



Electricity System Operator
Local Energy Network Planning Study

Public First Report for the Electricity System Operator
November 2023



Report for the Electricity System Operator (ESO) on: Local Energy Network Planning

November 2023

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Executive Summary


Great Britain's decarbonisation targets are fast approaching as are the socio-economic benefits they can bring to every corner of these Islands. To successfully deliver on these ambitions, an unprecedented level of infrastructure build is required alongside the deployment of low-carbon technologies and renewable generation so that communities and businesses across the country can make use of this cleaner, cheaper energy.

In preparation for these changes, it is more crucial than ever to make sure the right governance structures are in place to enable both national and local energy transitions to be efficient, coherent, and reflective of the communities in which they will take place.

Well-coordinated, whole-system strategic planning with clear accountability for decision-making can speed up the delivery of local transitions across the country, at the same time as delivering savings by making the most of available resources and technologies. When local and national energy networks are planned well, they can unlock local economies by creating new jobs and new sectors. Most crucially, a whole-system strategic approach to network planning at all levels can ensure communities are engaged with and can benefit from these energy transitions across the country.

Acknowledging the importance of this, Ofgem is conducting a consultation into the future of local network planning governance frameworks. As part of the consultation, Ofgem is proposing the introduction of a Regional System Planning (RSP) body, an overarching strategic body responsible for undertaking regional system planning activities and ensure it is coordinated across vectors and with the right level of local input into the process.

Given the significance of this proposed reform, ESO have commissioned Public First to conduct an extensive programme of engagement with representatives from institutions involved in the local network planning to understand how the system works for stakeholders today, where it is successful and where there are gaps. Through the course of our engagement, Public First found that there was broad




agreement over some areas in the system that reform would be best placed to address. The gaps were:

- 1) A lack of formal coordination between Local Authorities and Network Companies' planning processes.
- 2) Regional disparities can undermine efficiency of some investment.
- 3) A lack of cross-vector planning.
- 4) Understanding and knowledge of councils about the communities they serve was not always considered in the network planning process.

It is important to note that, whilst there was broad agreement on the gaps in the current system, there were mixed views amongst industry and other key stakeholders on what institutions or reforms were best places to address those gaps.

Stakeholders were eager to point out that all institutions currently involved in the process have made large strides in the past decade. However, it was clear that institutions were being to a certain extent held back by governance processes that were at times unclear and disjointed. With an improved governance structure, stakeholders were confident that better practices could be facilitated, and existing actors supported to achieve their objectives to the benefit of communities, local government and industry more widely. Stakeholders believed that any effort to reform the local network planning system should adhere to the following principles:

- 1) Reform should build on not duplicate existing best practice.
- 2) Reform should provide strategic oversight for institutions regionally and nationally.
- 3) Reform should build on existing relationships and facilitate new relationships where possible.
- 4) Reform should bring a whole-systems, cross-vector view to regional network planning.
- 5) Reform should ensure network planning takes account of local ambitions.
- 6) Reform should act as a bridge between regional and national planning.



Stakeholders interviewed for this research believed that reforms to local network planning, including through the introduction of the RSP, will be effective if it can adhere to these principles. Stakeholders were confident that there could be genuine and practical benefits for local communities and the country more widely. Examples of these benefits are outlined below:

- More efficient and faster electrification of businesses across the country, leading to more jobs and regional economic growth. A well-planned network and improved grid connection access can lead to local businesses being able to electrify and get the power they need faster and more efficiently.
- Facilitation of more anticipatory investment and 'least regrets' decision making through supporting the business cases for gas and distribution networks.
- More communities being able to directly benefit from this energy and associated network through quicker installations of EV charging points and rooftop solar panels. A network plan that can identify where capacity exists can speed up the delivery of new everyday technology.
- The potential for cleaner air quality across the country, leading to safer, happier communities. The ESO recently published a holistic electricity network design connecting offshore wind to where it was needed, they estimated it would reduce cumulative CO2 emissions from gas powered generation between 2030 and 2032 by 2 million tonnes of CO2 – equivalent to grounding all UK domestic flights for a year.
- More coordinated and well-planned delivery of key local infrastructure projects: better whole systems network planning could mean housing developments or data centres could more acquire grid connections faster.
- More consideration of energy markets, flexible demand, and other non-network build solutions to manage network constraints which will lessen the cost to the consumer, impact on environment and local communities and improve the deliverability of network upgrades.

Although there are clearly outstanding questions in the design (outlined in this report's conclusion), reform to local network planning presents significant opportunities for communities, local authorities and network companies alike. The ESO would like to thank all those who gave their time to the project. This report would not have been possible without the contribution of those industry and local government representatives who took part in this research.



Introduction

The path to net zero and the opportunities this brings is often seen strictly through a national or even global lens. This is how targets are set and how plans are created, operationalised and funded. The Electricity System Operator (ESO) for instance is working towards operating a zero-carbon power system by 2035. This means working with Government and the energy industry to phase out fossil fuel energy generation (such as coal and unabated gas), enabling renewable low-carbon energy to connect into the electricity grid and ensuring businesses and communities can make use of this cleaner, cheaper energy.

Given the scale of the task ahead, national and international ambitions are needed. But to be effective, they must also be understood and translated into local action. Every town, street and home across the UK will need not only be a part of this energy transition but see the material benefits of it.


At every level we will need to collectively adapt our everyday tasks. We will need to change the way we power our vehicles and heat our homes; adapt our businesses to tap into new emerging technologies and economies; we will need more community energy sources and decentralised generation; and we will need smarter and more flexible technologies to let us take advantage of shifting daily energy costs.

This needn't be a challenge, but an opportunity that all communities, councils and businesses should be able to benefit from.

All of this requires us to think hard about the way the energy system is planned and operated on a regional as well as national basis, and crucially how these systems need to evolve and tie in with one another more effectively. The system will need significant investment; targeted and engaged at all levels to give the best possible results and value for money for consumers.

