SIF Alpha Round 2 Project Registration

Date of Submission

Project Reference Number

10061387

Initial Project Details

Project Title

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

Project Contact

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Challenge Area

Supporting a just energy transition

Strategy Theme

Net zero and the energy system transition

Lead Sector

Electricity Distribution

Project Start Date

01/10/2023

Project Duration (Months)

6

Lead Funding Licensee

UKPN - Eastern Power Networks Plc

Funding Mechanism

SIF Alpha - Round 2

Collaborating Networks

Electricity North West

UK Power Networks

Technology Areas

Heat Pumps

Distributed Generation

Poverty

Energy Storage

Project Summary

SHIELD is a bold new initiative that will revolutionise the way we heat our homes. By using innovative low-cost low-carbon heating solutions, such as distributed data centres, SHIELD will help to decarbonise heat and energy for vulnerable consumers and social housing tenants.

In addition, SHIELD will use smart energy generation and storage technologies to intelligently balance demand and supply, helping reduce the upfront cost and running costs of consumers' heating and energy.

This innovative approach to decarbonisation has the potential to transform the energy landscape and make a real difference to the lives of vulnerable people.

Add Preceding Project(s)

10061386 - SHIELD - Smart Heat and Intelligent Energy in Low-Income Districts

Project Budget

£556,276.00

SIF Funding

£475,123.00

Project Approaches and Desired Outcomes

Problem statement

The current approach to decarbonising heat and energy in consumers' homes is not inclusive of vulnerable and low-income households. This is because the upfront and running costs of these solutions are too high for many of these households to afford.

In spring 2022, Essex County Council's Chief Executive's Office conducted research on fuel poverty in the County. The results showed that at least 7.6% of households across the County were in fuel poverty. This figure could rise to 17% in a worse-case scenario. Nationally, the National Energy Action estimates that there are 7.5 million UK households currently experiencing fuel poverty.

SHIELD addresses Challenge 1: 'Supporting a just energy transition' by providing a low carbon solution that significantly reduces energy and heating costs for households. We can also offer this at no upfront cost via an energy services model. This makes it a more inclusive solution that can be accessed by all households, regardless of their income.

SHIELD sees residential consumers as the main users of the solution. We surveyed nearly 500 Eastlight Community Homes' (Eastlight) tenants during Discovery Phase to better understand their attitudes and needs. We found:

A significant majority:

· Were concerned about energy costs -- average score 9.1/10

· Were interested in learning more about low carbon technologies (LCTs) -- average score 8/10

· 68.3% of tenants would be willing to try out the SHIELD approach

· The tenant engagement validated the need for SHIELD and gave the project team confidence that the solution would be acceptable to the target market. However, concerns were raised about operation of new technology, maintenance and digital interfaces. More work is needed to provide all the information consumers need to adopt SHIELD.

In the Alpha Phase, the project team is addressing these concerns by partnering with Citizens Advice Essex, a trusted organisation that provides independent advice to tenants. They will work with tenants to help them understand the SHIELD approach and encourage them to sign up for the Beta Phase trials. They will also provide additional support on topics such as fuel poverty, energy efficiency, low carbon technologies, and digital access.

Evolution of SHIELD through Discovery Phase:

· A deeper understanding of the challenges and opportunities for the technologies it will deploy and how they can be integrated

· How Thermify HeatHub can replace existing heating systems with a distributed IT data centre module that uses waste heat from its operation to provide heating/hot water. In residential homes, SHIELD will integrate solar PV, battery and heat storage with the HeatHub and smart energy management to help balance demand and supply and provide services to the grid.

· How ground source heat pump integration with the HeatHub adds value in scenarios such as blocks of flats with limited space availability.

· SHIELD considered integrating rooftop wind technologies, but due to their lower current technology maturity, SHIELD will revisit the use of this technology in Beta Phase.

· Developed a site shortlisting and assessment process based on space requirements and other factors

· The penetration of EVs is low within the target consumers so will not be planned for trial. However, the solution can cater for EVs, and in the future, V2X will build a stronger benefits case for the SHIELD solution

The project has shortlisted 3,000 out of 11,000 Eastlight's homes in the towns of Witham, Colchester, Braintree, and Halstead for Beta Phase. Not all properties are suitable due to their existing heating system, their EPC rating and network considerations.

