Decarbonising heat and power in Firle Village: A Case Study

BHESCo | Brighton & Hove Energy Services Co-operative Ltd

Introducing BHESCo

About BHESCo

Brighton and Hove Energy Services Co-operative (BHESCo) is a not-for-profit social enterprise accelerating an affordable energy transition by developing efficiency and renewable energy projects.

BHESCo is considered an exemplar within the UK community energy sector, recognised for the depth of our knowledge, the excellence of our project delivery, and the strength of our community relationships.

We have successfully delivered over 60 low-carbon energy projects, which over their operational lifetime will collectively reduce energy costs for our customers by £3.7 million in addition to reducing carbon emissions by an estimated 8,744 tonnes.

The challenge of rural decarbonisation

To achieve its binding target of net zero carbon emissions, the UK Government has a stated ambition to phase out the use of high carbon fossil fuels (such as oil and LPG) for heating.

Rural communities that are not connected to the gas grid will need to find an entirely new way to heat their homes and businesses, which presents a significant financial and technological challenge.

BHESCo offers a solution to such barriers by delivering affordable low-carbon energy solutions at little or no upfront cost.

How BHESCo supports community carbon reduction

BHESCo oversees the planning, development, installation, cost management and operating performance of the systems we install. BHESCo takes a holistic approach to heat decarbonisation, undertaking a detailed, industry compliant survey, using the most modern applications, and working with suppliers to obtain the best performance and value options for each property. We can also act on our customers' behalf in consultations with the local authority regarding permissions for listed properties and conservation areas.

We prepare an energy plan recommending affordable, relevant technologies to deliver a low-carbon and affordable heat and local energy generation solution.

BHESCo stipulates the savings in its contract with customers, ensuring that a high-quality installation is undertaken by one of our experienced and qualified local contractors, removing the risk for communities. Our customers find it comforting to know that BHESCo is available to provide long-term support following the successful completion of a project, as all of our customers become members of our co-op, in accordance with our co-operative rules.

CASE STUDY: Firle Village, East Sussex

Project background

Firle is a rural parish in East Sussex with a population of 327 and 123 domestic properties. BHESCo initiated the project in 2017 by approaching the Estate Manager with a proposal to conduct a feasibility study on how to optimally decarbonise heat for the village. We obtained grant funding from the Rural Community Energy Fund, administered by Greater Southeast Energy Hub, to conduct the project.

At present, most properties in the village rely on fossil fuels as a source of heat, usually heating oil or liquid petroleum gas (LPG).

The goal of the Firle Village Heat Project is to replace existing fossil fuel heating with an affordable,100% renewable alternative.

BHESCo's 'Fabric First' Approach

Most properties in Firle are older, losing a great deal of heat produced by oil heating systems, with poor Energy Performance Certificate (EPC) ratings of E or lower. To produce an affordable, renewable heating solution for residents, BHESCo embarked on a 'fabric first' approach to improve the thermal efficiency of properties so that they could retain heat more effectively, minimising the running costs of a heat pump.

Our Project Management Team conducted a detailed survey of properties to understand the existing energy profile, preparing a retrofit design plan, identifying the most cost-effective solutions to improve thermal efficiency. enhancing comfort levels for residents, while optimising the property's eligibility for government subsidy programmes.

Energy improvement measures would be financed through a community share offer, reducing the burden of high upfront costs for the Estate or its' tenants, while introducing the prospect of community ownership of the systems installed.

BHESCo
Brighton & Hove Energy Services Co-operative

www.bhesco.co.uk
info@bhesco.co.uk
0800 999 671

CASE STUDY TIMELINE: Firle Village, East Sussex

Desktop Survey & Research

BHESCo's Project Management Team and third party consultants conducted research to accumulated datapoints required to determine the suitability of Firle village for a combination of efficient electrical heating systems, including heat networks, heat pumps and resistive heating.

Community / Third Party engagement

BHESCo worked alongside UKPN and the planning authority to identify project challenges and opportunities. Project proposals were presented to village residents over a series of meetings at Firle village hall. Support for the project was determined in addition to recruitment of local champions.

Property surveys & system design

BHESCo's Project Management Team, consisting of domestic energy assessor, retrofit co-ordinator, heating engineer and civil engineer, conducted surveys of village properties, ascertained the heat load requirements and identified suitable energy efficiency improvement measures for each property. A holistic thermal efficiency and heating solution is designed for each property.

Heat Service Agreements signed

Residents sign a heat supply agreement with the heat services supplier (BHESCo), committing to purchase heat for an agreed price over a set period of time. The heat supply agreement is how BHESCo is reimbursed for the upfront costs. A heat supply agreement includes service level agreements and the annual maintenance and repair of the equipment.

