SIF Round 3 Project Registration

Date of Submission

May 2024

Project Reference Number

10061348

Initial Project Details

Project Title

Flex Direct

Project Contact

Innovation@ukpowernetworks.co.uk

Challenge Area

Novel technical, process and market approaches to deliver an equitable and secure net zero power system

Strategy Theme

Consumer vulnerability

Lead Sector

Electricity Distribution

Project Start Date

01/03/2024

Project Duration (Months)

3

Lead Funding Licensee

UKPN - London Power Networks Plc

Funding Mechanism

SIF Discovery - Round 3

Collaborating Networks

UK Power Networks

Technology Areas

Commercial

Modelling

Demand Response

Stakeholder Engagement

Project Summary

Procuring flexibility through energy efficiency upgrades being rolled out by Local Authorities and Social Housing Providers, such as home insulation and storage heating, offers a significant opportunity for DSOs to enable disadvantaged customers to participate and benefit from new energy markets. Flex Direct aims to transform the way this type of flexibility is procured by DSOs. The project will develop novel commercial models and coordinated market approaches to enable LAs and SHPs to operate as flexibility aggregators in direct contract with DSOs. This will incentivise use of energy efficiency in flexibility markets and facilitate participation of 'hard-to-reach' customers at scale.

Add Preceding Project(s)

NIA_UKPN0069 - Socially Green

Add Third Party Collaborator(s)

SIA Partners UK

Centre for Sustainable Energy

Imperial Consultants

Project Budget

£159,135.00

SIF Funding

£139,662.00

Project Approaches and Desired Outcomes

Problem statement

UKPN has committed to taking a 'flexibility and energy efficiency' first approach including a dedicated focus on delivering flexibility to 'hard-to-reach' customers, ensuring no one is left behind in the net zero energy transition.
UKPN's NIA-funded Socially Green project undertook research into the barriers that prevent disadvantaged customers from participating in and benefiting from energy flexibility markets and looked at opportunities to establish new mechanisms to enable the DSO to deliver services to consumers that would otherwise be excluded.
Procuring flexibility through energy efficiency measures, such as insulation and heat storage, being rolled out by local authorities and social housing providers has been identified as a key opportunity for DSOs to reach disadvantaged customer groups. This approach presents significant potential for network and consumer benefits through peak demand reduction, bill savings and carbon reductions.
However, flexibility aggregators' appetite to drive energy efficiency participation inflexibility markets has been low, with a greater preference applied to core demand-side-response flexibility solutions.
There are several challenges preventing progress:
Low awareness and engagement across the energy efficiency value chain: DSO flexibility products are complex, particularly for stakeholders whose core business is something else. There is generally low awareness and knowledge of flexibility products and the potential benefits across LAs, SHPs, energy efficiency installers and customers.
Timing issues: The timing between central energy efficiency funding and DSO flexibility auctions is not aligned. LAs and SHPs delivering energy efficiency upgrades are driven by government subsidy deadlines or natural intervention points, whereas the DSO currently runs flexibility procurement cycles twice a year.
Lack of measurement and incentives: Most governmental funding for energy efficiency does not have established monitoring requirements and therefore the true reduction in the energy-use post-installations is rarely measured by LAs. This makes it difficult to establish baselines to measure demand reduction, undermining the ability to understand network benefits and offer clear incentives.
The fragmented nature of the market means it's currently impossible for DSOs, LAs and aggregators to effectively work together to increase uptake of energy efficiency in flexibility markets.
Flex Direct aims to address these challenges by developing novel business models, incentives and coordinated market approaches to enable LAs and SHPs to operate as energy efficiency aggregators in direct contract with the DSO. The project aligns to the Innovation Challenge aim and focus area by exploring novel mechanisms for enabling greater uptake of flexibility by disadvantaged consumer segments.

