

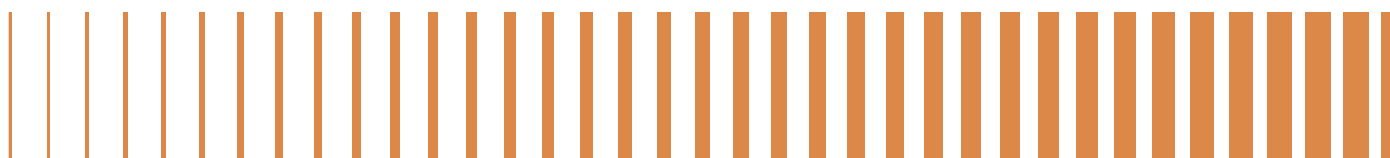
ROUNDTABLE SERIES ON DELIVERING A DECARBONISED ELECTRICITY SYSTEM

Local, regional and national: What interests, opportunities and challenges exist at these levels? How does each contribute to net zero?

Introduction

To achieve the government's target of a decarbonised electricity system by 2035, a whole systems approach is required. In order to inform the government's ongoing work on a delivery plan for a net zero electricity system, the [National Engineering Policy Centre](#) is organising a series of roundtable discussions. The roundtables are convened with senior representatives from industry, academia, and government to discuss crucial systems-level challenges for an effective delivery plan. The intention of the roundtables is to build a greater shared understanding and recognition of the actions and barriers that need to be addressed to implement a net zero electricity system.

This briefing summarises the discussions in the second roundtable, held on Friday 29 September 2023, with the title *Local, regional and national: What interests, opportunities and challenges exist at these levels? How does each contribute to net zero?* The document does not intend to give a complete view of the whole discussion, but rather to summarise key themes. The aim of these discussions was not to reach a consensus on all topics discussed but to contribute to a better shared understanding through gathering key perspectives on important systems-level questions which need to be addressed in the delivery of a fully decarbonised electricity system. Given this and the broad range of stakeholders involved in the discussion, there was no definite consensus on all the topics listed below.



Roundtable 2: **Local, regional and national: What interests, opportunities and challenges exist at these levels? How does each contribute to net zero?**

The focus of the second roundtable was to explore what needs to be planned centrally and what needs to be contributed locally, in a more distributed and decarbonised electricity system. This involved exploring how decision making can be coordinated across different parts of the electricity system, especially given the growing diversity of generation and the emerging role of the Future System Operator (FSO).

The following high-level questions formed the overall focus of the roundtable discussion:

- What parts of the system can and should be planned and coordinated centrally, and what should be delivered locally and/or from the grid edge, or be determined by market participation and development/disruption?
- How are local ambitions and plans translated into action and what is needed to turn plans into projects that deliver local, regional and national outcomes?
- What do we need to know about the data and digital infrastructure to deliver connectivity, communication and understanding across local, regional and national levels in the production of quality outcomes?
- Within the above, how will our understanding and definitions of energy security and resilience need to adapt as transformation progresses?

Key themes of discussion

The broad range of stakeholdersⁱ in the roundtable provided a diverse set of inputs, and several key themes emerged from the discussion.



The role of national, regional and local perspectives

Decarbonisation of the electricity system will not be achieved by following either just a top-down national approach or just a bottom-up local approach. Both are needed to achieve decarbonisation targets and to deliver economic and social benefits for the people and the communities in which they live and work.

Local approaches are required to address the specific characteristics, demographics, needs and opportunities of different areas. National approaches are also needed to ensure that local activities aggregate to and align with shared national targets and interests and deliver on statutory commitments.

National and local efforts and interventions must be effectively coordinated with each informing

the other. In this, there needs to be recognition of the ‘big picture’ of the energy system that provides framing for purpose and direction of change, and acknowledgement of the need to cede authority on this to the entity that ‘owns the big picture’. This seeks to assure coherence, but not stifle or diminish the value and progress that needs to be made at local levels.

Ofgem’s recent decision on the future of local energy institutions and governance (2023) includes the creation of Regional Energy Strategic Planners (RESPs) across Great Britain, who will be responsible for developing strategic energy plans at the regional level and will bring together national targets and scenarios with local and regional insightⁱⁱ. The decision states that the FSO will be the delivery body for this role.¹ The emergence of regional system planning provides a perspective and offers a function that will be helpful in achieving coordination and enabling national and local change. Creation of the RESPs is seen as a positive development but the nature and form of

i All stakeholders are listed at the end of the document.

ii The roundtable was held prior to Ofgem’s decision on the future of local energy institutions and governance which was published on 15 November 2023, so while it was not discussed at the roundtable, much of discussion was in agreement with the later Ofgem decision and the proposal to create the Regional Energy Strategic Planners (RESPs).

the regional role requires further development that should be treated as a key priority.

