

# Regional Energy Strategic Planners

Recommendations from the ENA  
Distribution Network Operator group



01 July 2024

regen   
transforming energy

ena  
energy networks  
association

- Forecasting
- Network planning
- Network investment

# Purpose of this report

The purpose of this report is to provide constructive input to the future design and function of the Regional Energy Strategic Planners (RESPs), focused on the interaction between RESPs and Distribution Network Operators (DNOs).

To develop this report, Regen has worked with the ENA DNO group to understand current DNO network development processes and explore the potential interactions and integration between DNO processes and proposed RESP functions.

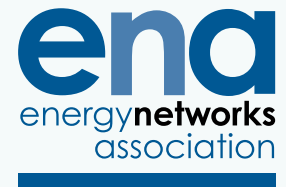
Input from the DNO group has been obtained through interviews, Requests for Information and roundtable discussions. Report recommendations have been compiled by Regen, with review and input from the ENA DNO group members.

While there are a range of views and priorities across GB's DNOs, this report reflects a consensus amongst the DNO group.

The report makes a number of recommendations that would enable the RESPs to efficiently add value to the DNO network development process and wider regional energy planning activities, with suggestions as to how the DNO and RESP work practices could evolve together.

It also identifies functions that should remain within the DNOs' remit to maintain clear accountabilities, avoid duplication of efforts and make best use of existing DNO capabilities and knowledge.

It is hoped that this report will add to the ongoing RESP design development and inform further discussion within the RESP stakeholder group.



- Forecasting
- Network planning
- Network investment

# About Regen

Regen is a centre of energy expertise and market insight whose mission is to transform the energy system for a zero-carbon future.

Preparing our energy infrastructure for net zero is one of Regen's key strategic goals. To meet net zero, significantly more renewable and low carbon technologies will need to connect to the network, which requires moving towards a more strategic, smarter and flexible approach to investing in and managing our energy networks.

Regen is working closely with the energy network companies, the system operator and industry stakeholders to address key network and innovation challenges and providing market-leading future scenario analysis to inform network planning and investment – helping ensure our network infrastructure is ready for net zero.

Alongside this report, we have recently produced two other reports in this area:

- '[Roadmap to RESP](#)', sponsored by SSEN and informed by extensive engagement with regional stakeholders, sets out new thinking on how the new Regional Energy Strategic Planners and evolution of current processes could unlock regional net zero ambitions through regional collaboration, local area energy planning and dynamic stakeholder engagement.
- '[Electrification: The local grid challenge](#)', sponsored by the MCS Foundation, looks at what it will take to ensure the local distribution networks are ready for net zero, including recommendations to the UK government, Ofgem and the DNOs on how this could be achieved.



