UKERC
UK Energy Research Centre

Planning Works:

Local Energy Planning to Accelerate Net Zero

Jess Britton and Jan Webb

https://doi.org/10.5286/UKERC.EDC.000977

Contents

Introduction

Action by local and regional governments across Britain will be critical to accelerating the delivery of net zero energy systems[1]. Essential work on energy efficiency, deployment of heat pumps, heat networks and smaller scale renewables, electric vehicle infrastructure and demand flexibility can all be facilitated by local, rather than solely top-down, planning and implementation[2].

UK Government policy indicated that more locally integrated energy systems could reduce costs by up to £10 billion a year by 2050[3 4]. Place-based approaches to the net zero transition can also unlock wider benefits with research by Innovate UK and PwC indicating that a place-based approach to the energy transition could enable £108bn of consumer savings for an investment of £58bn[5].

More consistent and systematic local and regional energy planning can play a central role in enabling these whole system efficiencies. Many local authorities and partners are already developing detailed energy decarbonisation plans – whether Local Heat and Energy Efficiency Strategies (LHEES) in Scotland or Local Area Energy Plans (LAEP) in England and Wales. Energy network planning is also well established in the regulated electricity and gas network sectors.

Ofgem's 2023 decision to establish Regional Energy Strategic Planners (RESPs) adds a new regional dimension to energy planning and investment[6]. RESPs are expected to work with local organisations, including local government and gas and electricity network operators, to ensure accountable and coordinated strategic planning. The new UK Government therefore inherits a changing landscape of regional energy planning and governance. It has already committed to increase devolved powers over energy, transport, skills, housing and planning, including giving local leaders a direct say over energy plans. Partnering with local and combined authorities is also central to delivery of the Warm Homes Plan (England) and GB Energy. However finances in many local authorities are at breaking point and the new government fiscal rules constrain its ability to fund local delivery of net zero[7].

With these challenges in mind this report uses UKERC research findings on local and regional energy system development to make recommendations for effective local planning to accelerate net zero energy systems.

1 Climate Change Committee. 2020. Local Authorities and the Sixth Carbon Budget. Access here.
2 UKERC. 2024. Clean Heat Without the Hot Air: British and Dutch Lessons and Challenges. Access here.
3 UK Government. 2022. British Energy Security Strategy. Access here.
4 UK Government. 2021. Transition to a Net Zero Energy System: Smart Systems and Flexibility Plan 2021. Access here.
5 UKRI. 2022. Accelerating Net Zero Delivery. Access here.
6 Ofgem. 2023. Decision on Future of Local Energy Institutions and Governance. Access here.
7 Local Government Chronicle. 2024. Difficult dilemmas as net zero deadlines loom. Access here.

