

Project LEO Newsletter



Newsletter

September 2020, Issue 5



Local Energy Accelerating Net Zero

Project LEO aims to test how opportunities can be maximised and unlocked from the transition to a smarter, flexible electricity system, with a focus on renewable and low carbon energy.

Smart and Fair Neighbourhoods Launch

As part of LEO we are pleased to announce the launch of a new *'Smart and Fair Neighbourhoods'* programme working with seven neighbourhoods around Oxfordshire. The programme aims to provide opportunities to put renewable energy generation at the heart of a smarter, low carbon, more locally focused energy system.

The Smart and Fair Neighbourhoods programme (SFN) will help us to understand how to do this in an equitable and fair way for everyone in Oxfordshire. It will involve local, low carbon energy trials, which include smart technology and new commercial models that explore opportunities in a prototype local energy market place.

Each trial will be based in a particular area, or neighbourhood, around an electricity substation. We have focused on areas that face more challenges to network managers as patterns of demand and supply change.

In the past the solution to dealing with capacity challenges would be to upgrade the network with costly new equipment and the disruptive digging-up of roads. Our aim is to find new ways of 'balancing' electricity supply and demand using new technologies and practices and prove this as a viable alternative to network upgrades, whilst ensuring a safe and secure electricity supply.

One of the challenges in doing this, is that demand fluctuates due to all sorts of reasons, not just varying with the seasons, or even daily, but minute by minute. To make sure electricity supply and demand are in balance, the local network needs to be more 'flexible' and adaptive to changes in generation and demand.

Our Smart and Fair Neighbourhoods are;
Deddington, Eynsham, Kennington,
Osney Island, Rose Hill, Hook Norton
and Westmill

We need to use and develop new technologies and practices, including electricity storage using batteries (including electric vehicles), software tools that gather and make sense of network information, and manage demand where this can be done without disrupting services to customers – for example, through switching water heaters on when there is plentiful a supply and off when supply is tight. This approach, called a 'demand side response', unlocks new

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Smart & Fair Neighbourhoods Launched



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opportunities for businesses, households, and communities to be paid for being more flexible and adaptable in how they use electricity.

It is in all our interests that no one is left behind in the transition to a zero carbon energy system. Opportunities must be available to all businesses, households, and communities. Any new, locally balanced energy system, needs to benefit and be fair for everyone, not just a minority with their own solar panels, battery storage or electric vehicles.

As with other commodities, energy can be bought and sold in a market place where there are buyers and sellers and someone to manage the market. There are also markets where flexibility is traded – the ability to shift demand in time.

Taking a place-based (or neighbourhood) approach to re-imagining the energy system, is key to achieving benefits for everyone. It helps entire communities come together to pool resources into new flexibility markets, whilst identifying and negotiating the benefits they want to receive for helping balance the local energy system.

We call these benefits ‘place-based value’ and are looking to achieve outcomes such as:

- Improving community resilience
- Working towards District, City and County Council goals to reach net-zero carbon emissions
- Generating community benefit (such as income for spending on community projects)
- Reducing air pollution

Smart and Fair Neighbourhood trials will include technical, social, commercial, governance and regulatory innovations, and LEO’s aim is to develop all of these while safeguarding electricity services.



A local energy market buys & sells electricity instead of fruit and veg, but everyone still has to be able to get access to the market to get a ‘good deal’.

Our webinars are full of energy!

We have been busy delivering a programme of webinars over the last few months so that everyone can stay in touch with the project and what it is learning, even during Covid restrictions.



Don't worry if you've missed some, as they are all available to watch again on our website along with details of any new events we are planning.