To deliver the unprecedented level of infrastructure building required and ensuring local businesses and communities can make use of this infrastructure, it is crucial to make sure the system is in place to make this efficient and coherent as possible.

The complexity that will be introduced into both national and local energy systems as a result of this evolution will require greater coordination across a patchwork of local and national institutions, both private and public, with local councils, GDNs



and Distribution Network Operators remaining at the heart of local energy planning


Well-coordinated, whole-system strategic planning with clear accountability for decision-making can speed up the local and national transition across the country, at the same time as delivering savings by making the most of available resources and technologies.

Acknowledging these challenges and opportunities, Ofgem recently launched a consultation proposing reform to the governance frameworks for local network planning. They suggested that accountability for regional system planning activities and for coordinating input from key actors should sit with a single body, called a Regional System Planner.

This report summarises the findings of the ESO's deep dive with stakeholders into the current system of local energy network planning. It is reflective of an extensive programme of engagement with stakeholders involved in local network planning; 20 depth interviews with stakeholders from across the local and national energy systems in the UK, as well as three separate roundtables with local government and industry stakeholders. Input from respondents is anonymised and non-attributable. The briefing follows this structure:

- **How Local Energy Network Planning Works Today:** a summary of the status quo with reference to different actors' roles in local energy planning.
- **Summary of Ofgem's Proposed Regional System Planning Model:** an overview of Ofgem's consultation on reform to local energy institutions and governance and their proposed RSP model.
- **Local Network Planning: Identifying the Gaps:** an overview of the central themes derived from ESO's engagement with experts involved in the planning of local networks.
- **Local Network Planning: How Reforms could fill those Gaps:** an overview of the key ways through which reform to local network planning could fill those gaps derived from ESO's engagement with experts involved in the planning of local networks.

Taking a whole system view, considering the perspectives from an array of stakeholders involved in local energy planning, this report will examine how local



network planning works today and how, in practice, proposed changes to local network planning can most benefit industry, local government and ultimately consumers.



Local Network Planning – Across Different Actors


At present, local network planning is largely carried out by the Gas Distribution Networks (GDNs) and Distribution Network Operators (DNOs) with local energy planning more broadly being planned by councils, mayors, and central governments. All plans are shaped and delivered differently across Great Britain depending on each organisations priorities and resources.

GDNs and DNOs develop single energy vector plans using regional scenario projections that are informed by and inform the national Future Energy Scenarios (FES), created by the ESO. In the case of the DNOs these regional scenario projections are known as the Distribution Future Energy Scenarios (DFES).

DFES are yearly projections undertaken by DNOs and include a variety of granular scenarios that are used at the local level to plan the electricity distribution networks. These projections are used to inform network company business plans that are submitted to Ofgem for approval for each price control period (5-8 years). Company plans are approved by Ofgem, setting the budget allowances for capital and operating expenditure, and the allowed return on the network's regulated asset base.

Whilst the DFES process requires companies to engage with local stakeholders and gather information from a variety of community groups, there is a disparity in the degree of local context that is factored into the eventual business planning process feeding into the price controls. This being the case, the ED2 price controls have addressed this disparity and DNOs have made significant enhancements to their local engagement and have been making progress in the focus on local authority to network interfaces. In their RSP proposals, Ofgem acknowledge the need for a further step change to inform the ED3 review period commencing in 2028.

DFES also serve as a vital resource to inform other plans such as local authorities' Local Area Energy Plans (LAEPs), Local Heat and Energy Efficiency Strategies (LHEES) in Scotland, and Climate Action Plans (CAPs), as well as serve as a vital resource for the national FES and network planning processes more broadly. Whilst the DFES process gives a forecast of many possible growth scenarios, the challenge is then



choosing a central scenario for a business plan or an LAEP, noting that the DNOs define what the best view scenario is in a planning context, compared to other DFES scenarios.

The differences between each actor's role in local network planning is outlined in more detail below:

Councils

Local Councils are at the forefront of creating and implementing local energy plans. They are tasked with incorporating the perspectives and needs of local communities, ensuring that energy initiatives align with local interests. Local authorities will use the information, which is crucial for forecasting changes in energy demand, when engaging with DNOs and GDNs on a regional basis as they plan the future of the networks. At the same time, LAs also engage heavily with Transmission Owners and energy generators if proposed generation and/or infrastructure is in their region.

Some have devised LAEPs which serve as crucial tools for local authorities in shaping the future energy landscape. Recent research by Energy Systems Catapult has highlighted that in less than two years, the number of local councils working towards LAEPs has grown from less than 4% to over 16%¹. These plans take into account regional specifics and provide guidelines on achieving energy and carbon reduction targets. In Scotland, the LHEES do much the same, prioritising heat conservation and efficient energy utilization.

The approaches to local energy planning and its implementation differ across the UK, influenced by regional needs, resources, and priorities. Some areas might be more advanced in their planning and execution, while others lag due to challenges like funding or lack of expertise. Councils must work within varying geographical, financial, and political landscapes. Urban councils might focus on smart grid technologies and EV infrastructure, whereas rural councils might prioritize biomass, wind, or small-scale hydro projects.

¹ [New report reveals four-fold increase in local councils pursuing Local Area Energy Plans - Energy Systems Catapult](#)



GDNs

GDNs own and operate the distribution infrastructure that delivers gas to consumers. They are also responsible for maintaining the safety and reliability of this infrastructure, including pipes, meters, and pressure regulating stations.

GDNs also predict future gas demands in much the same way as the DNOs. This allows them to identify potential areas of expansion or upgrade, ensuring the right levels of gas distribution as consumption patterns change, and feed these into the price controls. GDNs consult various stakeholders, from industry to local councils, to gather input that influences their business plans and long-term strategies.

DNOs

DNOs are responsible for the electricity network infrastructure that delivers electricity to households and local businesses. This not only involves maintaining and upgrading the existing networks but also innovating to accommodate emerging technologies like home solar installations and electric vehicle charging stations.