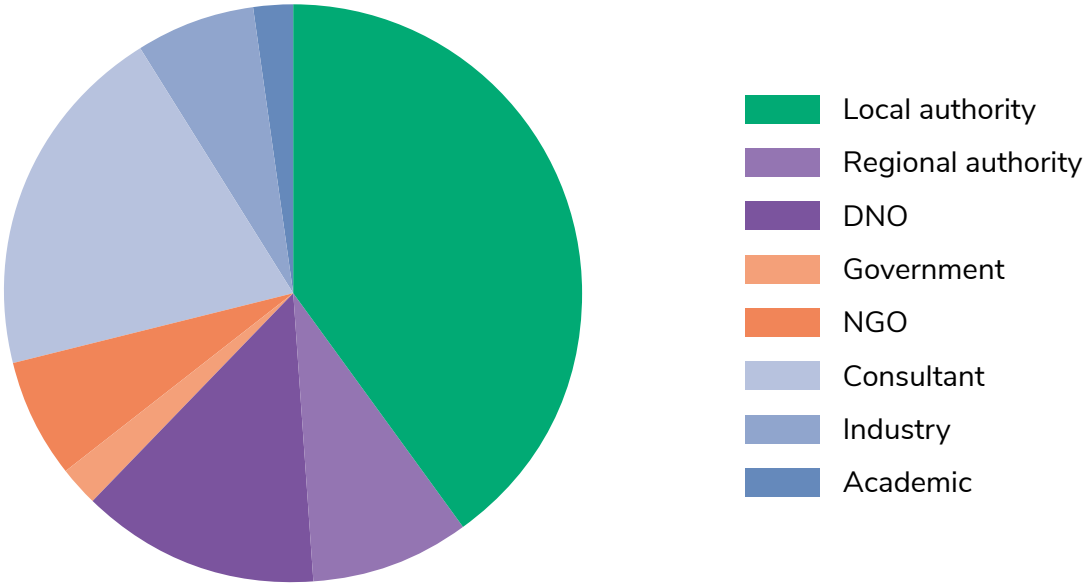
Summary of recommendations

- Consolidate learning from local energy planning across England, Scotland and Wales
- Develop a consistent framework for local energy planning
  - Standardise data protocols and access
  - Treat local energy planning as a process not an outcome: prioritise accessible and adaptable modelling tools, not one-off plans
- Integrate community and citizen engagement in local energy planning
- Focus support on translating plans into delivery and investment strategies

Method

UKERC research 2022 – 2024 investigated local energy planning in England, Scotland and Wales. We analysed policy documents relating to local and regional energy systems, conducted 45 interviews with stakeholders at local, regional and national levels, and convened a cross-sector workshop of 30 people on energy system modelling across scales[8].

Figure 1: Interviewees by category



8 Jess Britton, Jan Webb et al. 2023. Energy Modelling Across Scales – Workshop Summary. Access here.

The role of local energy planning

Local energy planning (LEP) engages multiple actors in analysing options for long-term decarbonisation of energy systems in a locality, based on robust data and evidence[9] [10]. Two main approaches have emerged in Great Britain, local area energy planning (LAEP) and Local Heat and Energy Efficiency Strategies (LHEES).

LAEP undertakes whole system analysis of building stock energy performance, heating technologies, electrification of transport, energy network potential and constraints (across gas, power and heat), local spatial constraints and opportunities. Modelling explores a range of future scenarios which are used to support development of a costed, prioritised plan to achieve net zero targets. Like LAEP, LHEES are area-based, but focus on building-level analysis for clean heat and energy efficiency options.

In England a range of local and regional authorities have commissioned LAEPs[11] but there is no duty or requirement for them to be prepared. In Wales, the Welsh Government has funded LAEPs for all local authority areas, with publication expected in 2024. The plans are intended to inform a 2025 National Energy Plan for Wales.

In Scotland a new statutory obligation required all local authorities to publish a draft LHEES and delivery plan by the end of 2023. LHEES are supported by a common methodology and data[12], resources for every local authority to test methodologies, and funding for support from technical consultants and public bodies. LHEES are now largely in place, with many local authorities developing five-year delivery plans. A number of Scottish local authorities are also commissioning LAEP-style analysis across energy vectors.

"LHEES is told just to focus on heating but actually we need to look at the wider energy system...we want to look at the whole energy system".

9 Parliamentary Office of Science and Technology. 2023. Local Area Energy Planning: Achieving Net Zero Locally. POSTnote 703. Access here.
10 Centre for Sustainable Energy and Energy Systems Catapult. 2022. Local Area Energy Planning: The Method. Access here.
11 Energy Systems Catapult. 2023. Local Area Energy Planning - The Time and Place is Now. Access here.
12 Scottish Government. 2022. Local Heat and Energy Efficiency Strategies and Delivery Plans: Guidance. Access here.

Consolidate learning to inform prompt action

Learning from development of LHEES in Scotland, LAEPs in Wales, and the LAEPs prepared in England[13] provide a strong evidence base on benefits, barriers and challenges of local energy planning and its relationship with delivery. Recent DNO innovation projects also provide learning on integration of local authority and network operator planning (see for example[14]). The next 6 months therefore is a key opportunity for the Government to consolidate this learning and develop a clear framework for effective local energy planning. This framework needs to be in place from the launch of the Regional Energy Strategic Planners.

Experience demonstrates that **local energy planning plays a central role in building essential relationships and working practices** between local energy system actors. Interactions between DNOs and local authorities are particularly important and processes to share data have been developing rapidly. Industrial, transport and housing sector stakeholders are increasingly involved. Additionally, planning can bring multiple local authority departments together to plan and explore decarbonisation interactions across electricity, heat, mobility, waste and land use.