Innovation justification

SHIELD will deploy Thermify's HeatHub, a new innovative technology that provides safe and secure distributed data centres in homes. They generate heat as a by-product of data processing, which can be recovered to warm the home. The HeatHub intelligently adjusts its data processing activities based on the home's heat requirements, reducing workload in summer to avoid overheating. Additionally, we will incorporate advanced energy generation and storage technologies to help balance demand and supply, making heat and energy more affordable at scale.

SHIELD applies whole system thinking to converge Thermify's HeatHub with other LCTs in smart local energy systems (SLES) that help:

· Balance generation and load within the home

· Balance the wider electricity network

· Provide flexibility and other services to the grid

SHIELD ensures that low carbon heat is made affordable, inclusive and scalable. It incorporates innovative business models and mechanisms, with robust cross-industry collaboration. These solutions will then be made accessible at scale to social landlords and housing associations with stretched human and financial resources. By targeting social housing tenants and vulnerable customers, SHIELD meets Challenge 1, ensuring they receive the benefits of the energy transition.

SHIELD will aim to apply learnings from related projects. SHIELD has had discussions during Discovery Phase with two ENWL SIF Discovery Phase projects, Net Zero Terrace and RetroMeter. For Net Zero Terrace, ENWL are looking to find ways to decarbonise terraced streets using a ground source heat pump system. SHIELD has learnt that there could be an opportunity for Thermify to complement the ground source heat pump system in the future. For RetroMeter, this project could help SHIELD monetise its carbon savings in the future. Through this engagement, ENWL will be joining SHIELD to explore these opportunities in more detail.

This approach is currently un-tested for social landlords, funders, and consumers at scale. Data services are the primary source of revenue for Thermify however additionally, their business model sells heat as a service to households. SHIELD will demonstrate the efficiency of deploying Thermify's solution in individual homes and the integration of Thermify with heat pump systems in blocks of flats. Thermify products are at TRL 7 and CRL 7 at present, but we expect it to reach TRL 8 by Alpha Phase and TRL 9 and CRL 8 by Beta Phase.

The proposed scale for Beta Phase (c.300 homes) is appropriate as it will qualify the SHIELD solution for both DSO and ESO grid services requiring 1MW+ of flexible assets.

SHIELD cannot be funded elsewhere within the price control or considered as part of business-as-usual activities due to the complexity and risk in approach, integration of technologies and new business models. The phased approach to SIF provides the right funding and ecosystem for the project to develop in an agile way.

The counterfactual and alternatives to decarbonise residential heating are ground or air source heat pumps or heat networks. In isolation, these technologies have high upfront costs, add to householder bills and for networks they add to network pressures and are costly due to the upgrades required. The SHIELD solution is cheaper for consumers as it uses waste heat from data processing and puts less pressure on the network as SHIELD delivers a SLES through integration of renewable generation and storage.

The demand for data processing is growing. In 2020, the global cloud computing market was valued at $371.4 billion, and it is estimated that by 2025 it will rise to a staggering $832.1 billion. If scaled, distributed data centres can support this growth and reduce the challenges networks face connecting large single points of demand for centralised data centres.

Impact and benefits (not scored)

Financial - future reductions in the cost of operating the network

Financial - cost savings per annum on energy bills for consumers

Environmental - carbon reduction – indirect CO2 savings per annum

Revenues - improved access to revenues for users of network services

New to market – products

New to market - services

Impacts and benefits description

SHIELD has a NPV of £3.41m up to 2030 at the project trial scale.

This figure is based on a forecast of c.300 of Eastlight households taking up SHIELD solutions - Thermify HeatHub, solar PV, heat storage, battery storage and smart energy management). This calculation is conservative and will be developed in more detail during Alpha Phase.

Baseline: If SHIELD is not deployed, assumption that by 2027, half of the households switch to air source heat pumps (ASHP) and half will remain with gas boilers due to high upfront costs of ASHPs.

Key Metrics: Number of households that have taken up the solution, energy and heating usage/output and energy prices to estimate benefits.

Financial - future reductions in the cost of operating the network

Baseline:

Increased capacity on the electricity network over RIIO-ED2, resulting in four LV substations requiring upgrades at the project-level scale in shortlisted areas

Switching from gas boilers to electric heating, general enquiry work is required, e.g. fuse upgrades.

