

SIF Discovery Round 2 Close Down Report Document

Date of Submission

Jul 2025

Project Reference Number

10061386

Project Progress

Project Title

SHIELD - Smart Heat and Intelligent Energy in Low-Income Districts

Project Reference Number

10061386

Lead Funding Licensee

UKPN - Eastern Power Networks Plc

Project Start Date

April 2023

Project Duration

3 Months

Nominated Project Contact(s)

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Project Summary

SHIELD addresses Challenge 1: Supporting a just energy transition. Covid-19 pandemic and the 'cost of living crises has exacerbated consumer vulnerability recently, with implications for driving a fair net zero transition. This requires decarbonisation approaches that embed a range of consumer needs at the core of new product and service development. SHIELD replaces existing heating solutions with innovative low carbon heating solutions in conjunction with novel energy generation and storage technologies that will balance demand and supply so that heat becomes affordable and scalable. In addition, SHIELD better identifies and understands vulnerable and low-income households needs to enable better adoption of low carbon technologies for heat and energy generation.

SHIELD requires strong network innovation as it brings multiple parties together to collaborate to embed new technologies, systems, and business models. The deployment of LCTs and onsite generation impacts the network and their assets and often requires work to be completed by the DNOs which can be costly and/or time consuming. SHIELD develops an innovative business model that enables affordable scalability given stakeholder capacity constraints. Existing stakeholder capacity constraints, addressed by this model, that hinder scalability include: i) funds for initial capital costs (ii) time and energy (iii) risk appetite (iv) trust in third party solutions (v) network capacity investment timelines.

This project includes a wide range of project partners to support the successful delivery of discovery phase:

- UK Power Networks: Owns and maintains the electricity network, from substations to cables and overhead lines that are required for the installation of low carbon technologies
- Essex County Council: Have a duty of care and understanding of their residents needs
- Power Circle Projects Limited: They are a social enterprise dedicated to supporting social housing providers, private house owners, communities
- Citizens Advice Essex: Expertise and engagement with vulnerable customers on their needs relating to energy and heat
- Eastlight Community Homes Limited: Experience working with communities to create affordable homes and great neighbourhoods
- UK Community Works: Experience supporting activities that help to build stronger, more cohesive local communities
- Thermify Holdings Limited: Technology Provider for distributed data centres
- Kensa Contracting Ltd: Technology Provider for ground source heat pump systems

Key innovation users are:

- Households and consumers, initial focus on social tenants requiring affordable solutions to decarbonising their homes;
- Registered Social Landlords who need innovative affordable solutions to decarbonising their stock
- Communities that need access to solutions that address the need for affordable decarbonisation of their residents.

Project Description

The current approach to decarbonising heat and energy in consumers' homes is costly and not inclusive of vulnerable and low-income households. New approaches and business models for installing low carbon technologies (LCTs) such as photovoltaic (PV), wind generation, storage, and electric vehicles (EV) charging, in conjunction with low carbon heating solutions can make the decarbonisation of heat and energy affordable and therefore accessible to vulnerable consumers.

This project aims to design, develop, and test new cross-industry and community business models and mechanisms that integrate several innovative LCTs to find a viable pathway for vulnerable customers to affordably decarbonise their heating and energy. This project will test the following approach:

(a) Provisioning Smart Local Energy Management Systems (SLES) in local community areas with aggregation and management support provided at county level enabling smart energy management for the most efficient usage of all innovations and enabling affordable EV charging;(b) Optimising onsite electricity generation sourced from rooftop PV and new rooftop wind energy technology with electric heating by matching the heat demand and load profile to the generation;(c) Using the heat produced from Thermify's Distributed Data Centres, installed in vulnerable customers in residential homes or flats will provide low-cost heating ;(d) Optimising heat provision using a scalable social Energy Services company (ESCo) model & electric storage;(e) Protective measures for vulnerable customers to ensure security of supply e.g., energy alerts, backup power; and(f) Testing new methods for identifying suitable vulnerable customers for the above technologies and appropriate engagement plans

SHIELD will be at the forefront of the energy transition for vulnerable customers. Whilst work has already begun to develop solutions for vulnerable customers to decarbonise their heating and energy, this is often done in silo of other complimentary technologies and the business models used are rarely sustainable or scalable. SHIELD will apply whole system and cross-vector thinking with innovative business models to converge existing technologies with innovative heat and energy generation technologies that balance their generation to design truly customer focused propositions. This is currently too risky for consumers and technology providers as many of the solutions have not been tested at scale. For network companies, this project will be highly valuable as they will better understand the impact that multiple LCT households will have on the network and the possible solutions that will ensure network companies are not barriers to the uptake of LCTs for vulnerable customers.

Summary Key Findings

See End of phase report

User needs

See End of phase report

Impacts and benefits

See End of phase report

Risks, Issues and Constraints

See End of phase report

Working in the open

See End of phase report

Costs and value for money

See End of phase report

Special conditions

See End of phase report

Documents uploaded where applicable

Yes

Documents:

SIF Round 2 Discovery - SHIELD End of Phase (for upload) (1).pdf