- Forecasting
- Network planning
- Network investment

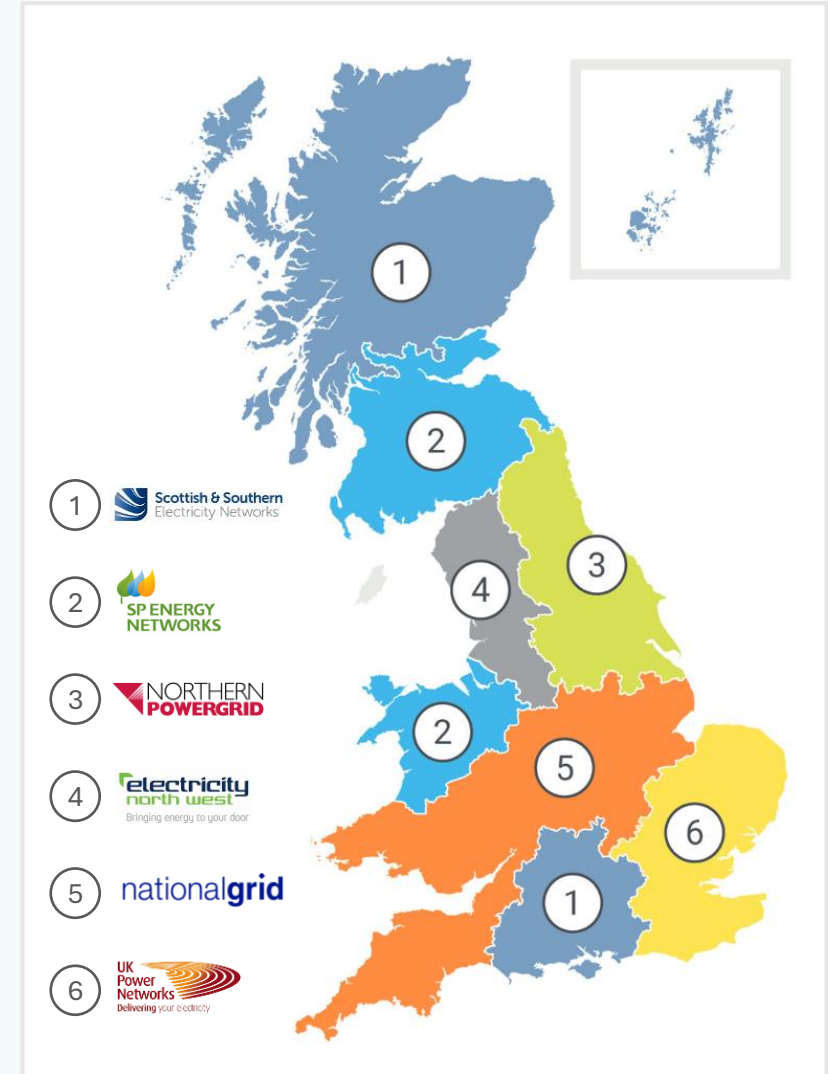
# About the Energy Networks Association

Energy Networks Association represents the companies which operate the electricity wires, gas pipes and energy system in the UK and Ireland. This report has been written alongside GB's Distribution Network Operators (DNOs).

The ENA helps its members meet the challenge of delivering electricity and gas to communities across the UK and Ireland safely, sustainably and reliably. The ENA is *helping* its members to:

- Create smart grids, ensuring our networks are prepared for more renewable generation than ever before, decentralised sources of energy, more electric vehicles and heat pumps. Learn more about our [Open Networks programme](#).
- Create the world's first zero-carbon gas grid, by speeding up the switch from natural gas to hydrogen. Learn more about our [Gas Goes Green programme](#).
- Innovate. The ENA is supporting over £450m of [innovation investment](#) to support customers, connections and more.
- Be safe. The ENA brings the industry together to [improve safety](#) and reduce workforce and public injury.
- Manage our networks. The ENA supports its members manage, create and maintain a vast array of electricity codes, standards and regulations which supports the day-to-day operation of our energy networks.

Together, the energy networks are [keeping your energy flowing](#), supporting our economy through [jobs](#) and investment and [preparing for a net zero future](#).



- Forecasting
- Network planning
- Network investment

# Summary of report key points and recommendations

**1.** DNOs are positive about the role that RESPs could play.

**2.** RESPs could provide technology-neutral whole-system coordination to support key cross-vector challenges.

**3.** The RESPs' stakeholder engagement should build on engagement already undertaken by networks to add value and avoid duplication.

**4.** The outcomes of the RESPs will likely vary depending on regional context.

**5.** Collaboration is critical, but the DNOs must remain responsible for network development.

**6.** It is important that DNOs retain final responsibility for forecasting load growth on network assets.

**7.** The DFES forecasting process could be adapted to incorporate strategic and whole-system energy plans produced by RESPs.

**8.** RESPs could have a role in aiding and improving the standardisation of network planning approaches.

**9.** Providing assurance and advice on certain specific, relevant aspects of DNOs' plans could be a key complementary role for RESPs.