Solution:

Deferral of network reinforcement of four LV substations due SHIELD solution optimising energy usage and providing flexibility services

Metrics:

Number of LV substations that require upgrades avoided (number, MW and £)

Financial - cost savings per annum on energy bills for consumers

Baseline:

Heating costs can be estimated using the following assumptions:

Cost of heat pump households is based on average number of kWh for heating of 12,000kWh per year. Therefore, the electricity requirement is 4,000 kWh with a COP of 3. Electricity price of 30.11p per kWh and cost of heat pump and install is £10,000.

Cost of gas boiler households is based on 12,000kWh for heating annually, therefore gas usage of 13,042kWh with a COP of 0.92. Gas price of 7.51p per kWh.

Solution:

Energy cost is £300/year based on Thermify's current proposition and the annual fee for heat-as-a-service they provide to consumers. This is considerably cheaper than the baseline.

No upfront costs to customers for the solar PV, heat storage or battery storage as this will be owned by the social ESCo and

incentives/revenues from the assets are returned to the asset owners. Similarly, P2P scheme will lower the unit rate of electricity.

Metrics:

Energy bill savings (£)

Environmental - carbon reduction -- indirect CO2 savings per annum

Baseline:

GHG Emissions for heat pumps is based on energy usage assumption above, electricity carbon emissions factor and number of heat pumps.

GHG Emissions of gas boiler is based on energy usage assumption above, gas carbon emissions factor and number of gas boilers.

Solution:

GHG emissions benefits from consumers using SHIELD solution. SHIELD assumes there are no GHG emissions associated with heating for the SHIELD solution as heat is a waste output from the data centre processing. Therefore, the benefit of the solution is equivalent to the size of the baseline emissions.

Consuming local renewable generation that wasn't installed in baseline (to be quantified in Alpha Phase)

Metrics:

Carbon reduction (kgCO2)

Revenues - improved access to revenues for users of network services

Baseline:

No previous revenues for users

Solution:

Access to ESO balancing mechanism, demand flexibility services, firm frequency response and DSO flexibility services revenues for the owners of the flexibility assets. The amount of electricity exported will be reported and revenues received will be tracked through the social ESCo

New to market -- products/services

A new innovative distributed data centre heating solution and heat as a service proposition for consumers along with the SLES and assets installed by social ESCo. Metrics are covered by the other benefit types.

Teams and resources

For Discovery Phase the Project Partners were UK Power Networks (UKPN), Essex County Council, UK Community Works, Eastlight Community Homes, Thermify, Power Circle Projects, Kensa Heat Pumps (Kensa) and Citizens Advice Essex. With such diverse expertise, minimal changes are being made for Alpha Phase.

For Alpha Phase, we are adding UrbanChain and Electricity North West Project Partners and Kensa will move to a subcontractor for Thermify.

Subcontractors for Alpha Phase include Simcott and Anderson Strathern who will subcontract to Power Circle Projects, Bird & Bird subcontracted to UrbanChain and Citizens Advice Consortium subcontracted to Citizens Advice Essex.

Roles, skills, and experience of project partners

· UKPN is the Project Lead. UKPN owns and maintains the electricity network, including substations, cables and overhead lines required for the installation of LCTs. They also procure flexibility services to reduce network reinforcement.

· Essex County Council will be leading the project management work package. The proposed trials are located within their region and they can bring together a wide range of parties.

· Eastlight will be leading the commercial agreements and funding structure work package. They are the housing association whose tenants will be participating in the trials.

· Thermify will be leading the pilot deployment work package. Thermify are the key technology provider for the SHIELD proposition with their innovative distributed data centre heating product.

· Power Circle Projects will be leading the site, technology, and modelling work package. They are a social enterprise dedicated to supporting social housing providers, private homeowners, communities and have delivered many community-led low carbon projects.

· UrbanChain will be delivering the Energy Supply and Peer to Peer Trading work package. UrbanChain are the leading provider of Peer-to-Peer energy exchange services in the UK and pioneer of innovative supply arrangements. For SHIELD to develop its route to market, business model and customer proposition in more detail, it needs to interact and operate between consumers, prosumers and generators. UrbanChain will help SHIELD design this.

· Electricity North West will be delivering the Learnings and Scalability work package. They lead projects which are complementary to SHIELD and will be able to provide perspective for how SHIELD can be scaled to their licence area. This ensures SHIELD is designed for wider rollout across GB.