Using tools like the DFES, DNOs can craft a variety of potential futures, helping them anticipate challenges and opportunities such as significant spikes in demand and greater requirements for more network infrastructure in some areas over others. As with the GDNs, this data forms the basis of company business plans that are approved by Ofgem as part of the price controls. Just like GDNs, DNOs have a strong focus on community engagement. They often work closely with local councils, combined authorities, businesses, and other entities to ensure their plans resonate with local needs and ambitions, achieving collaborative solutions in energy planning.

National Energy Network Planning

Underpinning the above, is the overarching direction provided to these actors by the UK and devolved governments. They are responsible for setting energy targets and creating the policy and market mechanisms in order to achieve those targets.



The ESO is responsible for balancing energy supply and demand in real-time as well as overall design of the electricity transmission network. It works closely with government to help ensure we have the network and technologies in place to ensure these targets can be met. ESO does this by working in close collaboration with Great Britain's Transmission Owner companies who put forward network options for the ESO to assess and ultimately design an optimal coordinated network solution from.

It is important to note that the way in which the ESO is developing the network is evolving. The ESO receives, tests and evaluates information provided to them by the Transmission Owners by weighting the following criteria equally; cost to consumers; deliverability and operability; impact on the environment and impact on local communities. Previously the ESO put forward network investment recommendations based on economic assessments alone. This new holistic approach moves away from radial, point to point planning of the electricity network to a coordinated approach.

Moving forward, this new approach needs to happen at regional level as well. Much progress has already been made in this area; increasingly, data driven, whole system, evidence-based approaches are being taken to local network planning, not least with LAEPs and LHEES. These are improving the efficiency of the journey to net zero, and supporting wider community benefits.

This chapter outlines the multitude of actors, data sets, and processes that go into effective local network planning. It is crucial that the relevant parties are given the tools to build upon these successes to ensure that effective communication and planning between councils, GDNs, DNOs, industry and those parties at transmission level happens coherently and consistently as standard in every locality, whilst maintaining the distinct roles and skills these different organisations bring to the energy network planning process.



Summary of Ofgem's Regional System Planner Model


In its consultation, *Future of Local Energy Institutions and Governance*, Ofgem argues that the changing nature of the energy system will mean efficient network planning decisions will need to happen across energy vectors (gas, hydrogen, electricity etc.) at a regional and national level. As a consequence, Ofgem makes clear that actors involved in energy planning must work in tandem - sharing expertise, data, and resources, and ensuring that national targets and local needs are met simultaneously. The consultation emphasises the importance of coordinating national and local network planning and taking a 'whole system' view.

Ofgem notes: "there needs to be clear roles, responsibilities and processes for the active participation and feed-in by other actors with relevant expertise, such as local government bodies." It argues that greater regional governance is required to ensure it is fully cognisant of regional context and supports the realisation of local net zero ambitions. At a national scale, this governance and cross-vector coordination is also required and is why the ESO is transitioning into the Future System Operator, responsible for strategic cross-vector network planning.

Ofgem's consultation also proposes the introduction of a Regional System Planning (RSP) model as a way of meeting these objectives for regional energy system planning. Below is an outline of the key features of the RSP as suggested by Ofgem in its consultation.

What is an RSP?

Ofgem's consultation suggests a whole system, cross-vector approach to regional energy system planning would "reduce risk to investors and consumers by making connection timeframes transparent." Ofgem suggests this process would need to be regionally specific but connected to a national plan:



“The regional energy system planning approach must be coherent and coordinated with national energy system planning (transmission). This coherence is critical to realising efficient, cost effective outcomes”²


The RSPs, in Ofgem’s proposal, would have energy only responsibilities, with an emphasis on their interaction with network operators and the price control, although would engage with local authorities on spatial planning. More broadly, the consultation details the specific roles that RSPs would take on, broken down into four key functions:

- *develop and own a regional energy system plan, with other actors informing and being consulted in relation to their respective planning activities (i.e. network planning and spatial planning, DNOs, GDNs, LAs) and exogenous sources to develop key assumptions that inform system need e.g. EV uptake numbers and expected contribution to peak demand.*
- *Coordinate, facilitate and ensure effective participation between local actors (which ensures a place-based understanding is central to how the regional energy system is planned).*
- *Remain coherent with national and local net zero ambitions and energy security priorities to achieve the most cost effective decarbonisation outcomes, derived from and informing the individual sub-plans made by local actors.*
- *Provide independent technical analysis and advice to support decision making, primarily within price control setting, for example if different vectors’ plans conflict and/or by identifying improvements and opportunities for whole system optimisation.³*

Underpinning this approach is the notion that existing actors remain responsible for planning activities aligned to their existing functions, and of course delivery of their plans. In other words, the RSPs would not cut across existing activities but would improve the system by plugging existing gaps.

² Ofgem, *Future of Local Energy Institutions and Governance*, May 2022 p.4

³ *ibid*



For example, network companies would remain responsible for network planning activities, but these would need to align with the regional energy system plan (by using the same critical planning assumptions). Local or regional government would remain responsible for local area energy planning activities but, again, these would need to align with the key planning assumptions inherent in the RSP plan as well as the national level. In this way, ultimately the actors therefore combine to deliver their respective elements of the RSP's optimised, whole-system plan which considers the trade-offs across vectors.



Identifying the Gaps

In the same consultation, Ofgem suggested that the existing framework of local network planning (and the link between local and national planning) has a number of critical gaps:

- *there are institutional gaps and a lack of accountability in regard to the delivery of certain energy system functions;*
- *that even where there is clear accountability, roles and responsibilities, it is not clear that these are assigned to the institutions best placed to perform them in the future;*
- *that there is insufficient, or ineffective, coordination between actors across the energy system at a sub-national level, and that confusion and regional variance in approaches to delivering functions could delay the transition to net zero.⁴*

According to specialist thinktank, Regen⁵, the 'RIIO-ED2' governance process was not able to qualify the volume of EVs, heat pumps, renewables, or storage that the networks were preparing for, nor how to accommodate some of local authorities' ambitions. The result was a low baseline and a mechanism to 'up' spending if needed.

