



CARES CASE STUDY

CANNA RENEWABLE ENERGY AND ELECTRIFICATION

BACKGROUND

The Isle of Canna is the westernmost of the Small Isles archipelago, in the Scottish Inner Hebrides. The small island is four miles long and a mile wide, and is linked to the neighbouring island of Sanday by a road and sandbanks at low tide. Less than 20 people live on the island, which is in the care of the National Trust for Scotland (NTS). It was gifted to the Trust in 1981 by its then owner John Lorne Campbell and his wife, Margaret Fay Shaw, and is still run as a farm with a traditional Hebridean community as John Campbell requested.

The NTS originally provided electricity from diesel generation and a small grid. This was supplied at no cost to residents but was very expensive for NTS, so for the last few years residents have been paying for their electricity.



Credit: Gerry MacKinnon

- Project owner: Isle of Canna Community Development Trust (IoCCDT)
- Location: Isle of Canna, Scottish Inner Hebrides
- Technology: Onshore wind, solar PV, battery storage
- CARES funding: £10,000 Enablement Grant, £150,000 from Infrastructure & Innovation Fund
- Date installed: October 2018

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PROJECT AIMS

The Isle of Canna Community Development Trust (IoCCDT) was set up in April 2013 to encourage sustainable demographic growth, supported by good employment opportunities, services, facilities and affordable housing. The Trust provides a focus for the administration of community projects and a way to manage assets for the community. All Canna residents are encouraged to get involved and to share in the work of being a director.

NTS was always keen for the community to take over ownership and running of the electricity scheme. In the Isle of Canna Community Development Plan, 2013 to 2018, there were plans for the community to establish a renewable energy supply. The plan reads, "For island living to be attractive to new families, reliable, cheaper and greener energy alternatives must be explored". The Canna Renewable Energy and Electrification (CREE) project aimed to dramatically reduce noise, pollution and carbon emissions on Canna, which has no connection to the National Grid.

A feasibility study in 2009 found a hybrid system of wind, solar and battery storage would be a viable option for the island. Detailed design was carried out in 2015 and planning permission was secured by early 2016, then project funders were approached.

Capital costs for the project were around £1.2 million, with around £1 million coming from the Big Lottery Fund. IoCCDT also applied for a CARES Enablement Grant of £10,000 towards project management and to the Infrastructure and Innovation Fund for £150,000 towards total project costs, including a battery bank, battery inverters and demand-side management control equipment.

Other funding came from SSE's Highland Sustainable Development Fund, Highlands and Islands Enterprise and the National Trust for Scotland, both in terms of a financial contribution and the lease of the network which allowed the project to go ahead.

The CREE project is made up of:

- 159kW battery storage
- 30kW (6 x 5kW) wind turbines
- 30kW ground mounted solar PV array
- Electrical grid and control infrastructure
- Equipment accommodation (sheds for battery storage and control equipment)

The six turbines are served by a small inverter shed which links into the existing electricity distribution network. The wind turbines work alongside a bank of solar PV cells, both feeding electricity to the battery storage system through inverters. The 159kWh battery bank also links to the electricity distribution network and can use the existing diesel generators as a back-up power supply if needed, for example if the system is being maintained or the wind and sun aren't generating enough power. Overall it is expected that over 90% of energy generated on the island will come from renewable sources.

This project also uses smart technology to balance supply and demand, using the battery bank and remotely-triggered auxiliary heat loads. This helps the generators to work as efficiently as possible, reducing the time they need to run for.

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KEY ACHIEVEMENTS

The CREE project took over from the diesel generators in October 2018 and the project was officially opened on 6th April 2019 by Paul Wheelhouse, Minister for Energy, Connectivity and the Islands. The people of Canna now have a reliable, low carbon 24-hour electricity supply, with better power quality and less risk of bills escalating if diesel costs rise. There are currently 18 permanent residents on Canna, and having a reliable power source is vital to help expand the population and the existing housing infrastructure.

The new power system will also benefit existing local businesses and allow for expansion and investment. There are currently around 10 businesses on the island including guest houses, a cafe, campsite and crofts. Reliable and affordable power will help these businesses to thrive and expand.

The CREE project will help increase visitor numbers by providing reliable power and creating the potential for investment in new facilities, like a community hub and bunkhouse with accommodation, electric showers and laundry facilities. loCCDT and NTS are currently doing a feasibility study for these facilities, which wouldn't be able to run without the additional electricity capacity created by the CREE project.

The project also has great environmental benefits. The system is estimated to save over 36,000 litres of diesel per year, equivalent to 96.6 tonnes of carbon dioxide emissions (in direct emissions only, not taking into account the energy involved in extracting, refining and transporting the diesel). Over 25 years of operation, this could save over 2,400 tonnes of carbon dioxide!

This is the third of three off-grid island electricity schemes that CARES has assisted, the other two being on Eigg and Muck. The use of wind and solar PV gives the Canna grid a diverse mix of generation which can supply the island in all seasons.



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LESSONS LEARNED

The community alone didn't have the time or experience to get the project up and running, and it wouldn't have happened without the help of an experienced project manager. After several false starts, a core team emerged from the community with the determination and patience to work with the project manager and keep everything on track.

A representative for the Canna community said, "We're delighted that our energy project is now completed. As well as reducing the noise and pollution from the generators the new scheme will give us the capacity to build additional houses here. We're very grateful to all of our funders for their support in this vital project."



Credit: Steve Wade



Credit: Steve Wade

Website: www.theisleofcanna.com/ioccdt

To find out more about funding from the Community and Renewable Energy Scheme, visit www.localenergy.scot/funding

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