· UK Community Works will draft the tenant engagement plan and materials. UK Community Works have extensive experience supporting engagement activities.

· Citizens Advice Essex will be leading the tenant engagement. Citizens Advice Essex have the expertise and engagement experience with vulnerable customers on their needs relating to energy and heat.

Roles, skills, and experience of subcontractors

· Kensa will be supporting the testing of the Thermify-Kensa integration. They are a leading technology provider for ground source heat pump systems.

· Simcott will be supporting the home surveys and supply and install to pilot homes. They are an experienced Essex-based installer used to residential installations of relevant technologies.

· Anderson Strathern will be supporting the contract suite and regulatory review. They are lawyers with extensive energy project experience who have worked with Power Circle Projects on comparable contract suites and regulatory reviews.

· Bird & Bird -- UrbanChain's legal firm and have experience drafting agreements for peer-to-peer energy supply.

· Citizens Advice Consortium -- Citizens Advice Essex will leverage the consortium to use advisors that are able to undertake home visits, phone calls and engagement.

Additional resources:

· Simcott and Thermify will source all equipment for pilot installations.

· Kensa will provide use of their existing test facility for testing the Thermify-Kensa integration

Additional parties:

· Engagement with potential tenant participants for Alpha and Beta Phases is planned.

Project Plans and Milestones

Project management and delivery

Essex County Council will be accountable for project management in SHIELD with UKPN supporting. The approach will be weekly progress meetings where the risk register, action tracker, Gantt chart and project plan held in SharePoint are reviewed and updated. We will complement the Council's approach using our own proven innovation governance processes.

In Alpha Phase, SHIELD will conduct engagement to identify tenants willing to participate in Beta Phase, develop the commercial agreements and energy supply options for Beta and deploy a pilot in two homes to test SHIELD. These activities will de-risk Beta Phase and set the project up for success to scale.

WP1 - Project Management (Essex County Council)

Key Milestones: Agree roles and responsibilities of Project Partners and managing end-to-end delivery.

Key Dependencies: WP9 and support from UKPN

WP2 - Tenant Engagement Plan (UK Community Works)

Key Milestones: Tenant engagement materials drafted, and plan developed

Key Dependencies: D5.1 - Beta legal agreement and tenant consent plan

WP3 - Tenant Engagement Conducted (Citizens Advice Essex)

Key Milestones: Confirmation of tenants willing to participate in Beta Phase

Key Dependencies: D2.1 - Production of tenant engagement plan and draft versions of all engagement and communications materials and

WP4 - Technology and Modelling (Power Circle Projects)

Key Milestones: Site surveys undertaken of a sample set of potential Beta participating homes, Connection, network & flexibility impact assessment complete, Beta technology readiness activities completed and CBA completed.

Key Dependencies: D3.4 - Records of tenants who have provisionally agreed to participate in Beta Phase, D5.4 -- Beta route to market and commercialisation report, D6.4 - Post Thermify/SLES pilot energy performance report and D6.8 - Post Thermify/Kensa pilot integration performance report

WP5 - Beta Commercial Agreements & Funding Structure (Eastlight Community Homes)

Key Milestones: Beta tenant agreement completed and Beta route to market and commercialisation activities completed

Key Dependencies: D7.1 - Electricity supply and generation contract options report.

WP6 - Deploy Pilots (Thermify)

WP6 has a key milestone which acts as a Gate stage: M6.2 - Thermify/SLES Pilot approvals obtained from Eastlight Community Homes and tenants. This milestone needs to be completed to unlock the significant spending on equipment and materials for the installation of the Alpha pilots.

Other Key Milestones: Completion of Thermify/SLES pilot in tenants homes and Completion of Thermify Kensa integration pilot at test facility.

Key Dependencies: D6.2 - Thermify/SLES Pilot go-live tracker

WP7 -- Energy Supply and Peer to Peer Trading (UrbanChain)

M6.2 is a key milestone that acts as a gate stage for D7.4, D7.5 and D7.6. If the Alpha pilots are not installed, tenants will not be onboarded for energy supply and peer to peer trading.

Key Milestones: Electricity supply and peer to peer contract options developed and Alpha Phase p2p pilot delivery.