In our engagement with people with expertise in local network planning, stakeholders identified many of the same challenges as Ofgem⁶ in its consultation, although some additional challenges were identified in our conversations, outlined below.

⁴ Ofgem, *Call for Input*, March 2022

⁵ Regen, *Future of local energy governance?*, March 2023

⁶ Stakeholders consistently relayed concerns about achieving grid connections at a local level. Whilst this is referenced below ESO has also recently consulted on grid connection reform primarily to the transmission system and are taking a range of actions to address these problems now, via a [five point plan](#). Additionally, after extensive engagement with industry, ESO has put forward a plan for a new, agile, future-proofed connections process in this [consultation](#).



1) There is a lack of formal coordination between Local Authorities and Network Companies' planning processes.

There is a disconnect between Local Authority plans including LAEPS and LHEES, as well as more general carbon reduction plans and gas and electricity network companies' business planning processes. This discrepancy (between the planning of the energy network infrastructure and spatial planning) is often cited as a roadblock to decarbonisation. As one specialist policy professional said of the local authority planning:

Having these plans is a good thing. The details of how they are done, how they're delivered, and then the status that they then have are problems... there's a disconnect between what local areas plan to do and the DFES and the business planning that the energy networks do. That's one of the things that holds them back.


This aligns with the experience of an official working to implement a local area energy plan for a Combined Authority in the North of England, who, after praising their LAEP, asked "how do we implement them?" citing the fact that much of the plan is not accounted for in the eventual delivery of investment:

There's priority projects within there. But just taking a piecemeal approach when you've got a whole system plan set out, that doesn't seem a sensible way of doing it.

Another official involved in the network planning of a separate large combined authority raised a similar point about this disconnect:

The [DNOs] have the DFES and local network development plans but we try to map the constraint against growth trajectories associated with housing developments and that kind of thing. And that's a slightly different approach, their documents have quite a positive spin whereas we're trying to really illustrate a complex problem.

Whilst many more stakeholders made the point that both DNO, GDN and LA engagement had improved dramatically since the first distribution network and



gas price control in 2015, there was also agreement that the LA plans, where they did exist, were not sufficiently aligned with the local network planning processes. This highlights a key issue of accountability. A representative from a specialist consultancy who made the point that the existing network planning processes for gas and electricity are essentially separate from the parts of the system which are democratically accountable:

You've got your democratic map, you've got your gas map, you've got your electricity map... and there is a tension that needs to be to be balanced... bottom up democratic accountability... versus a top down "technocrats coming along and telling you this is the answer".


It was clear that this problem of coordination for LAs also applied at the national level. Many council officers pointed out that, as well as the DNOs and GDNs, they needed to engage heavily with the Transmission Owners and also specific energy generators. This complex web was difficult to navigate in the absence of formal coordination.

By more closely linking the LAEPs and (national and regional) network plans, local network planning can become more democratically accountable and cross-vector without losing its capacity to drive the investment in network infrastructure needed for net zero.

2) Regional disparities in resource allocation mean investment is not always optimal.

Inconsistency across regions in the process for local engagement in system planning coupled with a general lack of resources in local authorities mean engagement is between all actors is mixed across the country, leading to inefficiency as well as disrupted investment.

An official from a combined authority made the point that, in places, the planning process works well, and coordination between GDNs, DNOs and local government had been successful in achieving their mutual objectives, but that this was not always the case:



Where you've had groups of local councils together that have thought about energy needs, those have been picked up by the DNO and put into their plans for future investment. Where that hasn't happened, effectively it's the louder voices and the more organised places that have got the investment.

He added that, in his area, this investment came in place of plans for the national interest or strategic need, and indicated it is a feature of insufficient resources due to the fact that certain places are more affluent and have more resources in local governments or have a stronger local industry body.

An elected member representing a community in the North of England made a similar point about the disparity between areas with more resources being prioritised over others that may have more strategic benefit. A representative from a leading technology and innovation centre specialising in local energy planning made the same point in more detail:

The primary barrier is, of course, around capacity at the local level. It's very easy to announce net zero ambitions but it's very difficult to untangle all that into practical realities. Particularly for some of the more rural ones it is quite difficult. Even if you do a local area energy plan there's all sorts of capacity and expertise to then translate that into reality. It just becomes a very heavy doorstop, essentially.

This issue was repeatedly raised in roundtable discussions and interviews. Whilst there have been significant steps forward in some areas of the UK when it comes to local network planning, other areas have not progressed at the same rate - in large part due to resource constraints.

In order for electricity distribution, gas network and local authority plans to be as efficient as possible in the coming years, this resourcing problem needs to be addressed. This is a problem that any reform to local network planning will not immediately resolve, although it could be made less severe if the processes for local authorities to engage in local network planning are made clearer, easier and less resource intensive.



3) A lack of cross-vector planning means investment can lead to misallocated resources.

Across industry and local government, there was agreement over the need for planning to account for multiple vectors. A representative from a large mayoral combined authority said the following:

Energy is about a lot more than electricity and will become more so. The importance of doing things in a cross vector way and not just doing electricity will increase as we move to net zero.


It was clear that this was a concern of the network companies too, and there was broad agreement that Ofgem had identified a clear gap in the local network planning system in its consultation. In our roundtable discussions with industry, many spoke of the need for a new body to take on a convening role, and to take consistent decisions across different areas and different vectors with consistency in the way that this is done. They argued that this alignment was critical for identifying the “low-regret” options which are necessary to reach net zero and the most efficient cost. This was seen as doubly important by those across industry and local government in the context of changing energy demand across Great Britain.