Arguably there are things that are best undertaken nationally and those that are best undertaken locally. There are also some that are not clear in this regard. There is a risk that regional system planning is taken as the answer to resolving this uncertainty without providing the clarity and detail that is needed.



Dealing with uncertainty

The challenges facing transformation – at national, regional and local levels – can be summarised as complexity, uncertainty and urgency, and importantly, the interactions and trade-offs between these levels.

Uncertainty is particularly challenging and leads to the risk of delay or avoidance of decision making. Uncertainty is reflected most strongly in delivery and delivery planning. There is broad understanding and agreement on what must be done but there is a need to get started. There is a need to make decisions and commit to them and to be clear on who is accountable. This suggests that more is needed to resolve governance questions and to do so across all relevant parties at national, regional and local levels.



Planning and operations

Planning and operations functions should be undertaken at the level most able to make relevant decisions. Parliament, devolved administrations, local authorities and councils all have the authority to develop decarbonisation plans. These will benefit from coordination to help assure alignment of purpose and direction, and from further clarity on both present activities and future needs at local, regional and national levels of the wider energy system, including electricity, heating and transport. Coordination and further clarity can enable effective, efficient and timely delivery of decarbonisation targets.

Local Area Energy Planning (LAEP) is generally seen as a positive step, however a key challenge is the resourcing of local authorities to undertake these.ⁱⁱⁱ There is also the need for these to be affordable for funding-limited authorities and in order to remain current and dynamic. A key question to emerge from the conversation was the potential and need for a regional level of energy planning and the governance arrangements this would require. This is in line with the RESPs recently announced by Ofgem.

LAEP and Local Heat and Energy Efficiency Strategies (LHEES) can play key roles in the decarbonisation of the energy system at the local level, but it is important to understand what degree of authority these have. Coordination is needed across transmission and distribution companies, energy suppliers, and national energy plans for effective delivery.

ⁱⁱⁱ This is a point picked up by others, for example: UK Parliamentary Office for Science and Technology (2023) Local Area Energy Planning² and the recent Mission Zero Coalition report (2023).³



The role of regional systems planning

A whole systems approach is necessary to understand the interdependencies across these systems at the local, regional and national levels. Here is where the recently announced RESPs are expected to play a crucial role in bringing together local and national needs and requirements.

In LAEPs, a crucial aspect lies in understanding the relationship between spatial planning and energy planning. It's important to recognize that while these two are closely linked, they are not identical. If structured appropriately, the RESPs could play a key role in the planning and operation of local energy systems. They can act as independent, impartial coordinating bodies facilitating connections between local and national plans and between energy producers, suppliers and consumers. This can help ensure flexibility in the system.

Regional energy system entities could also help with the operation of a more distributed set of assets. They could help manage demand side flexibility, and enable distributed optimisation and control, which could contribute to system resilience. Distribution Network Operators (DNOs) operate at the intersection of local and national energy plans and therefore have a key role to play in coordinating and collaborating across these levels and in preparing regional energy system plans.

RESPs may also provide better visibility on multiple local plans and developments, which could improve decision making on future system planning and investment for energy infrastructure at both the local and national levels. To help unlock investment, these bodies could be further supported by future systems network regulations that address the interdependencies between the energy system and the electricity system, as well of the dependencies with water, telecoms, transport and other sectors. They could also help provide dispute resolution during conflicts of interests among the various stakeholders in the system.



Systems Operations

It is crucial that systems operations are also addressed as part of the development of regional systems planning. As the electricity system is decarbonised, distributed assets will be increasingly used to balance the system in real time. The same assets can be used for local and national level markets or purposes and so it is important that these markets are coordinated both when the assets are designed and when these are operational. It would be more efficient if the markets across the different local regions are similar in design in order to facilitate the national-local or local-local coordination needed across regions for the use of these distributed assets. This could be achieved by establishing a single body responsible for the market design of distributed assets, such as the FSO.¹ An important enabler for systems operations is digitisation of the system, so that there is a record of where the assets are located and how they can be used.



Investment in innovation will be crucial

Innovation projects are crucial for driving change and achieving net zero policies at national, regional and local levels. Scaling innovation projects requires a coordinated national-local framework that considers governance, project management, skills and financing. Regional energy systems planning can also help coordinate and facilitate investment for local energy plans, by sharing best practice or by facilitating project aggregation for example.



Governance

National and local contributions to the decarbonisation, transformation and future of the electricity system are closely associated with questions of governance and institutional arrangements. The current lack of clarity on local and national governance arrangements is one of the key barriers to delivery planning. There needs to be greater clarity on powers, roles and responsibilities and decision-making authority, as well as democratic accountability.