Lack of a common framework for local energy planning in England is a significant gap and risks the emergence of a two-tier system where areas with plans are in a stronger position to develop energy decarbonisation projects and attract investment.

As the following timeline illustrates[15], multiple reports have already emphasised the benefits of, and need for, coordinated and consistent policy on local energy planning. There are sufficient commonalities in findings to provide a basis for **rapid decision-making on an enduring regime across Great Britain**.

13 Approximately 70 LAEP are in place or in preparation – see Energy Systems Catapult. 2023. Local Area Energy Planning - The Time and Place is Now. Access here.

14 UK Power Networks. 2024. Collaborative Local Energy Optimisation. Access here.
National Grid. 2022. Energy Planning Integrated with Councils (EPIC). Access here.

15 This timeline covers the last 10 years, however organisations such as the UN Environment Programme have advocated for more integrated local systems for heat, power and cooling for much longer, particularly in relation to heat networks, for example in:
United Nations, District Energy for the Energy Transition. Access here.

Figure 2: timeline of key local energy planning documents

2017

- ETI/ESC Smart Systems and Heat Programme and development of LAEP tools and pilots
- ETI (2017) The importance of local energy planning to the decarbonisation of heat
- Scottish Government (2017) *Development of Scotland's Energy Efficiency Programme as a national infrastructure priority*. Proposed local heat strategies and zoning

2018

- Energy Systems Catapult (2018) *Local Area Energy Planning: Insights from three pilot local areas*
- Energy Systems Catapult (2018) *Local Area Energy Planning: Supporting clean growth and low carbon transition*
- Energy Systems Catapult (2018) *Local Area Energy Planning: Guidance for local authorities and energy providers*

2019

- Cowell, R. and Webb, J. (2019) 'Local Area Energy Planning – A Scoping Study Final Report'

2020

- Centre for Sustainable Energy and Energy Systems Catapult (2020) *Local Area Energy Planning: The Method*

2021

- Welsh Government (2021) Renewable Energy Deep Dive. Recommends establishing and scaling up local energy plans to create a national energy plan
- Welsh Government (2021) Net Zero Wales strategy. Commits to all areas of Wales having a local energy plan by the end of 2023–24
- UK100 (2021) *Power Shift: Research into Local Authority powers relating to climate action*. Advocated for a national framework for local area energy planning (LAEP)
- Energy Systems Catapult (2021) *The future of local area energy planning in the UK*
- Citizens Advice (2021) 'Look before you LAEP: Ending the postcode lottery of local'. Lack of a national framework risk further exacerbating inequalities across the country

2022

- Energy Systems Catapult (2022) *Guidance on Creating a Local Area Energy Plan*
- CCC published '2022 Progress Report to Parliament'. Recommendation to government in support of Local Area Energy Planning
- Energy Systems Catapult (2022) *Building a governance framework for coordinated Local Area Energy Planning*
- Scottish Government (2022) *Local Heat and Energy Efficiency Strategy (LHEES) pilot programme: synthesis evaluation*
- Scottish Government (2022) *LHEES and Delivery Plans: Guidance*
- Scottish Government Statutory Instruments (2022) *The Local Heat and Energy Efficiency Strategies (Scotland) Order*
- UK Climate Change Committee (2022) *Local Authorities and the Sixth Carbon Budget*. Identified a need to integrate spatial and energy planning

2023

- UK Parliamentary Office for Science and Technology (2023) *Local area energy planning: achieving net zero locally*. POSTnote 703
- Regen (2023) *Planning the regional energy system to support local delivery of net zero*
- Regen (2023) *Planning for energy decarbonisation at a local level: Stakeholder feedback and next steps*
- Citizens Advice (2023) Close to home: How to engage local communities in the development of Local Area Energy Plans
- Energy Systems Catapult (2023) *Local Area Energy Planning: The Time and Place is Now*
- Chris Skidmore MP (2023) *Mission Zero. Independent Review of Net Zero* Reform of the local planning system should give guidance on LAEP
- Skidmore, C. and Houchen, B. (2023) *The future is local. The Local Mission Zero Network Report*. Fund every LA to develop their own LAEP and establish a LAEP governance framework
  - Ofgem (2023) consultation 'Future of local energy institutions and governance' highlighting the role of LAEP
  - Ofgem (2023) decision to develop RESPs to coordinate strategic energy planning at a sub-national level

Consistent framework, data and tools

"Government needs to come up with a standardised process for LAEPs. They need to bring that data into one core portal."

