

SIF Discovery Round 2 Project Registration

Date of Submission

Jul 2023

Project Reference Number

10058729

Project Registration

Project Title

Local Energy Oxfordshire – Neighbourhoods (LEO-N)

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10058729

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

Apr 2023

Project Duration

3 Months

Nominated Project Contact(s)

Dot Revill

Project Budget

£157,506.00

Funding Mechanism

SIF Discovery - Round 2

SIF Funding

£141,756.00

Strategy Theme

Net zero and the energy system transition

Challenge Area

Accelerating decarbonisation of major energy demands.

Lead Sector

Electricity Distribution

Other Related Sectors

Funding Licensees

SSEN-D - Scottish and Southern Electricity Networks Distribution

Lead Funding Licensee

SSEN - Southern Electric Power Distribution Plc

Collaborating Networks

Scottish and Southern Electricity Networks Distribution

Technology Areas

Commercial, Community Schemes, Demand Response, Digital Network, Low Carbon Generation, LV & 11kV Networks, Network Monitoring

Equality, Diversity And Inclusion Survey

Yes

Project Summary

Project LEO-N addresses the: Accelerating decarbonisation of major energy demands challenge by developing an innovative approach to create an enabling environment for homes, businesses and communities to transition to net zero, at the pace and scale to deliver the Oxfordshire's targets. LEO-N will develop Smart and Fair Neighbourhoods from Project LEO which demonstrated flexibility services sitting at the heart of a smarter, locally-balanced energy system. The proposal is framed around:

FutureFit – helping consumers decarbonise

The Low Carbon Hub's existing retrofit services, Cosy Homes Oxfordshire and Energy Solutions Oxfordshire, will be developed into FutureFit products, to identify a route for each home and business to be transformed into its own flexible energy system. Futurefit will see a new approach to identifying, installing, and funding a coordinated set of building fabric and smart technology options. Without this support, measures may be installed piecemeal, without proper integration reducing overall effectiveness.

Helping Communities Transition

Futurefit will be expanded to community level and beyond with local coordination enabling trading of flexibility and energy services in a Smart Community Energy System (SCES). LEON will identify options to allow this to be implemented across multiple communities to achieve a county-wide impact.

Impact on the future electricity network:

Building on SSEN's work in Project LEO, we will evaluate the network impact of large scale implementation of FutureFit. A key innovation will be how behind the meter measures proposed can be optimised to maximise the use of the existing network and better inform future DNO investment.

New Institutional options for delivery and how nested local area energy planning can support the transition

We will build on the trial Local Area Energy Plan (LAEP) for Eynsham that showed how digital tools developed in Project LEO could be extended to do place-based, whole system energy planning from the street level up to the county level. An institutional architecture is necessary to manage actionable delivery strategies at speed and scale. We hypothesise 'Local Convenor' and "System Coordinator" roles to provide this.

Our partnership brings together a wealth of expertise:

- Southern Electric Power Distribution – DNO
- University of Oxford – energy system expertise
- Low Carbon Hub – local energy business; product innovation; community partnerships.
- Oxfordshire and Oxford City Councils – integration of LAEP, and retrofit expertise
- Baringa Partners –market expertise

The potential users include councils, networks, and community energy businesses. Discovery is intended to deepen our understanding of user needs to enable delivery at scale.

Project Description

We know that a zero carbon energy system is possible if we can increase renewable generation, electrify our heating and transport and improve the energy performance of our building stock. But we need to increase the pace and scale of the transformation to meet the country's climate change objectives.

Building on the highly successful Project LEO, this project Local Energy Oxfordshire – scaling the Neighbourhood - LEO-N takes a systems innovation route to accelerating the pace of the transition by implementing an integrated approach;

- to help consumers decarbonise their homes and businesses, we will create a new approach _ Futurefit with will take a system level approach to the process of decarbonisation, helping identify the right measures for implementation, in the right order, at the right time to ensure that they work together to produce the best long term outcome. The project will look at options for new funding and financing options to support the transition.
- We will develop new tools to allow neighbourhoods and communities to trade and share energy,

- whilst, engaging closely with the electricity network to make best use of the capacity available and optimise future investment needs.

To deliver the change required, new institutional arrangements are proposed to facilitate and drive local delivery, develop new delivery mechanisms including innovative financing options, mobilise the supply chain and improve community level energy planning to integrate with wider City or County wide plans.