The current lack of clarity on governance extends to the regional level. The RESPs may function as regional systems architects to support both the planning and operations of a system that meets national and local needs and can help attract the funding and investment needed for delivery, but this function needs to be clarified in the broad governance context. Further clarity on the roles and responsibilities of the new RESPs will be required.

Overall, this roundtable highlighted that clear governance arrangements are lacking but required, and a clear aim should be to support, enable and help coordinate local area energy planning which in turn would support national energy plans, while national energy plans would themselves benefit from a clearer strategy and pathways to the net zero target.

Government has a key role to play in establishing and facilitating connections and coordination across the different institutions that are involved in the electricity system, across local, regional, and national levels. It is important for there to be greater clarity on the functions that are undertaken at the national, regional, and local levels before implementing governance and institutional arrangements to enact these. This will help ensure that when these are established, they are supportive of the 'right' national-local paradigm, rather than dictating it. Clarity on governance arrangements can also help support decision making and collaboration across public and

private institutions to ensure the delivery of local area energy plans.

There are many possible approaches to addressing the governance structure. Currently there is a significant focus on the FSO and its proposed national and regional roles. An alternative approach is to think more about a 'confederation of DNOs' as a way to address interests across national and local needs. A further point was raised asking if there is a need for an enduring, apolitical organisation.



Who owns cross-sector resilience?

There are multiple challenges to maintaining resilience as we move to a more distributed and decarbonised electricity system. Firstly, there are no aligned or shared resilience standards for the various services that we depend on, such as electricity, water, or telecoms. Secondly, resilience should factor in local, regional, national, and global risks. There is a need for a coherent approach towards developing resilience, and for risk management under uncertainty. The system should be able to respond to periods of intermittency at the regional level, as well as extreme weather events such as intense rainfall or very high temperatures, at the local level. In developing approaches to resilience, the networks should also factor in the various interdependencies of the electricity system on other systems such as water, telecoms and, increasingly, transport. This increases the challenge of defining clear responsibilities and accountabilities for developing resilience that address these cross-sector dependencies.

Resilience requires the efforts of all key parties across the system. Currently the proposal is for the FSO to develop plans for resilience, while the DNOs and other networks/systems manage resilience on the ground. A case can be made for local authorities to have key roles in developing resilience, as they will be at the forefront of

climate adaptation efforts and are most closely associated with both the communities that will be affected in extreme situations and the full range of services and amenities which may be affected. Local authorities also have the capacity to coordinate with civil society and to identify vulnerable customers. There would, however, be a need to address a gap between needs and capabilities in relation to this responsibility. Local authorities would therefore benefit from clear guidance on developing resilience, from common resilience standards that are developed nationally, including those that factor in the challenge of interdependent services as well as the various extreme events and risks that can occur from local to national levels.^{iv}



People

There is consensus that people should be at the centre of the energy system and its transformation. This is not just consumers, but citizens more broadly. This must acknowledge the various needs of people and be mindful of not leaving some behind or at a disadvantage. This would also benefit from a strategy on what options could be available to people engaging with decarbonisation and how they could participate in the decision making for the needs and requirements of their local areas. This topic can be explored in much further depth and some aspects of this are the topic of the third roundtable in the series, looking at how consumers can contribute to decarbonisation.



Who is responsible for public engagement?

Engaging with the public on decarbonisation of the electricity system is essential for system transformation. However, this is a challenging task with no clear guidance on who is ultimately responsible for engagement and with barriers to how and when to inform the public. The energy industry is itself complex and not accessible to users, while the rise in energy prices has further eroded public confidence.^v Due to this vacuum, misinformation abounds which can breed further mistrust. Public engagement requires national support and needs to be delivered locally. Some participants saw a greater role for citizens' assemblies and panels within local energy system planning. There is also a role for local initiatives and trusted local partners. Another perspective on engagement is that of suppliers of new technologies (such as electric vehicles) or the tradespeople who will be providing a new heating system; these parties will help develop confidence by providing good practical information and customer care.

^{iv} See, for example, a case study of multiple cascading failures that can occur in the event of a loss of electricity, in this case as a result of Storm Desmond in Lancaster in 2015.⁴

^v Understanding how consumers can be engaged in the energy transition is crucial to enable the effective delivery of the decarbonisation targets. This will be the subject of the third roundtable briefing in the series. See list at the end of the document for a full view of the roundtables in the series.