A representative from a large city council faced difficulties coordinating across vectors under the current system:

The reality of planning through how the vectors will change, how we will retire petrol and diesel, because we quite often still leave petrol and diesel retirement out of the assumptions. So we talk about electric vehicles going at a ramp rate, but we don't talk about retiring.

A representative working in community energy agreed with the need for more thinking to be cross-vector in the local planning space:

[There is a] need for strategic planning for the energy system to be holistic cross vector at a significant enough scale that it can kind of dictate bigish



investment projects and of reinforcement of the transmission distribution network.

Stakeholders also pointed out that taking a “whole system” approach would be increasingly important as new technologies become more prevalent, resulting in more complexity and a greater need for coordination. A representative from a specialist think tank said the following when speaking about the governance model of local network planning:

What do you want networks to do? Functions like bringing that whole system multi-vector view, for example, are going to be really important once we make the decision on hydrogen.

Many other stakeholders highlighted the need for the system for local network planning to adapt as newer technologies and requirements enter the system. One official from a combined authority noted that their GDN had found innovative ways of securing funding for investment outside of the price control through issuing a climate bond, and wondered if it could be applied more generally to the distribution networks under a reformed system.

So one thing that I think gas networks have done is tried to do like almost like a “climate bond for their work on hydrogen and trying to kind of almost crowdfund additional funding that helps them to do the required work that would help them to make the grid hydrogen ready for converting to hydrogen. Something that could be done in the electricity distribution kind of space.

In our roundtable, GDN representatives were also eager to point out that there is a lack of coordination to identify those “low-regret” options which are necessary to reach net zero and the most efficient cost. Without a strategic view those decisions which are low- or least regrets are increasingly in danger of being missed. GDN representatives also argued that this was a particular challenge in gas vector due to the lack of industry expertise, stating that gas network analysts are in short supply already.



4) Understanding and knowledge of councils not always taken into account in the network planning process.

Representatives from local government and community energy placed a large emphasis on the need for network planning to take more account of the specificity of each region. It was argued that this would improve community buy-in to new energy projects, if carried out at a granular level. This was cited as true both in terms of community engagement – the idea that councils have a more developed understanding of their local areas than network companies, ESO or national Government – as well as in terms of better data sharing.

Council officers were largely confident they had data that would inform and improve the efficiency of investment decisions and much more to offer in engagement with communities, but that they needed to have more of an input into the process. In our LA roundtable, representatives noted that system planning could at times feel like it was “done to them” as opposed to with them.

Community energy representatives made similar points, citing the need for network planning to take account of more granular detail:

The community energy sector believes that the actual planning model should be bottom up. The transition to zero carbon should be socially and economically just and socially led. That means what is the maximum amount of distributed onshore generation we can get into the system and then what's the minimum amount of top up that we really need to push down from transmission.

It was also acknowledged by some that, whilst bottom-up approaches were important, there is still a role for some strategic planning knitting everything together, provided it takes account of community impact and views. An official from a large, combined authority said the following:

It's unfortunate that there is a narrative around the top down versus the bottom up, or the decentralised versus the local, because there's got to be a mix of the two. And we've got to find that way of doing it because there is a perception that this is still being kind of forced on us.



The difficulty was cited as twofold by one academic:

The data has to inform the decision-making process but where is the data? The LA, DNO, the retailer and generation all have different sets of data, so there is a lack of data to understand how the system works today and therefore it is extremely difficult to make predictions about system need in future.

Others pointed out that, where data is shared, there is democratic consent and accountability.

The current system of local network planning is made up of actors with hugely different roles, all with much to offer. The individuals we engaged with all spoke positively of the other actors in the system, and where criticisms were made these were made with a recognition that inefficiencies were largely the result of the complexity of the institutional landscape, where gaps arise frequently, and new technologies make it difficult for organisations to navigate.

The hypothetical case study below illustrates how some of these gaps may manifest themselves in practice, highlighting the challenges faced by actors in the current energy planning system, demonstrating the need for a more integrated and locally informed approach. It also highlights the ways in which some decisions are being taken without full knowledge of where more generation, grid infrastructure or storage would be the most efficient use of resources.

Of course, there are many cases where network companies engage extensively with LAs but the information they have received has not been reflective of the local landscape due to the LA being underequipped to plan what information they need to feed in to the networks. The disparity in approaches of LAs across the country means there is no single status quo but rather a patchwork of systems with varying degrees of capacity to plan the local grid.



Existing Framework Case Study: A hypothetical local energy system

A hypothetical medium-sized LA in England is looking to transition to a low-carbon economy in line with the UK's statutory net zero target. With an ambitious goal to retrofit 15,000 homes with electric heating systems in the next five years, they aim to facilitate the adoption of 10,000 electric vehicles (EVs) by constructing 500 new EV charging points, while also targeting a 50% increase in local renewable energy generation. These form the core elements of their path to net zero. However, they have encountered hurdles in the current energy planning system, hindering their progress.

- **Information Asymmetry:** In their retrofitting plans, the LA found a disconnect between the information used by the GDNs and DNOs and their own local knowledge. For instance, the LA's granular data suggested high demand for electric heating systems in certain residential areas. However, the GDNs and DNOs' plans, which were based on broader regional trends, didn't anticipate this local demand spike. This could lead to overloaded local grids, causing power disruptions, and EV charging points offering lower voltage, impacting charging speeds and EV uptake.
- **Limited Local Input:** While the LA provided projections of EV adoption rates to inform the DFES, they found their input had minimal impact on the actual planning process. Despite the LA's data suggesting a need for 500 EV charging points, only plans for 300 were incorporated into the DNO's planning. This led to insufficient infrastructure to meet the demand for EV charging, thereby hampering the widespread adoption of EVs in the community and new electrified public transport networks.
- **Lack of Cross-Vector Planning:** The LA faced significant challenges when attempting to coordinate their efforts between electricity and gas vectors. They have 50,000 households in their area, a mix of both gas-heated and electricity-heated residences. They had plans to transition 20,000 gas-heated households to electricity-powered heat pumps, a move that would put a considerable load on the existing electrical grid. Conversely, this change would substantially decrease the demand on the gas distribution network. However, the existing system made it difficult to effectively coordinate between these two vectors. The electricity DNO was primarily focused on their own grid capacity and did not take into account the decreased demand on the gas network. Meanwhile, the GDN, unaware of the proposed shift to electricity-based heating, was planning to expand its gas distribution capacity. This resulted in a lack of synchronisation between the two, leading to wasteful resource allocation.