Building on the Smart and Fair Neighbourhood trial delivered in Project LEO, this new project will see community energy businesses, network operators and local authorities come together to create the enabling environment required to give everyone involved the confidence to make the changes required and take the opportunities necessary to achieve a just, fair and efficient transition to net zero.

If successful, this brings benefits to consumers, network customers and our planet:

- Lower energy bills – and healthier, warmer homes;
- Lower network costs - and fewer disruptive upgrades;

and a faster transition to the zero-carbon energy system we all need.

Preceding Projects

SSEEN0 - TRANSITION

Third Party Collaborators

Low Carbon Hub

University of Oxford

Oxford City Council

Oxfordshire County Council

baringa

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Project Description And Benefits

Applicants Location (not scored)

SSEN - Southern Electric Power Distribution Plc

No. 1 Forbury Place, 43 Forbury Road, Reading, RG1 3JH

Project Short Description (not scored)

LEO-N is looking at how careful coordination of a new approach to decarbonising homes and businesses combined with coordinated local energy planning can accelerate net zero.

Video description

<https://vimeo.com/773375068/7f2c2dc0e6>

Innovation justification

To achieve net zero at the pace required needs transition at scale, with the integration of new low carbon technologies (LCTs) and improvements in the energy performance of buildings. Current progress is too slow and a fresh approach is needed. Earlier work in Project LEO has shown that flexibility services can contribute to a local zero carbon energy system and that high quality local area energy planning is crucial. Whilst there is a proven list of retrofit options available for consumers along with new LCT options, there is little support to help identify the best options, how to trade at community level and there is no supporting organisational infrastructure to drive delivery. Without this, progress is slow and uncoordinated, potentially resulting in inefficient use of the network.

Solving the problem:

- Households and small businesses are helped to become FutureFit: with support on best route for that premise including new financing mechanisms to allow them to transition to net-zero.
- Local coordination and trading lowers peak demand reducing constraints on the wider network.
- DNOs need new integrated building and network modelling to assess the impact of Futurefit measures on the LV network improving operational efficiency and reducing overall system costs.
- Enabling existing capacity to be used more effectively, potentially, avoiding the need for expensive reinforcement
- New arrangements to allow local actors to work together with DNOs to deliver whole system solution at scale

Project LEO-N takes a 'systems innovation' approach to this challenging problem:

- Developing new FutureFit products that are suitable for a diverse set of customers;
- Enabling local energy trading and flexibility services to manage demand;
- Creating new integrated building and network models to give a more complete understanding for DNOs, planners and communities;
- Using customer data and retrofit options along with recently developed spatial tools to identify new options to scale from street level solutions to county-wide strategies;
- Developing new institutional arrangements to support coordination and drive local delivery

The approach is risky because it takes a 'systems innovation' approach at the LV level where there are few available products, whole system planning tools or the local institutions to aid delivery. Developing Futurefit into commercially viable products and services including technology and building options with appropriate financing options will drive adoption, derisking the transition for consumers. This combined with new local institutional arrangements will drive delivery at scale and allow DNOs to better plan and manage the network

Benefits Part 1

Environmental - carbon reduction – direct CO2 savings per annum against a business-as-usual counterfactual
Environmental - carbon reduction – indirect CO2 savings per annum against a business-as-usual counterfactual
Financial - cost savings per annum for users of network services
Financial - cost savings per annum on energy bills for consumers
Financial - future reductions in the cost of operating the network
New to market – products, processes, and services

Revenues - creation of new revenue streams
Revenues - improved access to revenues for users of network services

Benefits Part 2

Throughout the project phases, the quantification of benefits will be refined from setting out the approach to Cost Benefit Analysis (CBA) in Discovery including defining the counterfactual, assumptions-based CBA in Alpha and using real-world data gathered during Beta stage to validate the assumptions and outcomes.

Financial - future reductions in the cost of operating the network

Measured by

- savings (average £/customer) from deferral of network reinforcement in the project area. Baseline for the future reduction on LV network reinforcement deferral based on the ED2 estimates scaled to the project area.
- Project LEO-N will give DNOs additional visibility of emerging network constraints, allowing more options to proactively manage future workload improving overall network efficiency.

Financial - cost savings per annum on energy bills for consumers

Measured by a relative reduction in overall bills for households and businesses provided with FutureFit Products and Services, and local energy market trading services, when compared against historic costs and/or premises with no equivalent measures fitted., considering vulnerability of customers.