Scottish and Welsh experience demonstrates the importance of clear roles and responsibilities in driving consistent energy planning. **A framework for consistent local energy planning should be developed in England.**

Our research indicates that while stakeholders disagree about some issues, such as the level of granularity required in energy plans, there is strong consensus on the core elements of successful plans. They require:

- **a clear mandate or requirement to act**
- **a structured basis for collaboration**
- **sufficient available, accurate and timely data**
- **useability through geo-spatial mapping and clear interactions with network planning and investment.**

Guidance already exists on the overall process of conducting local energy planning[16]. However, currently LAEPs tend to be delivered by consultants using proprietary modelling tools to prepare decarbonisation scenarios. Whilst stakeholders value this technical expertise, the lack of accessible tools, and limited technical skills in local authorities, were perceived as resulting in 'black boxed' plans that lacked scope for local authorities to interrogate assumptions and optioneer solutions. This risks plans being 'left on the shelf' rather than used as live documents to inform delivery.

Instead local energy planning should be approached as **a process not an outcome.** This emphasises the development of accessible modelling tools and standardised data to allow local authorities to test and refine plans over time. This is likely to be a more efficient use of resources than producing one-off plans. The approach in Scotland of developing centralised tools, methodologies and datasets to inform LHEES provides a good example of combining clear roles with standardised protocols.

"Key take-homes from LHEES in Scotland is that without a legal duty to do so and without an agreement on multi-year funding, nothing is going to happen."

Standardised datasets and access protocols

"[Government] should curate these datasets so local authorities can integrate them into spatial planning."

"The black box document is not really worth the paper it's written on without that information [the data]".

Development of a standardised data formats and exchange processes would streamline access, reduce the cost to prepare individual plans and improve consistency. Local authorities and consultants currently spend a huge amount of time accessing and curating data sets to support planning. Non-domestic data is particularly poor.

16 Energy Systems Catapult. 2022. Guidance on Creating a Local Area Energy Plan. Access here.

Data exchange arrangements between local authorities and DNOs have improved rapidly over recent months, however, data formats and access are still variable across the country.

Standardising data formats and flows, with centralisation of core data sets, would reduce duplication of effort across the country and improve confidence in data quality. The RESPs are likely to be well suited to fulfilling this role. They could provide guidance on sufficiency of data, prioritise access to data that will have the most impact in planning, and take action on areas of data uncertainty. This would support local areas to rapidly develop plans based on 'best available' data rather than delaying action whilst trying to access better and better data sources.

The coordination of data arrangements by the ESO, via the RESPs, would also provide a route for local actors to report challenges around the accessibility or quality of national datasets, as well as providing a forum to explore more rapid data exchange. There is a significant time lag in the availability of some datasets, making ongoing monitoring challenging. The development of dynamic data exchange APIs would be beneficial, current processes often rely on static PDF or excel data formats which quickly become out of date or risk different data versions being used by different organisations. This could also integrate with ongoing ESO/DSO work to improve distributed energy resource visibility[17].

"[DNO] they've come on massively, leaps and bounds, with the data".

"They're essentially very expensive PDFs".

"They're too static, they're far too expensive."

Access to modelling tools for local authorities

"A software tool that we can operate, that we can get insights from, that we can start to be able to have those informed conversations is a more useful place for us to be than fully out-sourced skillsets."

A range of estimates of the cost of local energy planning exist. Scottish and Welsh Governments have information on the cost to deliver support to all local authorities in their jurisdictions. In addition the Energy Systems Catapult has indicated that funding full LAEPs across England would cost approximately £40million[18]. Analysis by Regen suggests that while plans need to be spatial and whole system, they could be developed in less granular detail for approximately £10million[19]. However local authorities suggested that LAEPs are already relatively top-down and plans were often not sufficiently granular to inform building level decarbonisation. Several areas are trialling more adaptable and dynamic tools which could provide considerable learning (for example, work conducted by NGED, WMCA and Advanced Infrastructure[20]).