Video Description

https://www.youtube.com/watch?v=9BM_vkacl5E

Innovation justification

Flex Direct aims to deliver an ambitious and step change approach in the way DSOs procure flexibility through the installation of energy efficiency measures. The project is innovative because it will develop a new market mechanism, allowing direct contractual and commercial arrangements between local authorities or social housing providers and the DSO, without the need for flexibility aggregators or traditional procurement cycles. This approach aims to address the information, incentive and coordination gap that is holding back the participation of energy efficiency as a flexibility solution for DSOs.
UKPN's Socially Green project delivered a GB first trial enabling the DSO to procure flexibility from a small group of 'hard-to-reach' customers through the installation of energy efficiency measures funded through the Social Housing Decarbonisation Fund.
Learnings suggest there is potential to establish direct contractual arrangements, technical processes and data sharing between the DSO and LAs or SHPs, essentially incentivising and upskilling them to operate as long-term energy efficiency flexibility aggregators in target areas. This type of direct relationship has never been tested before in GB.
During Discovery, the project will establish the market structure and inclusive design requirements for Flex Direct through research and engagement with LAs, SHPs and stakeholders across the energy efficiency and flexibility market value chains. Given the fragmented market, this will include establishing an ecosystem of partners to work together to define the optimal

solutions and incentives to tackle the systemic issues. The output of Discovery will include validation of the Flex Direct concept by stakeholders, an assessment of the potential network impacts and wider benefits, and a blueprint for scale.
The contractual model and framework that will be required for this type of approach is novel (current CRL, IRL, TRL between 1-2) and will require significant engagement with the market to design, develop and trial the optimal processes (CRL, IRL and TRL between 3-4 at end of Discovery).
This project aligns to Challenge 2: Novel technical, process and market approaches to deliver an equitable and secure net zero power system and Theme4. Considerable research, engagement and innovation will be required to develop Flex Direct, which would not be achievable as part of business-as-usual activity. Given the phased nature of SIF, the project is well suited to this mechanism as it will enable upfront research to understand the scale of potential benefits to networks, LAs and consumers ahead of solution development and testing, before widespread deployment.

Impacts and benefits selection (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 – direct CO2 savings per annum

Revenues - improved access to revenues for users of network services

Revenues - creation of new revenue streams

New to market – processes

Others that are not SIF specific

Impacts and benefits description

Flex Direct will provide DSOs with a new framework to unlock additional flexibility and wider benefits from energy efficiency measures. This has the potential to deliver significant value, particularly if the timing and the delivery of the energy efficiency installations is monitored and incentivised towards areas with network constraints and with high populations of vulnerable and disadvantaged customers.
As an initial baseline, the interventions from this project will be measured against the current DSO forecast of energy efficiency flexibility product uptake, the related thermal demand reduction and number of customers participating. The related benefits include:
Financial - future reductions in the cost of operating the network
Energy efficiency interventions and flexibility procurement can provide benefits for networks by deferring, displacing or avoiding the need for network reinforcement.
Metric: Model showing what reinforcement would be required if interventions were not applied.
Financial - cost savings per annum on energy bills for consumers
Participating in flexibility markets through installation of energy efficiency measures will result in a reduction in consumer bills. Additional financial incentives may also be introduced to encourage participation which would provide additional benefits to end customers.
Metric: Annual customer bill savings from interventions.
Environmental - carbon reduction -- direct CO2 savings per annum
Energy efficiency interventions are proven to reduce customers' energy consumption which in turn reduces carbon emissions from domestic energy use.
Metric: Tonnes CO2e reduced per year and associated £ valued (Greenbook traded carbon price) following intervention.
Revenues - improved access to revenues for users of network services
An increase in disadvantaged households participating in flexibility services.
Metric: Number of households participating in the flexibility services after trialling the interventions compared to the number participating prior to the interventions.
New to market -- processes
Stimulating the market and increasing uptake of energy efficiency and flexibility through new commercial models and standards. Wider potential benefits across DNOs if learnings are shared and adopted across the sector.
Metric: Documented processes that can be replicated across GB to unlock wider benefits beyond UKPN network area.

Others that are not SIF specific
Societal benefits:
The project will deliver additional wellbeing benefits to vulnerable and disadvantaged consumers. This includes quality of life improvements due to having warmer homes from energy efficiency measures and the benefits of ensuring vulnerable and fuel poor customers are able to benefit from energy market participation.
Metric: Social Return on Investment and customer satisfaction assessment of trial participants.