Visit the events page at www.project-leo.co.uk/leo-events

www.project-leo.co.uk

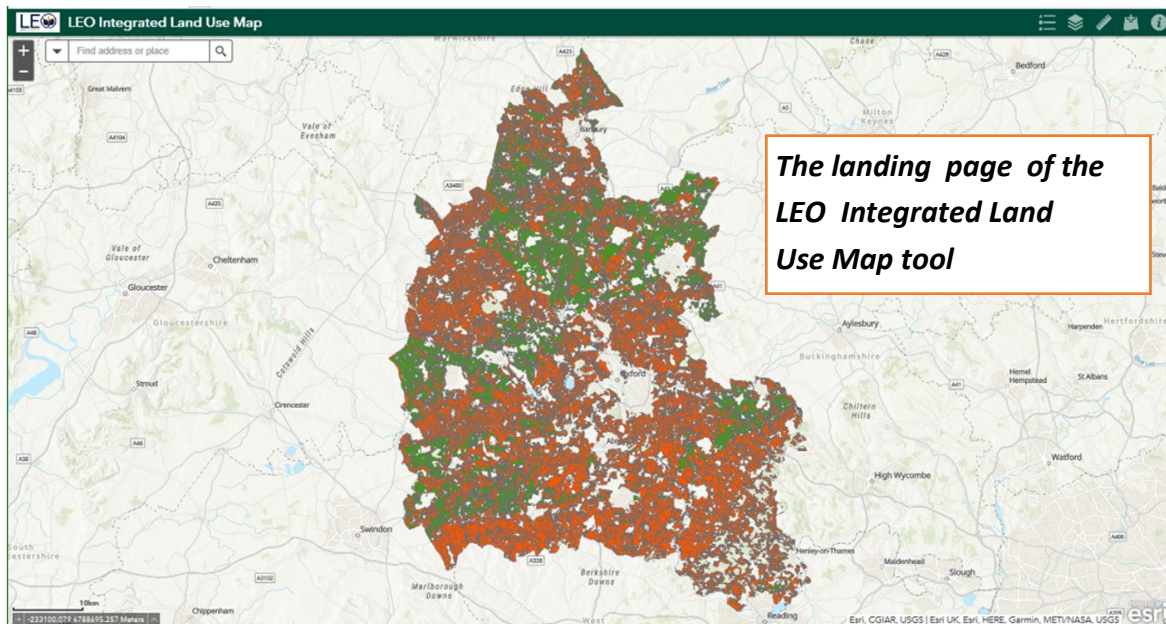
Getting LEO on the map

LEO develops new Local Energy Mapping Tool



We are delighted to tell you, the LEO Integrated Land Use Map has been launched! Created by the Energy Insights and GIS teams at Oxfordshire County Council, the LEO Map is the first phase in a project to provide spatial and temporal intelligence to support energy systems planning in LEO and beyond. The map draws together over forty layers of data to give an accessible overview of land use designations, planned developments and energy assets within the Oxfordshire county area.

In line with other workstreams in the project we've developed the map using the 'Minimum Viable System' approach. We've identified the need for the map, consulted the people we think will use it and checked what they might use it for. Our GIS team created a web application to host the data and make it available to LEO partners. Our Work Package 4 partners at Oxford Brookes University tested and reviewed the working version; the updated web application is now available to LEO partners (and licensed through the Public Sector Geospatial Agreement) and accompanied by a user guide for anyone who needs it.



The LEO map includes spatial data held by Oxfordshire County Council (including environmental and landscape designations, agricultural grade, flood risk zones, planned housing and employment), or publicly available data through national databases (eg location and installed capacity of existing renewables). We've also included a new data set created for LEO by Energeo Limited, indicating areas across the county which may be suitable for installation of additional renewables at a variety of scales. We hope this will be of use not just to LEO but for planning purposes more widely, for example to aid identification of potential sites for strategic-scale renewable generation for consideration through the emerging Oxfordshire Plan 2050 (the county's Joint Statutory Spatial Plan).

The LEO Map is currently available only to members of the LEO team, but **will continue to be developed and made available to a wider audience** over the coming year, with the addition of further data sets (including socio-economic indicators) and functionality – all informed by the needs of the project partners and other key users across Oxfordshire. If you would like to input into the further development of the map or have questions please contact Inga.Doherty@Oxfordshire.gov.uk

Low Carbon Hub celebrates reaching investment target



In our last edition we encouraged you to consider investing in the Low Carbon Hub. They were aiming to raise £1.5 million to enable them to continue their work across Oxfordshire, developing community-owned renewable energy projects.

We are delighted to report they reached their goal!

With a climate of financial uncertainty for many at the moment this really is an incredible achievement, so the Low Carbon Hub would like to say a very big **thank you** to everyone who invested.

If you missed the opportunity to invest this time around or it just wasn't the right time for you, keep an eye open on the Hub website where any new opportunities to invest will be announced first.

www.lowcarbonhub.org/invest/



Reviewing Local Energy Mapping Platforms

To support and guide the development of the [LEO Mapping tool](#), Prof Rajat Gupta and Dr Angelines Donastorg Sosa have been reviewing other existing local energy mapping platforms and tools to gain a deeper understanding of their scope, technical features and limits.

LEO has launched, and is further developing, its special mapping tool, because both platforms and tools are increasingly being required to support the visualisation and targeting of smart local energy projects. When working on a local level these can help us to understand the unique characteristics of the local area so that solutions are fit for purpose even down to an individual property level.

The review showed there is currently a focus on energy, and more specifically electricity, mapping platforms and very little which looks at other elements of the wider local smart grid picture, such as heating or transport. Most of the platforms/tools that were identified are funded by Government and developed by the private sector for a specific niche audience.

The platforms we found generally do provide national coverage, but the tools tend to be more regional or even city level. This isn't surprising when you consider the amount of detail required and the availability of the data sets which would be needed for a national tool. Any data at a specific property level we looked at was aggregated so did not truly reflect the energy picture for that property.

The review identified 18 local energy platforms and 17 mapping tools nationally and internationally available online. The platforms offered a visualisation of spatial energy data with no (or limited) customisation of the spatial data. The tools are interactive so allow visualisation, analysis and customisation of the available spatial energy data. Unlike platforms which give information one-way the tools have a two-way flow of information.