Tender process & fundraising

Project installation (heating and energy efficiency systems) is tendered through independent processes to trusted local installers to obtain best value for money on behalf of residents. The capital investment is funded through a community share offer, with residents encouraged to become investors, owning a share in the system.

Installation

Energy efficiency improvements are completed and renewable heating systems are installed in each property along with monitoring systems. Ideally, power is supplied from clean locally owned generation developed independently with the land owner.

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Renewable heating solution

BHESCo's Project Management Team calculated the heat load requirement for each property in accordance with Microgeneration Certification Scheme (MCS) requirements to ensure that the heat pumps would perform well under changing weather conditions. Where a heat pump is not cost beneficial, highly efficient resistive heating systems are considered.

Each home is to be fitted with a suitably sized capacity heat pump to provide hot water and space heating for domestic use. The installations include remote monitoring devices to flag any potential problems while enabling BHESCo to optimise the electricity supply tariff with the individual usage patterns of each resident. This feature provides additional energy services to the customer by applying a time of use electricity tariff. This is an important aspect of migration to a smart electricity grid.

We estimate that the combination of energy efficiency measures plus renewal heating will reduce annual carbon emissions for each property by 67%. BHESCo's holistic approach to property upgrades means that by addressing the immediate concerns and needs of residents, we can reduce the impact of future scenarios on the grid, for example, electric vehicle charging

CASE STUDY: Firle Village, East Sussex

Financing of recommended energy improvements

BHESCo offers to finance the installation cost of the systems installed, helping estates to improve the quality of life of its residents. BHESCo owns, operates and maintains the systems for the duration of the mutually agreed finance period. Upon termination of the finance period, title to the measures installed may either be transferred to the customer, or the energy service period can be extended.

Our social enterprise heat service model, prioritising the provision of clean, affordable heat, offers a trusted service to estates, run by energy experts with values firmly embedded in preserving the wellbeing of residents. All of our terms and relationships are transparent. The customer pays a monthly charge, according to the terms of the heat supply agreement for the heat consumed from our system. This is how we minimise cost and hassle for our customers, making it as easy as possible to transition away from fossil fuels in our energy supply with minimum change to the customer's heating costs.

To fund the energy efficiency improvements and renewable heating systems for the Firle village project, BHESCo will launch a community share offer, paying investors an annual interest rate of 5%. Since 2015, BHESCo has attracted £2 million of community investment in this way enabling the development of over sixty community owned clean energy projects.

Advantages of working with a social enterprise

BHESCo is a consumer co-operative, which means that we remain accountable to our customers long after the project installation. Our customers become members of our co-op, having a say in our governance. This gives customers the confidence to take action on climate change because they are not alone on the journey, they are entering into a long-term relationship with a trusted community partner who walks with them every step of the way.

CASE STUDY: Firle Village, East Sussex

Community engagement

To engage village residents with the project and to demonstrate our commitment to understanding and alleviating their concerns, BHESCo has held a series of seminars at the village hall, video conferences or one to one meetings with residents over three years.

We invited project partners and consultants to share their proposals and to field questions from the audience. Meetings were very well attended, enabling BHESCo to understand the issues that were most important to the community, and to identify local champions who could advocate on our behalf.

In addition to providing BHESCo with a platform to present our proposals to village residents, these events also allowed us to collect data on residents' contacts details, fuel usage, and conerns that impacted their support or opposition to the project.

We understand the importance of community scale buy-in, as in some villages where decarbonisation occurs incrementally, due to grid constaints, the last person to connect their electric heat pump or vehicle may be charged to fund network reinforcement costs. Working with BHESCo means that any issues are made transparent early in the process, so that an optimal solution for all village residents can be agreed.

Planning permissions & electricity grid considerations

BHESCo liaised with South Downs National Park Authority (SDNPA) to gain the relevant planning consent for the technical installation. We met with SDNPA to explain the benefits of working with community energy practitioners, to help them design a roadmap for the type of scheme we are developing in Firle, as planning regulations are not tailored to support the uptake of heat pumps at scale.

BHESCo also spent a significant amount of time liaising with UK Power Networks, the Distribution System Operator for the South East, to understand the implications of 'grid constraint' in the region, regarding connection costs associated with grid reinforcement. Understanding a community's current and future network demands is key to identifying and quantifying the most cost-effective decarbonisation solution.

It is vital to determine the impact of additional demand on the local electricity network to forecast when grid reinforcement costs will be levied. BHESCo's close relationship with UKPN means that we can incorporate these considerations into your long-term decarbonisation strategy.

South Downs National Park Authority

UK Power Networks Delivering your electricity

CLEAN ENERGY FOR PEOPLE, NOT FOR PROFIT

Brighton & Hove Energy Services Co-operative Ltd
Freedom Works | Barts House
Black Lion Street, Brighton, BN1 1JE
www.bhesco.co.uk
info@bhesco.co.uk
Telephone: 0800 999 6671

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