

Project Local Energy Oxfordshire

Oxfordshire County Council
Friday 22 January 2021

Summary

Project LEO is a £40m partnership project part-funded by InnovateUK. It brings together a range of public and private sector partners to demonstrate how a smart, flexible electricity network in Oxfordshire can support the increasing demand from planned growth and from the electrification of heat and transport. These changes in electricity demand need the network to adapt in a way that supports the country's net-zero targets. Project LEO is seeking to unlock the local solutions required to address this global challenge.

LEO is helping us to understand how new markets can be created to support a more flexible electricity system, with communities and technologies supported to play an active role in a local balanced electricity network and a transition to Net Zero carbon.

Our problem

Oxfordshire faces a problem: there is an anticipated increase in electricity demand and we need to ensure that the network is ready for this. Traditionally the network operator would address an increase in demand by putting in new hardware and machinery. Electricity demand fluctuates significantly hour by hour and the network needs to be engineered to handle the highest peaks in demand although they only occur very briefly. This can be expensive, disruptive and does not support the country's net-zero ambitions.

Rather than building new infrastructure to accommodate peak demand, we need to create a smart, decentralised energy system that supports local flexible renewable energy generators and can help us to meet energy demand at all times of day or night. Local households, businesses and communities also need to shift when they use electricity to help flatten out the peaks and troughs of electricity demand. Being paid to do this will create a local flexibility market.

Overview

The UK's electricity system is changing. In a bid to fight climate change, we're seeing more small-scale renewables and low-carbon technologies create opportunities for consumers to generate and sell their own electricity and store electricity using batteries. Electric vehicles can also help reduce peak demands on the electricity grid by charging at times of low demand or abundant supply. Distribution Network Operators are changing to become Distribution System Operators (DSOs) to ensure that this can happen.

Project LEO is one of the most innovative, wide-ranging and holistic smart grid trials to be conducted in the UK to date. Its purpose is to improve our understanding of how opportunities can be maximised and unlocked during the transition to a smarter and more flexible electricity system - informing how DSOs operate in the future. It's about looking at how we can manage our energy demand (for heating, cooling, charging electric vehicles etc), supply and storage. We want to understand what value a new flexibility market could bring to local households, businesses and communities.

LEO is also developing the tools and processes to plan the new local energy system so that new housing and commercial developments are brought forward in an efficient and effective way alongside new electricity supply and demand. Oxfordshire County Council is working alongside Oxford Brookes University to create a spatial energy mapping tool to support energy systems planning at strategic and community scales.

Why Oxfordshire?

There are ample opportunities to test the benefits of operating the electricity grid more flexibly and to create and test new flexibility markets.

There is a very well-established network of people in Oxfordshire who have been working together on energy innovation for a long time. All six local authorities are all working together to meet the Climate Emergency; Oxfordshire has an ambitious energy strategy and citizens across the City and County are vocal in their demands for change and inventive in their suggestions for how it could come about.

Timeline / project progress

The project started in April 2019 and is due to end in June 2022.

In the first year of this three-year project, partners developed 'Minimum Viable Systems' (MVS) that allow the controlled management and monitoring of low-carbon technologies' impact on the network. The MVS trials that have been completed tested a range of scenarios that the UK's energy system will likely experience in the transition to a smarter electricity system. These tests will continue throughout the project, becoming larger and more complex

Project LEO was given the green light to move onto the second stage back in May 2020. This next step involves testing in a 'larger and more complex fashion', according to Scottish and Southern Electricity Networks and will include trials gathering learning about the markets, technology and mechanisms used to trade flexibility.

Stakeholders

The project is a collaboration between:

- Low Carbon Hub (Oxfordshire social enterprise, leaders in community energy)
- Scottish & Southern Electricity (the Distribution Network Operator)
- The University of Oxford and Oxford Brookes University
- Oxfordshire County Council and Oxford City Council
- Commercial partners (market platform and commercial trade)

Project LEO is funded through £13.8m from the Industrial Strategy Challenge fund, managed by Innovate UK and supported by £26m of private funding from the project partners. As such, it is required to demonstrate to Innovate UK that it is making strong progress in delivering its objectives of developing a smart local energy market in Oxfordshire.

Whole systems approach

For Oxfordshire County Council, the LEO project is one of the cornerstones of the [Climate Action Programme](#), a framework designed to guide the council to become carbon neutral by 2030 and play its part in helping the county reach Net Zero by 2050. The data and tools developed through LEO will provide the evidence base to inform

strategic planning and support delivery of the [Oxfordshire Energy Strategy](#) and the carbon reduction targets set within that.

Project LEO brings together significant local, academic and industry expertise and experience which means that it is able to take a holistic and wide-ranging approach.

Impact

The project is expected to unlock additional network capacity through the use of flexibility, rather than infrastructure investment and improve the utilisation of the existing network. It will demonstrate how households, businesses and communities can participate in the smart local energy system and realise the benefits. The overall impact of the project won't be clear until 2022, when it's due to finish.

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Replication is crucial to this project – what LEO learns, and the project's outcomes, will be shared nationally to enable other areas to benefit from this and establish smart local energy networks of their own. Data generated is being used for research, with all learnings being logged and distilled to contribute to national and international replication low-carbon initiatives.

The current policy and regulatory environment is being considered and we are identifying opportunities where changes to policy and regulation could help enable our project aims and ultimately the country's net-zero ambitions. The project is aiming to create the tools to support the development of a local energy market in Oxfordshire, including an ambitious series of maps that can be developed and combined with one another. With local authorities having ownership of the mapping tools – a crucial element in understanding and managing the system and planning for further developments, we anticipate ongoing support for and access to the tools beyond the funded project.

Innovate UK has announced that LEO's project partners have demonstrated strong progress, evidenced through a comprehensive submission for the first year. Project LEO will now develop larger energy trials, building on learnings from the initial phase of the project.

Contact details

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