Revenues - creation of new revenue streams

Measured by number of new revenue streams:

- made more readily available to domestic and small business customers from FutureFit Services and Products via local trading and access to wider flexibility markets.
- created in supply chain from supply, installation, operation and maintenance of FutureFit measures.
- Jobs created to enable FutureFit, and function of the Local Convener
- number of financial products created for businesses delivering FutureFit

New to market – products, processes, and services.

Measured by

Number of products, processes and services

- developed through FutureFit Products and Services
- number of funding routes available to households and businesses for decarbonisation
- created through introduction of local energy trading markets
- created through the development of framework for local convener and its interaction with LAEP

Environmental - carbon reduction – direct CO2 savings per annum against a business-as-usual counterfactual

Measured by (tCO2e) emissions reduction average per customer from reduced energy use.

Environmental - carbon reduction – indirect CO2 savings per annum against a business-as-usual counterfactual

Measured by (tCO2e) emissions reduction average per customer from not importing grid-generated electricity.

Additional metrics including indicators on housing stock improvement (e.g. average EPC rating), electrification of LCTs and DERS like EVs, Air source heat pumps, renewable electricity supply (e.g. GWh per generation type) and use of flexibility (e.g. % of households participating) will be used to assess the pace of progress on decarbonisation. These will be further developed as the project progresses.

Project Plans And Milestones

Project Plan and Milestones

Discovery milestones:

- Defined approach to CBA to including financial and environmental benefits
- Review current state of Smart Local Energy Systems (SLES)
- Outline Futurefit Customer Journeys for at least two customer groups
- Description of Service Coordinator (SC) and Local Convener (LC) roles along with proposed governance structure.
- Recommendation on proceeding to Alpha phase.
- Learning dissemination.

The Discovery phase will define a CBA and Statement of Requirements to allow the commercial, technical, and economic feasibility to be evaluated. This will also assess customer acceptability and allow a decision taken on proceeding to Alpha Phase. The Discovery Phase will be split into six work packages (WPs):

- **WP1 – Project Coordination (SEPD - lead)**
- **WP2 – Review of Smart Local Energy Systems (University of Oxford - lead):** Review of current progress on SCES and potential future developments, identifying barriers and opportunities.
- **WP3 – Business Case Development (Baringa – lead):** Develop CBA approach compared against agreed counterfactual for the LEON approach
- **WP4 – Retrofit to Futurefit Customer (Low Carbon Hub – lead):** Develop of initial customer journeys for at least two consumer types
- **WP5 – Service Coordinator (Low Carbon Hub – lead)** Develop roles and responsibilities of SC to develop “hyper local” opportunities for coordinating decarbonisation, inc revised modelling approach
- **WP6 – Local Convener (University of Oxford - lead)** Develop clear articulation of the role of the new convening body to provide local strategic direction for multiple actors to allow replicability at scale.

Alpha Phase milestones:

- Delivering the business case for LEON, with CBA for identified use cases.
- PoC model and minimum viable solution (MVS) for LEON along with stakeholder engagement.
- Further development of the role of SC and LC.

The output of the Alpha phase will be the MVS along with proposal for Beta.

Beta Phase milestones:

- Development and implementation of LEON methodology.
- Recommendation for implementation of LC and SC roles.

The key project risks with mitigations are:

- The scope of work is misunderstood, mitigated by having an established relationships with all partners from Project LEO
- The project deliverables are not delivered to time or quality, mitigated through regular engagement amongst partners.

We will define MVP and MVS for solutions being proposed in the project with clear value propositions. This allows flexibility to work through multiple, and often complex, options in a systematic and robust way.

We have not identified any current regulatory constraints that would impact Discovery Phase, however, we recognise that this may change as the project progresses.

Regulatory Barriers (not scored)

At present we do not anticipate any Regulatory barriers to the delivery of the Discovery phase. However, this is a fast changing and dynamic area where there is a developing ongoing policy and regulatory landscape which may impact the future phases of the project,

such as :

ELEXON BSC modifications

A number of benefits enabled by FutureFit services could require approval of the Elexon BSC modification P441 'Creation of Complex Sites Classes', which will provide clarity and consistency on approach to netting of Imports from Exports for multiple Metering Systems registered in Supplier Volume Allocation.

