



BRIEFING

EnergyREV

What does 'local' mean in emerging UK smart local energy systems?

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Summary

Smart local energy systems (SLES) are decentralised energy projects that seek systemic solutions to decarbonising heat, power and mobility. But other than signalling smaller-scale projects, what does 'local' in smart local energy systems actually mean? What types of locations are suitable to host SLES projects? How are project boundaries decided upon? And how do SLES relate what is going on locally to the wider national energy system? Using a unique qualitative dataset made up of project stakeholder workshops and online secondary documents, we have applied qualitative analytical methods to investigate what 'local' means in three case study demonstrator projects of SLES funded under the Innovate UK Prospering From an Energy Revolution (PFER) programme: Projects LEO, ESO and ReFlex.

We have identified three ways that the stakeholders make their SLES projects 'local'.

- **They use narratives to show why their local areas are ideal places to implement smart local energy projects.** These narratives make connections between a proposed SLES and the distinctive infrastructural, social, ecological and political characteristics of diverse locations (the city of Oxford, Oxfordshire, the Orkney Islands).

- **The spatial boundaries of the projects are set loosely and flexibly rather than being fixed.** They are reorganised and updated over time in pragmatic ways as circumstances change.
- **They emphasise local benefits of SLES, but to different degrees.** More locally embedded stakeholders (i.e. councillors, community energy groups, academics) give similar weight to local and non-local benefits. However, non-local stakeholders (particularly industry partners from outside of the local area) often have a primary goal to produce replicable models that can be scaled up elsewhere, even if some local benefits are recognised and sought. This shows the diversity of views within and across project teams.

These insights can inform a policy agenda about how to encourage and support SLES. They show how programme funding goals and language shape demonstrator projects, and how future programmes can retain a balance in their emphasis upon local benefits and system wide scaling up. They suggest the value, but also some tensions, in retaining a flexible definition of spatial boundaries and the scale of what 'local' means in SLES. They also raise important justice and acceptability issues that require genuine engagement with local communities to ensure that the decisions taken by project stakeholders about 'local' projects have legitimacy and credibility.

Table 1: SLES Project and data descriptions

Project	Workshop participants (all names are pseudonyms) ^{1,2}	Secondary documents (SD)	Total documents
Local Energy Oxfordshire (LEO) "Project LEO is one of the most ambitious, wide-ranging, innovative, and holistic smart grid trials ever conducted in the UK."	Six participants (Workshop 1) <ul style="list-style-type: none"> • Sean (Industry - Network Operator) • Will (Industry - Network Operator) • Thomas (Industry - Network Operator) • Meghan (Community Organisation) • Susan (Academia) • Peter (Academia) Three participants (Workshop 2) <ul style="list-style-type: none"> • Carol (Local Council) • Katelyn (Local Council) • Olivia (Local Council) 	Google.co.uk 14 documents (n=7 project stakeholder updates/news, n=7 independent news) Project website 17 documents	33 (2 workshop transcripts and 31 secondary documents)
Energy Superhub Oxford (ESO) "As a key part of Oxford City Council's response to the climate emergency, ESO will provide a model for cities around the world to cut carbon and improve air quality."	Five participants <ul style="list-style-type: none"> • David (Industry) • Mary (Academia) • Lois (Industry) • Anne (Industry) • James (Industry) 	Google.co.uk 16 documents (n=9 project stakeholder updates/news, n=6 independent news, n=1 video) Project website 18 documents	35 (1 workshop transcript and 34 secondary documents)
ReFLEX Orkney (ReFLEX) "The idea is to integrate electricity, transport and heat networks in Orkney using advanced software to balance demand and supply."	Seven participants <ul style="list-style-type: none"> • Oliver (Industry Research Centre) • Emma (National Community Energy Organisation) • Adam (Industry Research Centre) • Lauren (Industry) • Joseph (Local Council) • Jacob (Local Council) • Liam (Industry) 	Google.co.uk 18 documents (n=5 project stakeholder updates/news, n=12 independent news, n=1 video) Project website 10 documents (includes n=1 linked BBC Sounds program)	29 (1 workshop transcript and 25 secondary documents)
Total participants /documents	21 (LEO=9, ESO=5, ReFLEX=7)	93 (LEO=31, ESO=34, ReFLEX=28)	97