Overall, modelling capabilities to underpin local energy planning are well established with multiple organisations offering energy baselining and scenario planning services. Current reliance on consultant plans can however limit usability for local authorities as they are unable to interrogate assumptions or refine scenarios as knowledge improves.

17 Such as: National Grid. 2024. Coordinated Operational Methodology for Managing and Accessing Network Distributed Energy Resources (COMMANDER). Access here.
18 Energy Systems Catapult. 2023. Local Area Energy Planning - The Time and Place is Now. Access here.
19 Regen. 2023. Planning for Decarbonisation at a Local Level. Access here.
20 Advanced Infrastructure. 2023. National Grid Net Zero Consortium Progresses to Next Phase in West Midlands Decarbonisation Project. Access here.

Our research indicates considerable support for common modelling platforms rather than funding one-off plans. A review of existing approaches should therefore be carried out as a priority. This should compare the costs, benefits and challenges of funding LAEPs at different levels of granularity. Development of a core modelling platform would give local authorities access to geo-spatial mapping and scenario tools on an ongoing basis.

Again the RESPs could play an important role in the development and curation of these resources, as well integrating them into decision-making and trade-offs between local, regional and whole system scales. Local authorities do not have large technical energy analysis teams, and the RESPs can provide detailed technical expertise to articulate data needs and priorities.

"[LAEP] is a very top-down technical analysis and doesn't have much in the way of local knowledge."

"They have got a lot of assumptions and it's very hard to find out what those assumptions are".

Plans are not yet used effectively as a tool for community and householder engagement

"When it comes to actual delivery of the local area energy plans, the regional energy strategy, nothing is going to happen unless we bring people with us."

Energy system decarbonisation will increasingly involve changes to our homes, streets and neighbourhoods; requiring the involvement and consent of citizens and communities. Lack of engagement can result in low legitimacy and stalled delivery, and to date efforts to involve people have been insufficient[21].

Participation of key energy system stakeholders, including DNOs, local industry, social housing providers and other public sector organisations, is central to LAEP and LHEES. The participation of communities and households is however limited. In Scotland LHEES are subject to public consultation, often after draft plans were published rather than in development.

In England and Wales public engagement or participation in LAEP has been limited. Some areas, such as Oldham – working with Carbon Co-op – have experimented in community-led planning[22], but this is a rarity; community engagement in modelling and planning is resource intensive and often not prioritised. Some DNOs and local authorities are engaging with communities, such as via DNO community energy engineers, but a consistent approach is lacking.

Local energy planning is often seen as too technical to engage citizens, but leaving engagement and public deliberation until developments are underway risks people perceiving plans as being done 'to them' not 'with them'. **More work should explore methods for engaging communities in local energy planning, prioritisation and subsequent project delivery.** Lessons from citizen participation in energy planning could also inform wider infrastructure planning by the independent National Energy System Operator (NESO), as part of the Strategic Spatial Energy Plan (SSEP) and the RESPs, and the new UK Clean Energy Taskforce.

"There's no public engagement, really, in the LAEP process."

"There was nowhere near as much consumer engagement as there should have been."

"Consumer engagement is kind of an add-on, it's not where the focus is."

21 Centre for Climate Change and Social Transformations. 2023. How Can Politicians Avoid a Net Zero Backlash? Access here.

22 Carbon Co-op. 2022. Energy Futures Toolkit Access here.

Focus support on translating plans into delivery and clear investment strategies

"Delivery is going to be a much bigger resource challenge than development of the plans".

LAEP and LHEES provide good evidence to support local investment programmes, but translating plans into viable projects is critical and requires additional support. Many localities are using local energy plans as a basis to prioritise and develop project pipelines and, in some cases, to prepare prospectuses to mobilise private sector investment.