Data needs

Data collection, governance and sharing is an important issue across geographical scales from local to national. This would benefit from a systems approach, not only within the electricity system but across other interdependent systems such as transport, water and telecoms. Data is not routinely or readily shared and is highly siloed across different institutions, nor is it known what data is needed across organisations for specific relevant functions. For example, for Local Area Energy Planning, it would be hugely beneficial to know what data DNOs need and why in order to support energy networks and business planning. This could help define what data needs to be shared. Real-time control of distributed assets requires digital information flows. Enabling digital information flows and access to data gathered by different institutions is critical for robust analysis and efficient energy management.⁵ Digital information needs to flow among different institutions to enable good decision making. This requires data-sharing infrastructure to be established across the energy system and, ultimately, other related systems as well.

Government and the regulator can help facilitate the connections needed for efficient digital information flows. This in turn highlights the need for effective governance for improved data access but where potential harms can be addressed.

Key messages from the NEPC Working Group on decarbonising the electricity system

The roundtable highlighted some of the key challenges that need to be addressed in decarbonising the GB electricity system by 2035 in a secure and affordable way.

Based on this discussion, the NEPC Working Group on decarbonising the electricity system has identified a number of key messages. While these were informed by the discussion in the roundtable, the conclusions are made independently by the Working Group and do not reflect the opinions of the participants in the roundtable.

■ All perspectives are needed

Transformation of the energy system requires effort and interventions at national, regional and local levels; success will come from all in concert, not one or the other. These must be appropriately coordinated so that they reinforce each other and do not conflict. A regional perspective is emerging that could be helpful in assuring this success, but this requires more formal and effective governance arrangements to be put in place.

■ Local area energy planning

A crucial element for decarbonising the electricity system will be sufficient local planning and assuring coordination across local, regional and national plans. Local area energy planning (LAEP) can play a key role at the local level, but resourcing (both skills and finance) across local authorities remains a challenge.

There is also a need for these plans to be dynamic to ensure they remain current in a fast-changing environment.

■ Regional system planning

There is significant value in having regional system planning which is reflected in the creation of the Regional Energy Strategic Planners (RESPs). However further work is needed to develop understanding of this function, its operation and its relationship with other key stakeholders. Further clarity on their roles and responsibilities is required.

■ Governance

The lack of clarity on governance and institutional arrangements is a key barrier to the delivery of electricity system transformation. A contributing factor is that the functions to be performed are not well articulated. Preparation

and execution of a delivery plan for achieving decarbonisation cannot happen without governance being addressed.

■ **Cross-sector risks and dependencies**

As the electricity system becomes increasingly interconnected with other systems, there is a need to reevaluate the definitions, responsibilities and accountabilities of cross-sector risks and dependencies. This is necessary for ensuring systems resilience and the security of services to people and communities.

■ **Improved and increased public engagement**

Public engagement is a necessary element of decarbonisation at a national scale, but it needs to be delivered locally as well. The current lack of clarity on who is responsible for public engagement for decarbonisation of the energy system needs to be resolved. More national

support for public engagement activities delivered locally should be made available.

■ **Data sharing**

The interaction between local, regional, and national levels in the electricity system as well as the electricity system's interaction with other physical systems requires new means of collecting, governing, and sharing data. A systems approach to data is needed to realise the whole system benefits that are available. This requires an effective 'data-sharing infrastructure'.

■ **Unlocking innovation and investment**

The energy transition cannot happen without innovation at the national, regional and local levels. This requires investment which will flow only when questions of risk and uncertainty are better understood and managed.

Public engagement is a necessary element of decarbonisation at a national scale, but it needs to be delivered locally as well.

Roundtables and briefings in the series

This is roundtable 2 of a series. The full series of roundtables and reports is listed below:

Roundtable 1 **Decisions now for a future system: Making design and construction decisions for the electricity system of 2035 and 2050**

Roundtable 2 **Local, regional and national: What interests, opportunities and challenges exist at these levels? How does each contribute to net zero?**

Roundtable 3 **Consumers, flexibility and efficiency: How can consumption contribute to the decarbonisation of the electricity system?**

Roundtable 4 **Governing transformation, transforming governance: Managing ambiguity, interconnection and digitalisation**

Roundtable 5 **Delivering electricity decarbonisation by 2035: What do we need across industry capacity, procurement and skills?**

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- 5 *Towards trusted data sharing: Guidance and case studies*. (2018). Royal Academy of Engineering. <https://reports.raeng.org.uk/datasharing/>

Members of the NEPC Working Group on decarbonising the electricity system

This roundtable series is being convened by the National Engineering Policy Centre (NEPC).

The working group includes representatives from the Institution of Engineering and Technology (IET), the Energy Institute (EI), the Institution of Mechanical Engineers (IMechE), the Institution of Civil Engineers (ICE), the Permanent Way Institution (PWI), the Royal Academy of Engineering, and the Energy Systems Catapult.

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