Key Dependencies: D6.2 - Thermify/SLES Pilot go-live tracker

WP8 -- Learnings & Scalability (Electricity North West)

Key Milestones: List of learnings and scalability considerations documented and shared with the project partners, UKPN dissemination event

WP9 -- Alpha Phase Governance (UK Power Networks)

Key Milestones: Contracts signed by partners, SIF governance milestones, knowledge dissemination, support WP1

Key risks for Alpha include issues with the technology integration found during testing, change in modelling assumptions, failure to recruit a large enough number of participants for Beta Phase and delay in SAP Appendix Q outcome to register Thermify HeatHub as a sustainable home technology. Full risks and mitigation are in the risk register.

SHIELD does not anticipate any supply interruptions for consumers or any changes to access to energy services. If a pilot consumer requests us to replace their SHIELD solution during Alpha Phase, the project will do this.

Key outputs and dissemination

By the end of Alpha Phase, SHIELD aims to have validated, qualified, and tested the SHIELD proposition. The purpose is to have completed enough readiness activities to give confidence in the progression to Beta Phase and the scaling and implementing of the solution.

All outputs and partners responsible can be found detailed in the Project Management Book and Gantt chart. SHIELD will maintain and updated a lessons learnt tracker throughout Alpha Phase to ensure we identify and capture them all.

Key Outputs for Dissemination (by end of Alpha Phase):

WP3 -- Tenant Engagement

Outputs: SHIELD will have qualified and recorded a list of tenants willing to participate in the Beta Phase. SHIELD will

disseminate the number of tenants that have agreed to participate in Beta Phase and the learnings and outcomes from engagement.

WP4 -- Sites, Technology and Modelling

Outputs: SHIELD will have site survey reports for a sample set of potential Beta Phase participating homes, produced a report with finalised Beta Phase site selection, technology specifications and roll out plan, produced a connection, network and flexibility impact report and CBA. SHIELD will be able to disseminate these outputs but will make generic where necessary to ensure personal data is not shared publicly.

WP5 -- Beta Commercial Agreements & Funding Structure

Outputs: Supplemental tenant agreement will be produced, route to market and commercialisation report and regulatory impact assessment report. SHIELD will be able to disseminate these outputs and will redact where necessary to ensure commercially sensitive information is not shared publicly.

WP6 -- Deploy Pilots

Outputs: SHIELD will have deployed the pilots in up to two homes and produced a pilot install completion report, energy performance report and post pilot tenant engagement report. SHIELD will be able to disseminate these outputs and will make anonymise where necessary to ensure personal data is not shared publicly.

WP7 -- Energy Supply and Peer to Peer Trading

Outputs: An electricity supply and peer-to-peer contract options report will be produced and disseminated.

WP8 -- Learnings & Scalability

Outputs: Innovation Learnings report and scaling report available for dissemination.

UKPN will coordinate and lead dissemination activities which include:

· Significant engagement with the users of SHIELD (social housing tenants) throughout Alpha Phase.

· Sharing the learnings and findings from SHIELD with other DNOs via a virtual learning session

· Through UKPN and Essex County Council's network, SHIELD will host an online event to share the learning and findings of SHIELD. Also share dissemination materials via local government networks and platforms such as the Energy Systems Catapult's Net Zero Go.

· SHIELD and Power Circle Projects will share the learnings and findings with other social landlords that they are in contact with via a virtual sharing session

· Thermify will share the SHIELD outcomes via its set of contacts

· SHIELD will publish a public summary report the key outputs, deliverables, and learnings of Alpha Phase on UKPN's website. More detailed information or specific deliverables will be reviewed and provided upon request.

All our Alpha Phase projects will be uploaded to the Smarter Networks Portal and feature on the UKPN's website with specific project learnings being disseminated at the IUK Show & Tell events. In addition, UKPN will host an in-person event in London to disseminate the learnings and key outputs of all SIF projects to a wider audience.

UKPN will look to share project successes and discoveries via its social media channels with the possibility of publishing to external media where appropriate.

Commercials

Intellectual property rights, procurement and contracting (not scored)

The parties agree to adopt the default IPR arrangements for this project as set out in Section 9 of the SIF Governance Framework.

The partners recognise that knowledge transfer is one of the key aims of the SIF, and that the benefits of this project will be maximised by the ability of other licensees to be able to learn from the Project so as to create improved outcomes or reduce costs for consumers. The partners anticipate that the Alpha Phase (or any potential subsequent phases) will result in the creation of IPR that can be freely disseminated, and have no expectation of creating income streams or royalties from IPR outside of participation in a competitive marketplace for services that may be informed or stimulated via the outcomes of the project.