The development of investment plans and prospectuses is often led by combined authorities, with many local authorities reporting limited capacity to engage in detailed project development. More standardised and consistent local energy planning data and tools will support more rapid translation of plans into delivery, but existing agencies such as the Net Zero Hubs in England, Local Partnerships Wales or Heat and Energy Efficiency Scotland can play an important role in project development. Additionally learning from Government and Innovate UK funding[23] to explore local barriers to delivery should be consolidated and used to rapidly reform local powers and responsibilities.

23 UKRI. 2023. Innovate UK Invests Over £25m in Net Zero Projects. Access here.
UK Government. 2024. Local Net Zero: Central Support for Local Authorities and Communities. Access here.

DNO and local authority-led approaches to energy planning should be aligned, with the status of plans formalised in network investment.

Access to distribution network connections and capacity is a key factor shaping the deliverability of many priorities in local energy plans. DNO and local authority relationships on local energy planning have evolved rapidly. Many DNOs are funding staff and providing data portals to support local areas in energy planning; these processes should now be standardised.

DNOs and GDNs carry out comprehensive planning exercises but would these benefit from access to consistent, detailed information at local authority level. Use of LAEPs in DNO business planning is being trialled in three DNOs via Ofgem network innovation funding, but is in its early stages. Whilst DNOs are transforming towards more active network management, flexibility platforms and faster connections, more work is required to establish how local energy plans can best provide certainty for strategic network investment.

There is also a need for **stronger links between local plans, DNO distribution future energy scenarios (DFES) and ESO Future Energy Scenarios**[24] **(FES)**. There is strong interaction between the FES and DFES but interactions at a more local level are variable. Development of the Regional Energy Strategic Planners is important to structuring these interactions and providing a feedback loop between local whole system energy plans and planning at other scales.

"The local area energy plan is a fantastic bit of evidence. It's potentially a very high-level business case."

"The [investment] prospectus was based on the information in the local area energy plan, basically. So we're setting out our store using the information from the LAEP."

"I think a misconception emerged around LAEPs and LHEES, that they would give you a flood of projects...in practice it leads to the starting points of being able to identify projects."

24 And the NESO and SSEP in future.

Time to act

There is now at least ten years of evidence on the role and benefits of local energy planning. A varied landscape exists across GB and studies consistently highlight the need to create a standardised process and clear governance framework, as outlined in Figure 2. The development of Regional Energy Strategic Planners represents an opportunity to both formalise and streamline local planning, ensuring integrated analysis across vectors and scales, and greater democratic accountability.

Development of a framework for local energy planning should, however, go beyond the tools and data. Plans are meaningless if they don't lead to delivery. This involves developing better processes to engage communities in the process and outputs of energy planning. Action to support local planning should also be cognisant of the limited resources available to many local authorities. Commitments from the new government to simplifying the funding landscape for local authorities are welcome but localities also need access to technical skills and project development support.

Considerable learning already exists on how to do local energy planning well, and a relatively modest investment in tools, processes and capabilities is likely to play an important role in unleashing local action. It's time to act.

Authors

Jess Britton, UKERC, University of Edinburgh
Jan Webb, UKERC, University of Edinburgh

This briefing should be cited as: Britton, J. and Webb, J. 2024. Planning Works: Local Energy Planning to Accelerate Net Zero. London: UK Energy Research Centre.

DOI: https://doi.org/10.5286/UKERC.EDC.000977

Photo credits: Unsplash – Ben Wicks, Annie Spratt, William Hook, Carl Jorgensen; Pexels – ThisIsEngineering and Freepik

About UKERC

The UK Energy Research Centre (UKERC) carries out world-class, interdisciplinary research into sustainable future energy systems. Our whole systems research informs UK policy development and research strategy.

UKERC is committed to making all of its publications accessible. If you find any problems with the acceptability of this report or would like further assistance, please get in touch.

UKERC is funded by the UK Research and Innovation, Energy Programme.

UK Research and Innovation

Contact

Email: UKERC@ucl.ac.uk
Website: www.ukerc.ac.uk
@UKERCHQ
www.linkedin.com/company/uk-energy-research-centre

UK Energy Research Centre,
Central House, BSEER,
14 Upper Woburn Place,
London, WC1H 0NN
T +44 (0)20 3108 7564
@UKERCHQ