How Reform Could Fill those Gaps

In our engagement, we also focussed on what sorts of reform stakeholders would like to see to improve both the national and local network planning process and governance. It was clear that the gaps in the current system mean better planning could present significant economic and community benefits moving forward.

At present, it is still unclear what reform will look like exactly, although this research demonstrates that stakeholders across the local energy planning system believe there are principles to which any changes should adhere to, including in the introduction of an RSP. It is important to note however, whilst many agreed on the gaps within the existing system, there was less agreement on the institution(s) best placed to address them.

If reform does adhere to these principles, it will be able to successfully fill the gaps in the current system – and, in turn, deliver significant benefits to the regions across Great Britain as we move towards 2035.


1) Reform should build on not duplicate existing best practice.

Many stakeholders argued that any reform of the local network planning system should not duplicate the system planning or other work that is already happening. There is a clear appetite for reform to support and improve processes, rather than cutting across and repeating them. Council officers believed that reform truly had to provide bottom-up resource and not duplicate the LAEPs.

Similarly, a representative from a think-tank with significant expertise in local energy planning explained the importance of this point:

There are concerns that this is going to duplicate or cannibalise the resource that is currently doing planning and network planning. What we would much rather see is a partnership or collaborative approach where the RSP will work with networks and others that have got that resource in a collaboration, rather than duplicating... because this is an area where resources are absolutely critical.

As Ofgem argues in its consultation, the existing actors plan for their own assets and within their own competencies. For RSPs to be valuable, they have to focus on



providing opportunities for each actor to complement each other. Through ensuring common starting points, facilitating dialogue and creating an independent strategic summary the output of the RSPs would be a key input to the distribution price controls setting process for the justification of system need. As part of this output, the RSP may also need to run its own whole system scenarios or modelling to arrive at the optimised whole system plan.

2) Reform should provide strategic oversight for institutions regionally and nationally.

In our LA roundtable, the point that reform had to bring about efficiencies rather than duplicate work was also raised repeatedly. The council officers found it plausible that an RSP could achieve this by providing strategic oversight and coming up with consistent planning assumptions across vectors (whereby those assumptions would then go through an additional level of scrutiny so as to ensure the whole-system plan is as robust as possible). Both industry and local government were eager for reform not to come in between them both but to improve coordination.

There can be tangible environmental benefits to this. Improved coordination could lead to quicker adoption of EV network infrastructure for example which, in turn, can substantially reduce the number of diesel cars on the road, leading to cleaner air quality and less noise pollution. It could equally facilitate more house building at scale with greater efficiency in the process as well.

It could also make it easier for LAs to situate housing developments in areas optimised for energy efficiency and renewable energy access, or to ensure that storage capacity can more easily facilitate the electricity needs of new and existing developments to ensure that communities are aligned with the wider system goals.



3) Reform should build on existing relationships and facilitate new relationships where possible.

A number of respondents identified the progress network companies have made in their engagement with LAs and community groups. As one representative of a specialist think-tank said:

all of the DNOs have made really marked progress in developing relationships with local government, and with devolved governments as well.

It was clear that many stakeholders across industry agreed and most people we spoke to wanted reform to add to and build on this progress.


Ofgem noted in its consultation that they “recognise progress has been made in both areas and will continue to be driven by the RII0-2 price controls, however [it] considers that such progress cannot overcome the limitations of the current roles and responsibilities.”

Respondents agreed that there is not enough time to implement a completely new system, with important initiatives already being planned for the next price control. As one official from a Combined Authority argued, the positives of the DNO relationship should be built on rather than replaced:

[The DNO] is making great strides on the relationships and the upskilling that's required for this process. And the idea that an RSP might kind of come in and cut away that expertise and experience is a risk we need to make sure we don't fall into really. So we want to make sure it's additive.

There was clear consensus that network companies have many years of valuable experience in detailed system planning and that any reform should streamline the current patchwork approach to regional energy system planning.

Our industry and LA roundtables suggested that an RSP could have specific “additive” functions like sharing the best practice approaches, offering pathways



against which everyone can plan (least or no regret options), and performing a mapping and coordination function.

As well as planning, it was clear to stakeholders that RSPs will struggle to carry out or replace all the engagement that network companies are already doing. Although some stakeholders believed that formalising the process of engagement could help to bring about greater consistency of engagement in areas of the UK where the LA and DNO and GDN relationships are not as established.


4) Reform should bring a whole-systems, cross-vector view to regional network planning.

Taking a whole-systems approach to energy planning involves not just optimising and coordinating energy networks but also considering the role of energy markets, flexible demand and other non-network build solutions to manage network constraints.

The ESO are currently transitioning into this approach at a national level, their upcoming major infrastructure report (referred to as the Transitional Central Strategic Network Plan (tCSNP)) will evaluate GB's network needs against four criteria: cost to the end-consumer, impact on the environment, impact on communities and deliverability. The report will call for greater coordination for whole energy solutions like the use of flexible demand that could help reduce electricity network congestion and unlock new opportunities for flexible demand and electrolysers.

Reforms at a regional level should also take on wider whole systems view and could make it easier for electricity distribution and gas networks to achieve their net zero ambitions. For example, both councils and community energy representatives repeatedly raised the difficulty of acquiring grid connections in achieving regional net zero ambitions – a challenge being experienced by both the distribution and transmission electricity networks.

