

Renewables

An Introductory Guide for Community-Led Projects



Overview

In Scotland there are 77 community organisations that between them have capacity to generate 82MW of electricity from renewable sources.* The most significant proportion of these are wind and hydropower systems, reflecting the natural resources available.

Community-led renewable energy projects have a diverse range of objectives. It's important to consider if these are right for your community:

- To provide a long-term source of income to the local community;
- To supply electricity or heating to a community building or other asset to reduce running costs;
- As an energy source where there is no grid connection;
- To support Scotland's Just Transition to Net Zero.

There are a range of renewable and low carbon energy technologies available. These include two types of solar panels (thermal solar panels use the sun to heat water and solar PV produce electricity), water or hydro turbines and wind turbines. Heat pumps or biomass fuels such as wood can be considered as a heating solution. There have been

some community projects using hydrogen fuel cells but these have been largely experimental.

Systems that generate electricity are generally connected to the national grid and a payment is received for the energy exported. However, as battery prices reduce and their efficiency improves, the option to store electricity for use on site is attracting greater interest. Some projects have created a local mini energy company to supply electricity or heat to local consumers. These can be used to help tackle fuel poverty and benefit local consumers through advantageous rates. Community involvement can range from outright ownership via community benefit cooperatives (BENcoms), a development trust or other community company, to shared ownership schemes. The latter can give the community a stake in a large-scale local development such as a wind farm.

Community-led Local Energy Plans are developed by local people to identify existing and future energy needs for power, heat and transport. They can be used to assist practical actions to influence and support future developments.

Starting Points

1. Selecting your tech:

Selecting a suitable technology for your situation will depend on a range of factors including the renewable resources available on your site, access and location of the site, your energy needs, finance available and the options for using any surplus energy generated. Some renewable energy installations will require planning consent, so early contact with the local planning department is recommended. The potential costs and financial returns of a renewable energy system will vary greatly. Larger systems tend to be cost effective for each unit of electricity generated but will have high capital costs.

2. Common renewable energy options:

Hydropower: this can be a good option where there is a reliable flow of water with sufficient volume and drop in height. The technology is proven and reliable. Plus, short term and seasonal

variations in the energy produced tend to be less than for wind or solar.

Solar photovoltaic (PV) panels require a suitable location for mounting the panels that is unshaded and facing a southerly direction. The overall system is made up of a number of individual panels so can be sized to suite the space available. Larger schemes tend to be mounted on frames at ground level, smaller schemes on a roof.

Wind turbines: Smaller wind generators can be considered for remote sites where there is no grid electricity supply and a relatively small amount of power is required. Larger wind turbines are a significant investment so careful planning and design is required. There are several regulatory issues that have to be addressed including planning and environmental impact assessments.

3. Assessing the resource available:

A site survey will often be needed to assess the resource availability, design the system, estimate the amount of energy produced and assess the financial viability of the proposed installation. For larger wind and hydro projects site resource monitoring over an extended (12 month) period may be required. Solar energy calculators can be used to give an estimate of the benefits you may see from installing a solar PV system.

4. Connecting to the grid:

Connecting your system to the mains electricity grid provides a use for the energy produced and will generate income. The feasibility of this will depend on identifying a suitable connection point that is within easy access of your site. Cabling costs and energy losses will increase as the distance from the connection point to site extends.

STARTING POINTS Cont.

The Smart Export Guarantee is a mechanism that ensures small-scale generators are paid for the renewable electricity they export to the grid. Solar PV, wind turbines, hydropower and anaerobic digestion installations up to 5MW are eligible. Micro combined heat and power systems up to 50MW also qualify. The rate paid is set by the energy company you are selling to; there is no guaranteed minimum price.

5. On site use and storage:

It may be feasible to store and use the electricity or heat generated by your renewable system on site. The energy produced can be stored by heating water or in batteries. Batteries have been expensive, but battery technology is improving, and their use is becoming

more viable. Highly insulated hot water tanks are also widely available. Using the energy yourselves can lead to costs savings but the cost of the storage system should be factored in.

6. Heat pumps for space heating:

Heat pumps are becoming increasingly popular for heating homes and buildings. The two most common types are ground source heat pumps and air source heat pumps.

Ground source heat pumps extract heat from underground so tend to be more effective as the ground has a more constant temperature than the air and will be warmer in the coldest months. However, the installation of a ground source heat pump entails significant

ground works and requires good access, meaning it can be more appropriate on a new build site or where significant ground works will take place for other reasons. An air-source heat pump is like a large ventilation unit and can be mounted in a convenient location outside your building.