Opening up the idea of 'local' energy

As policy makers aim to decarbonise electricity generation, transportation and heating, technologies are being implemented that make these systems more decentralised; that is closer to where people live, work and take leisure. This raises important social and political questions about the geography of new energy systems, and in particular what 'local' in 'smart local energy systems' actually means. Other than signalling a shift away from massive power stations that feed directly into the national grid, the spatial extent of SLES remains unclear. To clarify this issue requires the application of a geographical perspective that analyses how SLES becomes embedded in particular places. As stakeholders are tasked with driving the implementation of actual demonstrator projects, and as policy makers seek to support such a shift to decentralised energy projects, it is timely to observe real-world case studies for what they reveal about new and emerging geographical configurations of the decarbonised energy systems of the future. In particular, analysis of demonstrator projects can be informative for indicating how stakeholders ground SLES projects within particular spatial contexts, with their own unique characteristics; how project boundaries are imagined and decided upon; and how what is going on locally is related to the wider national energy system.

How did we analyse data on 'local' energy?

This report is based on qualitative data, since we are interested in how project stakeholders talk about and describe the local aspects of their projects. Data comes from two sources (see Table 1, on page 2). First, we conducted four workshops with stakeholders from SLES demonstrator case studies in late 2019 and early 2020. In each workshop, participants were engaged in conversations and a pattern-making task¹ to reveal their views about local aspects of SLES and user engagement. Workshop participants included stakeholders responsible for the development and operation of each project.

These included representatives of industry, academia, research centres, local councils, and community organisations (see Table on page 2).

Second, we analysed material from project websites to identify similar material drawn from press releases, newsletters, reports etc. A total of 93 documents were identified as relevant for analysis. We used qualitative analysis software to code all of the data collectively, searching for themes concerning 'local' that we could subject to further analysis.

What does 'local' energy mean to stakeholders implementing demonstrator SLES?

Making SLES projects 'local'

SLES demonstrators are taking place in highly diverse locations, from urban contexts with Project ESO, to island archipelagos in Project ReFlex. Despite this diversity, project stakeholders in each of our case studies used similar narratives to make their projects seem both relevant and suited to their localities. Stakeholders identified unique characteristics of their local areas and made connections as to why this provided a suitable context for technology deployment. These characteristics were social, ecological, political and infrastructural. For example, in Project ESO, Oxford was positioned as an ideal, top ranked city context for innovative energy projects:

David (Industry): Did you see the... Good Growth Report? Which has 50-odd cities or towns in it and Oxford is number one by a long way in terms of it's sustainable... not just business sustainable growth but as a place to live and all the benefits that you have... So [Oxford is] already in a good place... (ESO Workshop)

In Project Leo, project stakeholders identified local characteristics such as distribution network constraints, community energy initiatives and political support. In Project ReFlex, they noted abundant natural resources, longstanding history of innovation and creative local people. For example:

¹ Devine-Wright, H. (2020) Pattern-IT: A method for mapping stakeholder engagement with complex systems. *MethodsX*, Volume 7, 101123.

Matthew (Industry): We can have all the wind and solar farms we want but unless we have the means to store and balance renewables we will never fully wean ourselves off fossil-fuels... Orkney is a perfect location to demonstrate [SLES]. (SD)

Despite diverse geographical contexts, in each location we observed a similar activity where project stakeholders use these very specific narratives to justify why these places are ideal for progressing SLES.