Whilst there are a multitude of reasons for long connection lead in times for both distribution and transmission level, building the right network, in the right place, is a key underlying factor driving this issue. Therefore, ensuring that all different types of solutions to network constraints can be worked through at a regional level,



could be key to unlocking network capacity and ensuring businesses and communities can more easily connect to the grid.


A regional system planner, with cross-vector knowledge and visibility could help identify areas of the network which are constrained and work through different solutions with all relevant stakeholders. These solutions could be network build out that aligns with council strategic investment decisions and/or incentivisation of flexible demand.

On the industry side, various parties expressed the view that a key role of a regional system planning should be to recommend and set out the funding needs case for other companies (namely distribution networks and gas networks) to take forward and build, including enabling better 'no regrets' decision making. Stakeholders envisaged a scenario whereby reform helps them to get more ambitious and anticipatory investment in the local grid signed off by Ofgem, augmenting the business case for projects that would ordinarily be hard to secure. These sorts of efficiencies can only be found through having a whole system view. In other words, through gathering a clear sense of where it is more cost effective to deliver more network infrastructure versus raising demand or generation. A clear practical benefit of this could, for example, be facilitating better grid connection processes by streamlining processes and defining the most appropriate solution, for example further network investment or incentivisation of flexible demand, to address network challenges.

5) Reform should ensure that local ambitions are accounted for in the network planning process.

A particular concern of local and combined authority representatives as well as those within community energy was that reform would centralise more power within existing institutions rather than increase local input into network planning. One official of a mayoral combined authority made the following point:

The worry is that this will be Whitehall led, and all of our local skills, opportunities, strengths, insights, and work to date with our DNOs, all of these new plans will kind of ride roughshod over them. And it's just going to create more problems, because quite clearly, the [metro mayors] are not



going to lie down and just let this happen. So we're just going to end up in a bit of a squabble.

There was a clear sense that more could be done to reassure LAs that any reform would take account of their expertise and needs, with an acknowledgement of the continued role for overarching strategic planning to complement the local level:

As a regional entity, the RSP should be there in the middle to help bridge that gap between the local you know, top down and bottom up. And, you know, whether that's within the planning the system or even sort of coordinating signals and operating it.


At the same time, industry stakeholders agreed that any reform, and particularly any introduction of cross-vector plans would have to be highly regionally specific, drawing on expertise from the DNOs and GDNs. A specific point was raised by some industry stakeholders regarding the difficulties posed by different voltages in Scotland to England and Wales across transmission and distribution. Our research showed that, whilst there are certainly areas where local input into network company system planning could improve, in large part these relationships work well, and are improving every year.

It was believed to be highly important that any new body taking on regional and local planning responsibilities have credibility – in terms of knowledge and understanding of local areas – with existing institutions involved in local network planning.

6) Reform should act as a bridge between regional and national planning.

Stakeholders were clear that any reform needs to act as a bridge between local and national priorities so that local ambitions are able to filter up to and align with national priorities and plans.

While greater coordination in local network planning could play a pivotal role in ensuring local ambitions and realities are effectively catered for, many local authority representatives pointed out in our roundtables that it would be vital to



consider how any regional plans dovetail with the broader national framework so that they are not out of step with overarching strategies.

Building on this, one of the ESO's primary network planning functions will be the Centralised Strategic Network Plan (CSNP), once it transitions into an independent public body, responsible for strategic network planning across energy vectors. It will also be crucial that the regional plans align with the CSNP ensuring that while local nuances are addressed, they fit within the broader national grid's connectivity design and scalability⁷.

In turn, regional plans will be able to feed into and also take insights from the CSNP, ensuring the integration of regional nuances into the national design. Ultimately, government targets set the overarching direction for the country's energy planning. While reform can fine-tune regional priorities, it is essential that these plans collectively facilitate the nation in reaching or surpassing these targets. For example, while a particular LA region might have abundant wind, another might need to focus on storage or grid resilience. The cumulative effect of these diverse regional efforts should be taken into account as part of the wider framework.


By bridging regional strategies with national goals and planning mechanisms, the energy transition can be made quicker and more efficient across local and national scales. This synthesis ensures that while local ambitions are catered to, they simultaneously contribute constructively to the broader national vision.

What the future of regional system planning could bring communities?

This research found that more coherent and efficient delivery of both regional and national energy network planning is possible, and that this in turn can benefit communities and businesses up and down the country. These benefits range from:

- Faster electrification of businesses across the country, leading to more jobs and regional economic growth. A well-planned network and improved grid connection access can lead to local businesses being able to electrify and get the power they need faster and more efficiently.

⁷ ESO will be publishing a transitional CSNP in the interim period before FSO publishes a complete CSNP.

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- More timely delivery of key infrastructure projects: better whole systems network planning could mean housing developments or data centres more easily acquire grid connections.
 - More communities being able to directly benefit from this new energy through quicker installations of EV charging points and rooftop solar panels. A network plan that can identify where capacity exists can speed up the delivery of new everyday technology.
 - The decarbonisation of the power and other sectors can lead to cleaner air quality. The ESO recently published a holistic electricity network design connecting offshore wind to where it was needed, they estimated it would reduce cumulative CO2 emissions from gas powered generation between 2030 and 2032 by 2 million tonnes of CO2 – equivalent to grounding all UK domestic flights for a year.

Below is a second hypothetical case study, illustrating how local network planning would change if the gaps identified in chapter 4 were to be addressed. It demonstrates the considerable economic and community benefits on offer for local authorities and network companies in a newer system with a more integrated, whole system framework.

In the case study below, reform to local network planning facilitated the LA and Network company plans and helped in overcoming the barriers faced by other actors under the current system. Sticking to the six key principles outlined in this chapter meant that local energy planning was effective, efficient, and in alignment with regional and national goals. Ultimately, the case study demonstrates how a new approach can build confidence and more easily enable long-term strategic investments, ultimately driving progress towards the 2035 across Great Britain.