**10.** There must be a clear strategy for RESP roles in RIIO-ED3, with transitional arrangements in place.

- Forecasting
- Network planning
- Network investment

# Abbreviations and acronyms

<b>CBA</b>	Cost-benefit analysis	<b>LAEP</b>	Local Area Energy Planning
<b>CCC</b>	Climate Change Committee	<b>LTDS</b>	Long-Term Development Statement
<b>CSNP</b>	Centralised Strategic Network Plan	<b>LHEES</b>	Local Heat and Energy Efficiency Strategies
<b>DFES</b>	Distribution Future Energy Scenarios	<b>NESO</b>	National Energy System Operator
<b>DNO</b>	Distribution Network Operator	<b>NDP</b>	Network Development Plan
<b>DSO</b>	Distribution System Operator	<b>NGED</b>	National Grid Electricity Distribution
<b>ENA</b>	Energy Networks Association	<b>NPG</b>	Northern Powergrid
<b>ENWL</b>	Electricity North West Limited	<b>RIIO-ED</b>	Electricity distribution price controls
<b>ESA</b>	Electricity Supply Area	<b>SPEN</b>	SP Energy Networks
<b>FES</b>	Future Energy Scenarios	<b>SSEN</b>	Scottish and Southern Electricity Networks
<b>GDN</b>	Gas Distribution Network	<b>SSEP</b>	Strategic Spatial Energy Plan
<b>LA</b>	Local authority	<b>UKPN</b>	UK Power Networks

- Forecasting
- Network planning
- Network investment

# Regional Energy Strategic Planners (RESPs)

Ofgem has proposed to introduce a new regional energy strategic planning function which would sit within the future National Energy System Operator (NESO).

This report aims to inform the design and form of the new RESP function, which is currently in development and subject to detailed design.

It is intended that the initial RESP functions would be in place by 2026; however, it is likely that the RESPs' roles will evolve over time in response to stakeholder and energy system requirements.

## Ofgem has stated that the RESPs will have four key functions:

**1) Strategic planning** to ensure that national targets and plans are aligned with, and informed by, local insights and data to create a regional plan - with a specific focus on whole-system and cross-vector optimisation.

**2) Technical coordination** to ensure consistency, coherence and integration across vectors and across plans to support consensus-based decision-making.

**3) Place-based engagement and coordination** to establish processes for local actors to engage in network development, facilitate engagement and act as a convenor to bring network companies and regional stakeholders together to work towards planning objectives.

**4) Supporting local actors** by providing a proportionate amount of support to local authorities, devolved government and other local actors to assist in developing local plans. Support is, however, likely to be in the form of tools, data and advisory input rather than dedicated resources to develop local plans.



- Forecasting
- Network planning
- Network investment

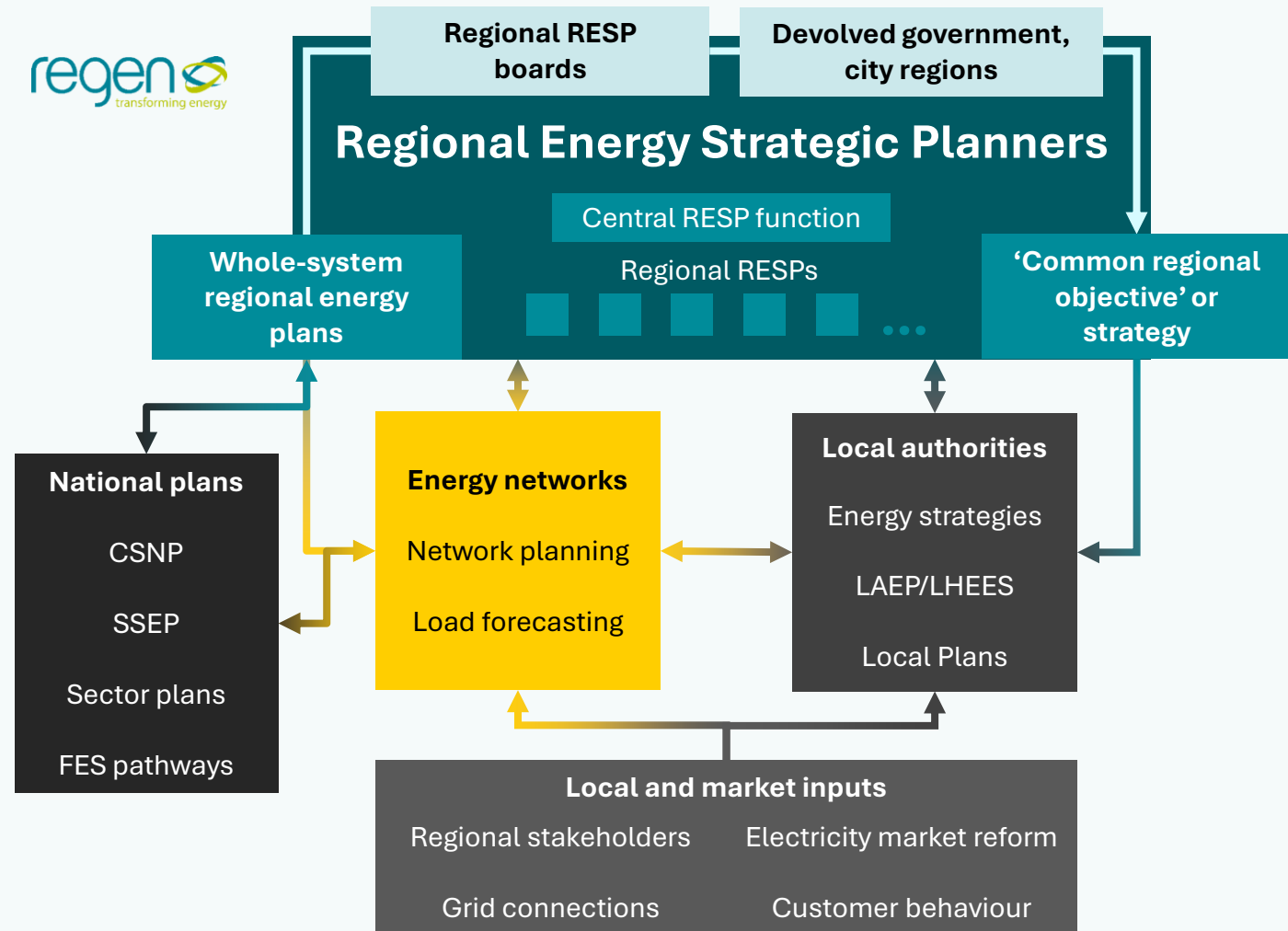
# The landscape of RESPs, energy networks, local authorities, national plans and wider stakeholders