Teams and resources

Flex Direct brings together four partners for Discovery: UKPN, Sia Partners, The Centre for Sustainable Energy and Imperial College. This team has experience of successfully collaborating on previous network innovation funded projects operating at the intersection of flexibility markets and consumer vulnerability, putting them in an expert position to deliver this project.
UKPN has a strong track record in identifying and supporting consumers invulnerable circumstances. They have strategically combined their Consumer Vulnerability team with the innovation function, emphasising their commitment to supporting customers through innovation and inclusive design.
Role: UKPN is the lead network, responsible for overall project management and dissemination of information across the industry.
Sia Partners are regulatory, asset management and data science specialists in the UK energy sector. In recent years, Sia Partners has become known as a leading management consultancy in stakeholder engagement and consumer vulnerability for GB regulated utilities, with a wealth of experience. This has included several successful innovation projects focused on ensuring disadvantaged consumer segments are not left behind the energy transition, including UKPN's NIA funded Socially Green project and SIF funded Guidelight. Sia also has deep expertise in flexibility services and product design for energy companies in the UK and Europe, particularly for regulated energy networks.
Role: Sia Partners will lead on the design of the contractual frameworks and partnership processes following inclusive design principles
CSE is a charity supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes. They deliver practical work to support households and communities to take action on energy, alongside original research to inform local and national policy. CSE's research team has expertise in: housing and buildings energy efficiency and energy systems data analysis; low carbon technologies; consumer energy behaviour; fuel poverty; and fairness in the transition to a net zero energy system.
Role: CSE will lead social research and engagement with local authorities and social housing providers.
Imperial College Consultants (ICON) energy system research group have a long history in innovation, and bring a wealth of experience, expertise, and existing analytical tools focusing on modelling the impact of flexibility on the energy system.
Role: ICON will lead the CBA to assess the potential impact of the Flex Direct on the energy system and the benefits of scaling the solution
There are no planned sub-contractors and partners will leverage their own facilities (e.g. offices and IT).

Project Plans and Milestones

Project management and delivery

Project management will be led by UKPN using standard best practice methods and tools, including fortnightly management meetings and status reporting, more frequent stand-ups as required for design sprints, a RAID log, and a stakeholder governance schedule aligned with project timelines.
Risk Management: The project will employ robust risk management focused on risk identification, assessment, mitigation planning, monitoring and control, and communication. This is designed to minimise project overruns, control costs, and address potential challenges. A Risk Register will be regularly maintained and reviewed by project partners. The project has identified several risks that could impact Discovery as well as associated mitigations, as detailed in the PMT template.
Discovery includes four work packages:
WP1: Engagement with local authorities and social housing providers (CSE)
Aim: Engage with LAs and SHPs to increase awareness of energy efficiency flexibility and establish willingness, capacity and ability to participate in direct contractual relationships with the DSO.
Success criteria: Completion of engagement and delivery of report
WP2: Establish requirements for contractual framework (Sia Partners)
Aim: Establish requirements for contractual frameworks with LAs/SHPs. Including potential length of contracts, establishing baselines for measurement, incentive models, and technical requirements.
Success criteria: Framework requirements established that have been validated with stakeholders
WP3: Develop partnership ecosystem framework (Sia Partners)
Aim: Create a partnership ecosystem to align various stakeholders across the energy efficiency and flexibility value chain. This will seek opportunities for collaboration around the problem from a community of partners, with the aim of delivering improved outcomes by working together.
Success criteria: Mapping of stakeholders and design of partner ecosystem for further engagement in Alpha
WP4: Assess the benefits and opportunity to scale (ICON)
Aim: Produce CBA considering potential network, consumer and environmental benefits of scaling the Flex Direct approach across UKPN's network area and GB.
Success criteria: delivery of cost benefit analysis
WP5: Project management (UKPN)
Aim: Project manage the Discovery phase, own the risk register and fulfil all reporting requirements.
Success criteria: successful completion of the Discovery Phase
Any interdependencies between work packages, milestones and deliverables have been provided in the Gantt chart attached. There are currently no identified risks in relation to policy and regulatory changes. There is also no potential for supply interruptions to customers as Discovery focuses on stakeholder engagement and feasibility assessments. Future phases may involve direct engagement with consumers which will be confirmed during Alpha phase scoping.

