brewed”. We build them ourselves based on the Hugh Piggott model. This way we not only reduce costs of production and maintenance, but are also able to continuously improve reliability and efficiency and adjust the systems to the conditions on the ground.

2010 Annual Report - Comet-ME





such as batteries and inverters and to a lesser degree installation and maintenance work on Scoraig. However, this is actually a small part of what Hugh does and subsidises his other work. Hugh's passion for wind over the past four decades encompasses a wide range of activities that includes the design of small wind generators, sharing his skills through workshops on how to build small wind turbines or generally helping people with hands-on renewable technology. He has also written a number of publications including his 'A Wind Turbine Recipe Book'.

Through Hugh's involvement in international projects and the people that have adapted his designs around the world, an international network has emerged that is formalised by Wind Empowerment, an "association for the development of locally built small wind turbines for sustainable rural electrification".*

FINANCING

In the spirit of self-reliance people on Scoraig take responsibility for financing energy systems themselves. The notion of waiting for government funding streams to become available is not on the agenda. It is therefore not surprising that none of the approximately twenty households on Scoraig have applied for off-grid Feed-in Tariffs, which is associated with 'too much fuss' regarding administration and installation of metering equipment.

* For more information visit www.windempowerment.org

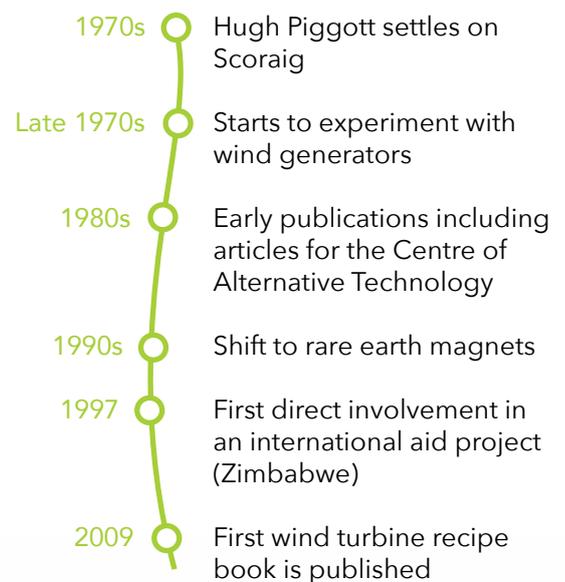
To reduce cost, second-hand equipment such as batteries may be utilised and of course people do not shy away from learning the necessary skills to carry out work themselves. Systems are typically upgraded every 10-20 years while battery banks are more likely to be replaced every five years.

KEY CHALLENGES

- Unrealistic expectations by those new to small wind generators of the amount of money they can save

KEY BENEFITS

- Provides electricity for those who enjoy living off-grid
- Enjoyment of learning and passing on practical skills
- Adaptation of small DIY turbines around the world



RECOMMENDATIONS SUMMARY

In response to the challenges and opportunities identified above, we propose the following recommendations:

1 COMMUNITY ENERGY TARGETS

In order to enhance investor certainty and align national and local development objectives with high climate and energy ambition for 2030:

Scotland should raise its ambition for 'local and community owned' energy by increasing its 2020 target and setting an ambitious target for 2030;

Local authorities should demonstrate leadership by developing local community energy targets in order to guide and support the future development of local regulations for community energy.

2 EQUITABLE GRID ACCESS FOR COMMUNITY PROJECTS

In order to ensure that community projects are able to overcome particular barriers to grid access, so that they can compete effectively on an equal basis with large developers:

Connection charges to the distribution grid should be capped;

Community groups should not be required to pay for the costs of reinforcing the grid. Reinforcement costs should fall on the grid operator as part of a continuing duty to ensure integration of renewables and ensure security of supply. Alternatively, community groups should be provided with the option to pay for reinforcements through staged payments so that the majority of costs occur after the project is commissioned;

Eligible community projects should be able to be provided with reserve capacity where

there is a demonstrated need and/or demand. Alternatively, there should be a continuing duty on the grid operator to connect all eligible installations, similar that which exists in Denmark.

3 ENABLING COMMUNITY PROJECTS TO BECOME LICENSED SUPPLIERS

In order to enhance competition in the UK electricity supply market and to allow small and local enterprises to enter the market for green sustainable energy:

Administrative costs and timelines associated with becoming a fully licensed utility under the Standard Conditions of Electricity Supply Licence should be streamlined and/or reduced to create a level playing field for new market entrants that are willing to supply green energy to consumers;

Licence Lite should be reformed to ensure that community projects are able to enter into beneficial supplier service agreements (SSAs) with third party suppliers. This should include an obligation for fully licensed suppliers to enter into SSAs.

An incentive scheme should be developed to encourage local direct marketing and supply that results in little or no use of the public distribution grid, such as eligibility for reduction in transport tariffs or other energy tax charges (e.g. VAT) for directly-marketed electricity.

The Electricity (Class Exemptions from the Requirement for a License) Order 2001 should be broadened and clarified so that community projects can directly supply consumers without having to apply for a license under section 4(1)(c) of the Electricity Act 1989.



Photo: Hugh Piggott

This is a Friends of the Earth Scotland publication on behalf of the Scottish Community Energy Coalition and the Community Power project. For more information visit www.foe-scotland.org.uk or www.communitypower.eu

SCOTTISH COMMUNITY ENERGY COALITION MEMBERS



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**The Scottish
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