Setting SLES project boundaries

We found that project boundaries are set loosely and flexibly rather than being fixed or set in stone. Perhaps indicative of the early stage of project development, boundaries were not always clearly set or known at the time that our research was conducted. Stakeholders were still in the process of working out where their projects were going to take place and therefore where spatial boundaries would be drawn. In this process, the identification of technological assets was seen as imperative. For example, with Project LEO, stakeholders described that once flexibility assets were identified, specific project boundaries could be drawn. In Project ESO, the identification of landlords willing to participate was seen as crucial in designating where the project took place:

Lois (Industry): The houses that participate... that depends on take-up with the landlord, not geographic location... we're looking at Oxfordshire, not just Oxford, because we can't get enough housing. Well we can't get enough landlords to sign-up in Oxford city so we've had to extend it. (ESO Workshop)

In these cases, boundaries were often considered quite vaguely at initial stages, and then updated, expanded or refined over time in pragmatic ways as projects develop or circumstances change.

Balancing local vs. non-local project goals

We found that the emphasis upon local and long term goals of projects varied depending on which type of project stakeholder was involved.

Particularly for industry partners who were not from the local area, project goals were most likely to be framed as involving activities elsewhere. For these stakeholders, project success was often defined in terms of the degree to which external replication and scaling up took place.

This contrasted with the views of locally based stakeholders who emphasised both the value of projects for local communities and the opportunities that successful local implementation might bring by providing a model that communities elsewhere could take up and follow:

By creating opportunities for local communities to trade the energy they generate, use and store at a local level, Project LEO will show the potential for individuals, businesses and communities to collaborate in the creation of an energy system that's good for people and the planet. (SD)

This indicates how the PFER government programme shaped the goals of SLES stakeholders and how some stakeholders flexibly interpreted the funding framing arising from their values and interests. It also shows diversity within project teams. Stakeholders such as academics, councillors and community group representatives, who were locally embedded prior to the SLES initiative, stressed that project objectives centred around more 'local' themes including citizen engagement, participation, and ownership. While appreciating longer-term and non-local goals of SLES replication, including supra-national environmental goals at the planetary level, these stakeholders made clear connections both within and beyond the local context.

What are the implications for national and local policy for supporting SLES projects?

These insights can inform a policy agenda about how to encourage and support SLES. They show how programme funding goals and language shape demonstrator projects, when it comes to the relative emphasis upon system wide scaling up, replicability and non-local benefits such as longer term reduction in the costs of certain technologies.

In turn, they suggest how a **balanced emphasis** upon local as well as non-local benefits should be a primary goal of future SLES funding programmes, both short and longer term, for all participating stakeholders.

This would ensure that partner organisations without the locally embedded ties possessed by local stakeholders would adopt a similar emphasis upon locally positive and longer term outcomes. In related research, Rydin and Turcu (2019) found that decentralised urban energy projects led by non-local industry stakeholders were much less likely to be still going 10 years after initial funding in comparison with similar projects led by local and community stakeholders. The local duration and emphasis of SLES matters because SLES projects can have ripple effects beyond specific project goals, contributing to and encouraging the wider social and behavioural transformations required to reach net zero and tackle broader sustainability challenges such as biodiversity loss and pollution.

The findings suggest the value of retaining a **flexible definition of spatial boundaries** in SLES. The geographical units of SLES identified in this research are highly diverse in size and type – from urban and rural areas to island archipelagos. Therefore, there is no single ideal context for SLES, even if project stakeholders attempt to portray their own localities as ideal. This is positive for the potential applicability of SLES for systemic change across diverse contexts in the UK and elsewhere. However, flexibility in boundary making raises two important issues. First, in terms of justice, who has the power to decide where boundaries are located and whether they should change? Second, in terms of acceptability, how do stakeholder definitions of project boundaries relate to the lived experiences, attachments and identities of local communities? Will narratives of place and boundaries produced by stakeholders have legitimacy and credibility? Or will they be contested and opposed? To mitigate against such risks, project stakeholders should engage widely with local communities to ensure that views about what is ‘local’ about SLES are accepted as fair, legitimate and credible.

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About EnergyREV

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