Key outputs and dissemination

At the end of Discovery Phase, the desired outcome is to have validated the opportunity to establish direct contracts between the DSO and local authorities or social housing providers and to establish contract and incentive design requirements, a partner ecosystem framework and benefits case. The outputs will enable further testing and refinement of the contractual framework in Alpha, including development of appropriate tools and enabling infrastructure, and selecting stakeholders and sites for participation in future phases. This would lead to a Beta phase trial of the Flex Direct approach with a local authority or social housing provider.
Key outputs from Discovery
By the end of Discovery, Flex Direct aims to complete the objective of each work package (Q7) and produce the following key outputs which will be disseminated effectively:
WP1 -- Local Authority and Social Housing Provider engagement report (CSE)
WP2 -- Contractual framework options and requirements report (Sia Partners)
WP3 -- Design of partner ecosystem to around tackling the challenge of facilitating uptake of flexibility from energy efficiency (Sia Partners)
WP4 -- Cost benefit analysis (ICON)
WP5 -- Mid point and end point reports (UKPN)

Dissemination approach
The purpose of our dissemination is to share the learnings gained through Discovery. The Flex Direct dissemination approach is developed based on UKPN's previous experience of running successful innovation projects.
We intend to leverage the connections of our consortium to effectively disseminate our learnings:
Engagement with stakeholders: actively engage with stakeholders such as LAs, energy suppliers, and other DNOs identified during Discovery ecosystem mapping, sharing learnings and insights from Flex Direct.
Online event and materials: Flex Direct will host an online event to share the project's outcomes. Outputs will be shared through local government networks and platforms and potentially through UKPN's Local Area Energy Planning tool.
CSE, Imperial College and Sia Partners' networks: partners will leverage their networks and contacts to disseminate the outcomes of Flex Direct ensuring wide reach and impact.
Public summary report: A public summary report highlighting the key deliverables and learnings of the Discovery phase will be published on the UKPN innovation website.

As detailed above, the outputs and learnings of Flex Direct will be made available to all networks. The novel approaches that will be explored and developed have the intention of being replicable across the sector and therefore does not undermine competitive markets.

Commercials

Intellectual Property Rights (IPR) (not scored)

The project will follow the standard approach to IPR management as set out in the SIF Governance Document Chapter 9.

Value for money

The total project costs for Discovery is £159,135 with a SIF funding request of£139,662. Collectively the project team are funding a contribution of 12.2% of the total project costs. The contribution from each partner in the consortium, despite difference in the size and nature of organisations, evidences the commitment to provides value for money to customers.
The budget is allocated proportionate to the delivery role that each organisation holds in Flex Direct. This is balanced across the project partners as follows:
UKPN
Total costs: £22,200
Total contribution (labour in kind): £2,220 (10%)
Total SIF funding requested: £19,980
Sia Partners
Total costs: £85,500
Total contribution (labour in kind): £12,825 (15%)
Total SIF funding requested: £72,675

CSE
Total costs: £36,075
Total contribution (labour in kind): £1,356 (3.8%)
Total SIF funding requested: £34,719

ICON
Total costs: £15,360
Total contribution (labour in kind): £3,072 (20%)
Total SIF funding requested: £12,288

There will be no sub-contractor costs, nor any other additional funding from other innovation funds.
Flex Direct represents great value for money because:
Established partnerships: The project concept has been developed by Sia Partners, CSE and UKPN by drawing upon direct learnings from previous research and innovation programmes such as UKPN's Socially Green project and CSE's Smart & Fair research programme. The consortium has considerable experience working together to design and deliver inclusive solutions for vulnerable and disadvantaged groups in the energy sector. This established partnership will enable the team to combine complimentary skill sets to deliver tangible and customer centric outcomes in the short time frames of the Discovery phase.
Competitive labour rates: CSE is a registered charity with no core funding. All its income is related to the projects and services it delivers. As a non-profit, it offers significant value for money in labour considering the level of expertise provided. Sia Partners are suppliers on UKPN's business consultancy framework and were appointed following a competitive procurement exercise which included rates negotiations and an assessment of value for money.
Bespoke modelling: For this project, ICON are offering their bespoke models and tools at no charge to help deliver the assessment of potential network impact of the potential additional flexibility unlocked by the Flex Direct approaches and the associated benefits to customers and the environment.
The route to potential commercialisation of the innovation, as well as the development towards business-as-usual, will be key learnings from Discovery and future Alpha.

Supporting documents

File Upload

Flex Direct R3 Discovery Show and Tell Final.pptx - 6.2 MB
Flex Direct R3 Discovery End of Phase Final.pptx - 6.5 MB
SIF Round 3 Project Registration 2024-07-08 10_34 - 60.3 KB
SIF Round 3 Project Registration 2024-05-13 10_17 - 60.2 KB

Documents uploaded where applicable?

☑