Subcontractors identified in 'Team and Resources' will be direct sourced.

Commercialisation, route to market and business as usual

The commercialisation of the SHIELD solution will be led by Power Circle Projects who have experience deploying SLES and other community-led projects. Power Circle Projects is in dialogue with prospective funding partners such as social impact investors about SHIELD's potential role in other projects. SHIELD and Power Circle Projects will approach local authorities and housing associations with the SHIELD solution, its business case, and an accessible ESCo-based finance solution. The investors would form an ESCo and own the flexibility assets and receive grid services revenues from these. Power Circle Projects would agree a commercial management contract with the ESCo to install and operate the SHIELD solution on behalf of the company.

The customer value proposition and business case for financing is:

· Customers can access low-cost heating as this is a waste output of the distributed data centre that is hosted on the customers property. Distributed data centre providers can provide this at a low cost as their primary source of revenue is from data processing services not heating.

· Customers do not pay for the storage and generation technologies as these will be owned by the investors/ESCo and due to the scale of the SHIELD solution, the revenues and incentives from export and services to the grid are returned to them.

· For social and private landlords, more affordable heating results in less damp, improved tenant health and better maintained housing. It will also contribute to meeting energy efficiency and climate-related regulatory requirements without constrained capital programmes.

· For data centre users, the flexible provision of data services with low emissions and high positive social impact to contribute to meeting customer CSR objectives.

· For network and system operators, the higher number of integrated and flexible LCTs will reduce the peak demand and hence the need for network reinforcement while improving resilience.

In Beta Phase, SHIELD will be targeting c.300 homes in Essex which will be of sufficient scale to enable an effective transition into business as usual (BAU). The project will work with all the relevant stakeholders throughout the project lifecycle, through design and testing to ensure solutions are based on real situations and achieve BAU adoption at the quickest opportunity. All project partners will be responsible for the implementation of SHIELD and will be commercially ready to scale for Beta Phase.

SHIELD will pave the way for developing a replicable framework for quickly deploying solutions like SHIELD in different network licence areas. The framework will enable the connection and installation of these technologies to be formalised, accelerated, and included in UKPN's (and other networks') processes and standards so that licensees can apply SHIELD's learnings. This includes approving the Thermify HeatHub as a LCT equivalent to a heat pump, assessing the impacts of the SHIELD solution as a whole system rather than individual technologies, providing guidance to housing associations and others on how to select the most appropriate households for a SHIELD solution and how to access flexibility services.

SHIELD seeks to advance and does not undermine the development of competitive markets as the offerings developed through

SHIELD create additional offerings in the market and will be available to all eligible market participants.

Once proven effective, new services and/or incentives for customers would be funded through BAU allowances or project finance from funding partners of the stakeholders implementing the solutions.

Policy, standards and regulations (not scored)

A regulatory review conducted before Discovery Phase by Power Circle Projects demonstrated that the model proposed for provision of energy services to households is consistent with regulatory requirements and does not require a derogation. An update to the review will be carried out during Alpha Phase in Work Package 5 but no change is anticipated.

However, several regulatory barriers may hinder delivery to some degree either at Beta Phase or in BAU. These include:

· For balancing mechanism revenues to be generated, the householder would need to agree to their electricity supply contract being with a licensed supplier which supports residential half hourly settlement. Residential half hourly settlement is only supported by some suppliers at present. We understand that Ofgem plans to require all suppliers to support residential half hourly settlement by 2026/27.

· For blocks of flats, if more than 50 kWh of solar PV is to be installed it would require planning consent in Scotland (this may hinder faster deployment in BAU).

· Ofgem Code change P379 would enable more than one customer to draw a supply through the same boundary meter, however this is currently paused. SHIELD plans to engage with Ofgem on this during Alpha Phase via UKRI to understand the situation. Thermify will pay its energy supplier directly for the electricity which its HeatHub consumes in the home so the code change is of interest. Currently it requires a separate boundary meter to be installed which increases cost and complexity of such installations. However, installing a secondary boundary meter is the current assumption for Alpha Phase Pilots.

· Consideration will also need to be given for future longer-term implementation of distributed data centres. In the future, policy may change and restrict the scope of data that could be held in distributed data centres located within customers' homes due to the cyber security risks.