Reformed governance framework: A cross-vector case study

The above principles for reform to local network planning draw together and distil the key concerns and questions of both industry and local authorities. To illustrate how these might work in practice, below we apply the principles to the system planning across all network operators and councils in the same hypothetical medium-sized local authority in Northern England:

- **Enhanced Information Symmetry:** With a more joined up local network planning framework, the LA found that their plans to retrofit 15,000 homes with electric heating systems were more directly considered. The DNO ensures that detailed data concerning the electric heating systems are integrated into the regional plan, forecasting the network demands. Concurrently, the GDNs present data regarding hydrogen distribution needs. This leads to a holistic regional plan preventing any possible network overloads or service disruptions. The RSP ensured that the detailed local data was integrated into the regional plan, thereby providing a more accurate forecast for network demands. As a result, sufficient network capacity was planned in the areas of high demand, preventing grid overloads and service disruptions.
- **Increased Local Input:** The RSP's function to coordinate and facilitate participation between local actors meant the LA's goals were central to the planning process. The DNOs and GDNs continue to actively collaborate with the LA. With the LA's projection of needing 500 EV charging points to support the adoption of 10,000 EVs, the RSP ensured these numbers were incorporated into the regional plan. The coordinated effort led to effective planning and implementation of necessary EV infrastructure in a way that was aligned with the LA's ambitions.
- **Improved Cross-Vector Planning:** The RSP's function to align regional plans with national and local net zero ambitions and energy security priorities meant better coordination between different energy vectors. When the LA proposed to power the proposed EV charging points with excess electricity from local renewable sources, the RSP ensured this synergy was integrated into the regional plan using data from GDNs and DNOs. This coordinated planning helped maximise the use of locally generated renewable energy, reduce the LA's reliance on external non-renewable sources, and boost local renewable projects.
- **Independent Technical Analysis:** In cases where there were conflicts between the plans of different vectors, the RSP provided independent technical analysis and advice to all actors in the system. This helped identify the most efficient solutions that would optimise the whole system. For instance, in a situation where the LA's renewable energy targets conflicted with grid capacity, the RSP's technical analysis helped in devising solutions that balanced both the grid capacity and the renewable energy targets.



Conclusion

The ESO's stakeholder research demonstrates that reforms to local network planning, including through the introduction of the RSP, can be effective if it can fill the gaps in the system in the ways outlined in the above chapter. Stakeholders were positive about the opportunities the RSP presented. There were of course questions pertaining to the design and direction of any future RSP which were also raised:

1. **What will be the relationship between LAs and RSPs?** Many believed there should be a clear articulation of the link between RSPs and the local authorities in their region. They wanted to know how the relationship between the two would function in practice and how it would impact the relationship between DNOs, GDNs and LAs, which are largely positive. Many said that, for the relationships to work well, with network companies and LAs, the RSPs would have to establish local credibility in terms of their understanding and knowledge of local communities and areas.
2. **Will accountability and will licence obligations need to change?** Some questioned who the RSP would be accountable to. Moreover, stakeholders were eager to know if the RSP's strategic plan would directly inform Ofgem's price control decisions. Many asked whether the RSP would be responsible for signing off the business plans. Those we spoke to in industry were keen to point out that any formal change in responsibility would have to come with an amendment of their licence obligations.
3. **What will the RSP do in the absence of a clear national strategy?** Most agreed that the RSP would have valuable strategic functions at the local level by aligning spatial planning and energy infrastructure investment plans with cross-vector decisions. However, many raised the point that the RSP would find it hard to make particular decisions about local investment in the absence of clear national guidance or wider policy. For example, how would the RSP determine the use of hydrogen for heating in homes in a particular area if there are no clear guidelines?
4. **What are the implications for funding and resourcing?** There was uncertainty as to how the RSP would help address some of the obstacles that local authorities themselves face. Clearly, the funding of local authorities is not within Ofgem's remit. However, this was a key question for



local government and some asked whether RSPs could provide funding or facilitate sharing of expertise to support local planning initiatives. Various parties expressed the view that RSPs should help to make funding cases and enable better 'no regret' decision making with appropriate lead times.

5. **At what scale will RSPs operate and how will they fit together?** Relatedly, many industry and local authority representatives had questions about the scale the RSP will operate at, whether in line with DNO and GDN boundaries for example, or combined authorities, or at a more granular level of the LAs, relatedly, the question of how to integrate these plans into a single geographic space was cited as a clear challenge.
6. **Will the RSP do any system planning?** The degree to which the RSP would deliver sub-regional plans and engage directly with local stakeholders is still to be determined. The RSP function is likely to work in partnership with networks rather than duplicate or cannibalise their planning and engagement role. Going further, it has been argued that unlocking the full value of networks and enabling them to work in partnership with regional stakeholders requires a new governance model with greater accountability and oversight given to democratically elected local and devolved authorities.

It is vital that any future reform to local network planning continues to take into account the views of the various actors in the system – this will ensure that the right gaps are filled in the best interests of everyone.



Annex A: Research Participants

Highlands and Islands Enterprise
Regen
Energy Systems Catapult
Sustainability First
Community Energy England
Community Energy Wales
Bath and West Community Energy
Scottish Borders Council
Liverpool City Council
Leeds City Council
Oxford County Council
Hammersmith and Fulham Council
Camden Council
Cornwall Council
Cambridgeshire Council
Wiltshire Council
Bristol City Council

Greater London Authority
North East Combined Authority
North Yorkshire Combined Authority
Tees Valley Combined Authority
West of England Combined Authority
West Midlands Combined Authority
West Yorkshire Combined Authority
Local Government Association
UKPN
National Grid Electricity Transmission
SSEN
Northern Powergrid
Cadent
National Gas Transmission
Northern Gas Networks
SGN
Wales and West Utilities