The interaction between future RESPs, energy networks, local authorities, national plans and the wider market is still to be defined and may change as the RESPs are established.

This diagram shows Regen’s current understanding of the RESP landscape, illustrating the anticipated interfaces between key parties once the RESPs have been fully established.

It highlights the key role of the RESPs as a bridge between national and local/regional energy planning.

The complex process of load forecasting – the mapping of loads and load profiles to network assets – continues to sit with the networks.





- Forecasting
- Network planning
- Network investment

# Interactions between RESPs, energy networks, local authorities, national plans and wider stakeholders

The level of detail of RESPs' outputs and plans has not yet been defined and may evolve as the RESPs are established.

Initially, the outputs will likely be in the form of a high-level **whole-system regional energy strategy**. This would detail a key strategic vision and energy objectives for the region. This could evolve into more detailed **whole-system regional energy plans**, detailing pathways for energy demand over time.

RESP outputs could be a primary input to DNO load forecasting. This load forecasting and subsequent network planning should then feed back into the RESPs' plans, creating an iterative, collaborative feedback loop.

## Key inputs

- |   |   |   |
|---|---|---|
| <b>National plans</b> <ul style="list-style-type: none"> <li>- National and devolved government targets</li> <li>- FES pathways</li> <li>- SSEP and CSNP outputs</li> <li>- CCC pathways</li> </ul> | <b>Local plans</b> <ul style="list-style-type: none"> <li>- Local net zero targets, LAEPs and LHEES</li> <li>- DNO and GDN data</li> <li>- Heat zoning, transport</li> <li>- Industrial clusters</li> </ul> | <b>Local and market inputs</b> <ul style="list-style-type: none"> <li>- Regional stakeholders</li> <li>- The wider market: connections and customers</li> </ul> |
|---|---|---|

## RESPs (as per Ofgem's detailed design workshops)

The RESPs' outputs could evolve from a higher-level **whole-system regional energy strategy** (left) to a full **whole-system regional energy plan** with several pathways (right)