If you would like to read more about our findings and the platforms and tools we identified visit the LEO library www.project-leo.co.uk/library/

Background image taken from National Heat Map

Annual LEO Data Workshop engaging participants

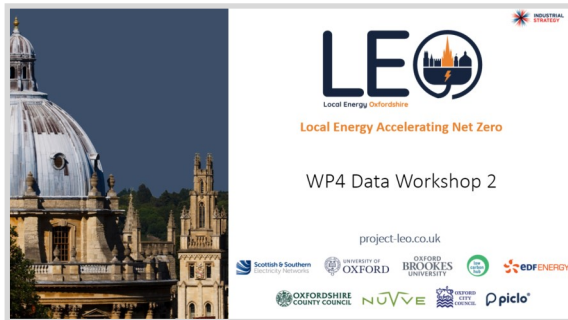


In July we ‘virtually’ held our annual LEO Data Workshop. This was the second of three planned Project LEO Data Workshops. This one was kindly hosted by the University of Oxford, Oxford Brookes University, and Oxfordshire County Council.

We hold these workshops to determine the main data and tool gaps within Project LEO, including the main stakeholder needs in relation to our Integrated Land Use Mapping tool.

We were delighted to welcome 54 participants in the workshop, who joined us to hear introductions for the session ahead, given by David Wallom from the University of Oxford. These participants represented 26 different organisations. Engaging discussions were led by Project LEO partners on key relevant concepts around data management and utilisation, with specific focus given to our [Integrated Land Use Mapping tool](#).

Much of the day was spent in virtual breakout sessions for the [mapping tool](#) and around data management discussions for the LEO MVs (Minimum Viable Systems). Attendees and moderators worked through key questions around the data requirements and services for each of these core elements of LEO’s data.



The workshop was very successful and we have sought to update our catalogue of available and relevant datasets through the second iteration of the [LEO Data Survey](#).

The Survey helps us map the existing and upcoming spatial and temporal datasets related to energy systems in Oxfordshire. The current Survey is now open if you would like to take part <https://tinyurl.com/y3lzz426>

Energy Superhub Oxford

LEO is not the only energy project in Oxfordshire. We are linking to several other key projects across the county, one of these being Energy Superhub Oxford (ESO).

The project will be installing an Electric Vehicle (EV) charging network – connected to the National Grid’s extra-high voltage transmission network, which will bring an unprecedented amount of power to Oxford for rapid vehicle charging, the charging of big vehicle fleets, and the addition of new chargers as the demand grows. The hybrid battery they will be using is the first of its type in the world to explore the synergies of lithium-ion and vanadium flow technology from flow specialists *Invinity Energy Systems*, who will incorporate a new Overdrive (extra power) mode into the battery.

Innovative, small ‘shoebox’ ground source heat pumps will show one way in which we can help to eliminate the carbon associated with heating our homes and businesses.



ESO’s Optimisation and Trading Engine underpins the project. This will control the activity of the battery and the EV chargers so they automatically use cheaper, cleaner electricity when available. The heat pumps will also use newly developed smart controls to optimise comfort and cost for residents.

The whole system will be operational from early 2021.

Sandford Hydro trials - feeling the force



LEO is continuing its trials using Sandford Hydro to understand how we can use it more flexibly to support the local electricity grid when demand for electricity is high, or to reduce generation when it isn't needed.

We have been investigating how we can use the river as a form of energy storage to increase generation. The output of Sandford Hydro is dependent on the force of the moving water that spins the turbines, so by increasing the force of the water we can increase the output.

Generation can be turned up or down in response to requests from the Distributed Systems Operator (DSO) who manages the local distribution of energy through the electricity grid. In project LEO the DSO is SSEN.

The results of our most recent trial are still being analysed but are looking very promising. Initial data suggests we achieved a temporary increase of around 40 kW - **twice the output from before the beginning of the trial!**



Stakeholders at the heart of LEO

LEO's stakeholders are all the people, or groups of people, who may either affect, or be affected by the project. Engaging with our stakeholders effectively is vital to the success of the LEO project.

To help achieve this we have committed to making sure that;

1. The energy system is understood as a socio-technical system
2. We are compliant with relevant statutory, industry and good practice requirements
3. Engagement is informed by the needs & priorities of stakeholders
4. Engagement enables learning and replication by others
5. Engagement is evidence-based
6. Engagement is reflexive
7. Engagement is ethical & inclusive
8. Engagement is aligned to our project needs

We have expanded on these eight principles and set out our high-level stakeholder engagement approach in our new 'Stakeholder Principles Document'. This sets out our building blocks to ensuring we talk to the right people, in the right way at the right time.

Our Principles document can be read here www.project-leo.co.uk/library/

The LEO partners are....



Project LEO is funded through £13.8m from the Industrial Strategy Challenge fund, managed by UKRI, and is supported by £26m of private funding from project partners.

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