The project will not require a derogation or exemption from any project-related regulatory requirements.

Value for money

What are the Alpha Phase Project costs and how are they proportionate to the Project delivery?

SHIELD total costs: £556,276

SHIELD total contribution: £81,153 (14.59%)

SHIELD total SIF funding requested: £475,123

UK Power Networks

Total Costs: £92,725

Total Contribution: £9,572 (10%) contribution in-kind via labour

Total SIF Funding Request: £86,153

Essex County Council

Total Costs: £11,635

Total Contribution: £1,164 (10%) contribution in-kind via labour

Total SIF Funding Request: £10,471

Citizens Advice Essex

Total Costs: £78,184 (including subcontracting to Citizens Advice Consortium)

Total Contribution: £30,000 (38.37%) contribution in-kind additional affordability support

Total SIF Funding Request: £48,184

Power Circle Projects

Total Costs: £195,394 (including subcontracting to Simcott and Anderson Strathern)

Total Contribution: £19,680 (10.07%) contribution in-kind via labour

Total SIF Funding Request: £175,714

The contribution from Project Partners is above 10%, demonstrating strong commitment to the project from partners as well as value for money to customers.

Thermify

Total Costs: £88,234

Total Contribution: £8,823 (10%) contribution in-kind via labour

Total SIF Funding Request: £79,411

UK Community Works

Total Costs: £32,633

Total Contribution: £3,425 (10%) contribution in-kind via labour

Total SIF Funding Request: £29,208

UrbanChain

Total Costs: £30,639 (including subcontracting to Bird & Bird)

Total Contribution: £4,616 (10%) contribution in-kind via labour

Total SIF Funding Request: £26,023

Eastlight Community Homes

Total Costs: £22,176

Total Contribution: £2,218 (10%) contribution in kind via labour

Total SIF Funding Request: £19,958

Electricity North West

Total Costs: £1,656

Total Contribution: £1,655 (99%) contribution in-kind via labour

Total SIF Funding Request: £1

SHIELD Alpha Phase represents value for money as SHIELD will be piloting the technology during this phase and will produce significant learnings from realising benefits from a real-world demonstration of the innovation. Alpha Phase will de-risk the larger planned trial in Beta Phase by applying lessons learned from Alpha Phase. Our engagement with customers will help influence future innovation projects and policy with respect to the decarbonisation of heat and energy in vulnerable and low-income households.

The financial benefits for SHIELD at project scale will deliver £3.41m up to 2030 representing a strong return on investment without considering licensee or national level. The project will drive down costs for networks while supporting vulnerable customers with their energy bills. We also estimate 40% reduction in annual home energy costs for consumers against what they would pay in the future and a bigger cut for those in fuel poverty.

Discovery Phase highlighted that customers were interested to learn more about SHIELD and LCTs more widely and Alpha Phase continues strong engagement with Eastlight tenants. Citizens Advice in-kind contribution to provide additional affordability advice and support to vulnerable customers that we will engage with, providing value for money. The wider societal benefit of this is that these tenants are likely to share the knowledge gained and empower their communities.

The diverse project team has the skills, expertise, prior knowledge and stakeholder relationships to ensure that the project can be deliver on outcomes efficiently. This strong performance was shown during the Discovery Phase.

Power Circle Projects have delivered many community-led low carbon projects so will be able to leverage their experience for SHIELD. This includes: development of a social ESCo model under the Climate Positive Innovate UK project; study for Historic Environment Scotland on residential heating options; and participation in DESNZ Heat Pump Ready programme.

Kensa, one our subcontractors will also provide use of their existing test facility for testing the Thermify-Kensa integration, reducing overall costs for the project and hence providing value for money.

Associated Innovation Projects

- ○ Yes (Please remember to upload all required documentation)
- ◉ No

Supporting documents

File Upload

SIF Round 2 Alpha - SHIELD - Show and Tell 2024-04-25 - final.pdf - 517.0 KB
SIF Round 2 Alpha - SHIELD - End of Phase Meeting 2024-03-28.pdf - 2.2 MB
SHIELD - SIF Round 2 Alpha - Mid-Point Meeting 2024-01-29.pdf - 1.2 MB
SIF Alpha Round 2 Project Registration 2024-01-23 1_24 - 83.6 KB

Documents uploaded where applicable?

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