Energy Smart Appliances Standards

BSI standards PAS 1878 and PAS 1879 are designed to enable demand side response from smart appliances, EV chargers, energy storage and electrical heating. Consequent additions and modification to the standards related to energy smart appliances (e.g. minimum cyber security regulations) could have unexpected effect on interoperability of existing systems.

Future of Local Energy Institutions and governance

The role of local authorities in participation of LAEP organization needs to be mandated at the level of central Government to ensure local authorities have sufficient resources to engage with LAEP process and support the role of Local Convener. Ofgem's consultation on the local energy institutions and governance is expected to be concluded in early 2023 and the outputs will be considered in the Discovery stage.

The project team will ensure that future phases of the project are developed in alignment with any relevant policy changes, and that any barriers are clearly identified.

Commercials

Route To Market

For LEON to be successful, it needs to be treated as a system and be adopted into BaU across the whole system, for example:

- LEON will support SSENs work on LV flexibility, connections and local area planning. The project is sponsored by SSENs Director of System Operation to ensure that it is well positioned for adoption to BaU, including future R100-ED3 proposals. The key route to wider industry will be the ENA Open Networks and LCT working groups;
- The LCH is extending its existing services for households and businesses and expects to develop a business plan and funding strategy to deliver at scale in Oxfordshire, recognising that the integrated design provides value to both the end customers and networks that can be monetised;
- Local authorities will be developing a long term viable financial model for the unable to pay segment, building on learnings in other programmes;
- The new local institutional infrastructure envisaged will provide the enabling environment to allow implementation at scale, helping inform future policy direction. Appropriate governance models and financial models will be developed.

Customer value proposition and associated business case:

- Decision support to consumers to navigate a complex journey to energy efficient buildings aligned with network requirements;
- a comprehensive service delivering high quality solutions that provide financial and environmental benefits with certainty and reliability;
- potential revenue streams from trading flexibility and energy services.

Our project outputs will not undermine the development of competitive markets because:

- SSEN will ensure that outputs are incorporated in an open and technology agnostic manner;
- The new institutional infrastructure will be available for other local authority areas;
- The LCH is a social enterprise and will share learning in an open way.

Who will be responsible for implementation of our innovation and why they are the best person or team to achieve this:

- As a whole system project, it requires all participants to contribute, a key output will be added clarity on roles and responsibilities to deliver the transition. Each partner will bring a focus to their area of expertise, LEON will inform the interfaces and information flows to ensure the best whole system outcome.

The purpose of this project is to de-risk the financial investment required to enable large scale decarbonisation using new products and services supported by new institutional arrangements. Whilst there is already a strong investor pool for these products and services, further work is required, across the whole-system to enable its delivery.

Intellectual property rights (not scored)

To ensure clarity is provided to the Project partners, UKRI and Ofgem regarding the intellectual property (IP) landscape, the Project is using an IP register to track the Background IP provided to the Project, the Foreground IP the Project generates, and the use and access rights to all this IP.

The main contract governing the Project (the Collaboration Agreement) will include detailed, mutually agreed terms governing IP that are in line with the SIF Governance Document. For the Discovery Phase, all the IPR arrangements will follow the default recommendations of Chapter 9 SIF Governance Document.

Costs and value for money

At this stage it is not envisaged that any subcontractors will be required for the delivery of the Discovery Stage.

The LEON project proposal has been developed to compliment and be additional to SSEN BaU activities and is aligned with other elements of our ongoing innovation work. The project focuses on developing products and services to allow homes and businesses to decarbonise more quickly and more efficiently, whilst enabling options for trading at local level. This will have a direct impact on the LV network, reducing the peak demand by allowing the option to better coordinate with the behind the meter interventions being proposed by Futurefit.

This should allow SSEN to better utilise the capacity available and make better informed investment decisions for both the local and upstream networks. The new institutional arrangements proposed intend to drive delivery of decarbonisation and allow better planning and coordination at local level, again this will allow DNOs to make better informed investment decision and facilitate the net zero transition at lower cost to customers.

Document Upload

Documents Uploaded Where Applicable

Yes

Documents:

10058729_LEO-N_ProjectDirection.pdf (1)

LEON_Discovery_EndOfPhase_FINAL.pdf (1)

LEON_Discovery_ShowTell_FINAL.pdf (1)

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This project has been approved by a senior member of staff

Yes