All heat pumps use electricity to operate. However, the amount of heat produced is greater than the amount of electricity used to provide it, commonly around three times as much. The heating systems that are used with a heat pump have distinct characteristics and it is critical to ensure that they will meet the requirements and demand pattern of the space to be heated.

Funding for Renewables Projects

The Scottish Government's **Community and Renewable Energy Scheme** (CARES) offers early-stage enablement grants and loan and/or grant capital funding to communities developing renewable energy, heat decarbonisation and local energy system projects.

Good Finance has a directory of organisations that provide social investment (loan) funding.

Foundation Scotland has details of the community benefit funds that they manage on behalf of or with the local community.

Case Studies

Linlithgow Community Development

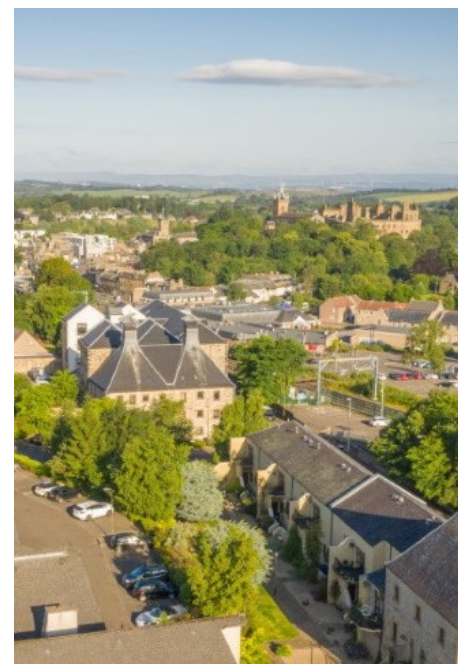
Trust: Community Bonds were used to raise money to install solar panels on community buildings. The panels provide cheap electricity for the clubs involved, pay back bond holders and in time will generate income for LCDT.

Crossdykes Shared Ownership

Communities in East Dumfriesshire worked closely together and extensively consulted local people on an opportunity to undertake shared ownership of Crossdykes Windfarm. By working closely with CARES and Local Energy Scotland, the community invested 5%, secured against part of the community benefit

funds alongside revenue from the shareholding. In 2022, the developer decided to sell Crossdykes wind farm. Although the community had the option to keep their shares and partner with the new owner, they decided it was lower risk to sell, subsequently received a substantial seven-figure sum from the sale of its stake in the wind farm. This allowed them to pay off their investment loan immediately, making a substantial profit which they can use to invest in other local developments.

Eigg Electric is an example of a community wide off-grid electricity supply and distribution system.



Further Information and Advice

Organisation	Remit	Community Focus	Case Studies	Technical Information	Networking Opportunities	Funding Information
<u>Local Energy Scotland</u>	Delivers the Scottish Government's Community and Renewable Energy Scheme (CARES) and has information on current funding, best practice guidance and provides ongoing support and mentoring. It is the starting point for advice on community renewables. It will advise on the development of Local Energy Plans. There are officers that cover the Scottish Borders and Dumfries & Galloway.	✓	✓	✓		✓
<u>Community Energy Scotland</u>	Provides support for community renewable energy and decarbonisation projects. Has trialled various innovative schemes. Provides project management services, feasibility assessments, advice on procurement and funding. Derives its income through fees payable from grants or loans secured by project groups.	✓	✓	✓		✓
<u>Energy Saving Trust</u>	Has lots of information on renewables, funding and technical aspects including a Solar Energy Calculator that can predict how much you might generate from a solar PV system. There is a list of certified installers.		✓	✓		✓
<u>Forestry and Land Scotland (FLS)</u>	Has enabled the development of renewable energy schemes on its land. Communities can apply under the asset transfer regulations to purchase land for renewables projects. Since 2010 FLS has made Community Benefit and a shared ownership offer mandatory on renewable energy sites on its estate.					
<u>Scottish Renewables</u>	Is the renewables industry body that provides representation, events, publications and networking.				✓	

South of Scotland Enterprise (SOSE) is the economic and community development agency for Dumfries and Galloway and Scottish Borders. We offer support, funding and specialist knowledge to help community initiatives and social enterprises across the South of Scotland to grow and achieve their aspirations. To contact SOSE:

- Go to <https://www.southofscotlandenterprise.com/contact-us> and fill in the enquiry form
- Call 0300 304 8888