<b>Strategy</b> <ul style="list-style-type: none"> <li>High-level regional targets for key technologies, heating, transport, efficiency etc.</li> <li>Provides a clear long-term vision and regional objective</li> <li>Spatial plan allied to SSEP</li> <li>Whole-system analysis, e.g., heat zoning and industrial clusters</li> <li>Reflects devolved government</li> </ul>	<b>Detailed plan</b> <ul style="list-style-type: none"> <li>Year-based regional pathway(s) allied with national pathways and SSEP.</li> <li>Granularity to LA and potentially sub-LA</li> <li>Forecast energy demand across the region over time by demand source</li> <li>Growth projections for low-carbon technologies – e.g. heat, generation, storage</li> <li>How these align with the regional objectives</li> <li>Analysis of heat zones and heat tech</li> <li>Transport energy requirements</li> </ul>
--	--

## DNOs

The regional energy plan would be a primary input to DNO load forecasting

DNO load forecasts and network plans would feed back into the RESP plans

<b>DNO load forecasting (load growth by asset &amp; profile)</b> <ul style="list-style-type: none"> <li>- Load growth forecasts: the <b>growth</b> and <b>location</b> of technologies and demand sources over time</li> <li>- Detailed mapping to <b>network assets (DFES)</b></li> <li>- Load profiling: how customers and technologies operate on a <b>half-hourly</b> basis</li> <li>- Explores a <b>range of future scenarios</b> to ensure network resilience, reliability and safety</li> </ul>	<b>DNO network planning</b> <ul style="list-style-type: none"> <li>- Network constraint analysis</li> <li>- Optioneering solutions</li> <li>- Network investment</li> <li>- Network development plans</li> </ul>
--	--

- Forecasting
- Network planning
- Network investment

# DNOs are positive about the role that RESPs could play

The RESPs could add value by:

- Developing whole-system regional energy plans that reflect regional, local and devolved government priorities
- Ensuring coordination and coherence between regional and national plans
- Working with energy networks to ensure that the network development process reflects regional priorities
- Strengthening engagement between local stakeholders and networks

## Adding value

There are several areas in the current network development process where RESPs could add value.

For example, whole-system questions around the decarbonisation of heat and industrial clusters will benefit from a body that can provide independent analysis across energy vectors, networks, local and national government, and wider regional stakeholders.

Close collaboration between RESPs and energy networks will be vital to producing efficient, coordinated regional energy plans that represent regional ambitions and feed up into national plans.

### Coordination with DNO accountabilities

Energy networks hold a wide range of existing stakeholder relationships, data flows, region-specific knowledge and specialist network development expertise, all of which the RESPs can complement.

Coordination between the RESPs and DNOs will be essential. Duplicating or displacing DNO network development processes would be inefficient and could undermine existing relationships and knowledge. More substantially, this could risk DNOs being unable to effectively discharge their licence conditions and regulatory and statutory obligations (see [Appendix](#)).

- Forecasting
- Network planning
- Network investment

# RESPs could provide technology-neutral whole-system coordination to support key cross-vector challenges

RESPs could add particular value by coordinating between gas and electricity distribution networks concerning the decarbonisation of heat.

In addition, the RESPs' engagement with local stakeholders would have an intrinsically whole-system scope compared to networks, which have a more sector-specific focus.

## Whole-system coordination during stakeholder engagement and requirements planning

The RESPs could provide the most value in areas where there is a need for whole-system or cross-network coordination – such as the development of plans for heat decarbonisation, heat networks or industrial clusters.

In addition, RESPs could also provide value by providing an additional layer of engagement and whole-system thinking to help ensure that DNO network development processes are aligned with both national and regional priorities and strategic plans.

The specific areas where DNOs believe that RESPs could add value are:

- During stakeholder engagement, by increasing whole-system engagement and acting as a convener across networks and wider systems.
- Developing regional strategies and whole-system plans that would provide a primary input into DNO load forecasting and network planning.
- Providing an additional level of review and assurance to proposals for strategic network investment, confirming they are aligned with the whole-system regional energy plan.

- Forecasting
- Network planning
- Network investment

# Examples of cross-vector challenges

## Decarbonisation of heat

The decarbonisation of heat is a significant uncertainty in the UK's pathway to net zero. The RESPs could play a key role in aiding local authorities to produce plans for the decarbonisation of heat, such as through provision or signposting of tools and datasets. These plans can then be reflected in electricity and gas distribution network development.

Following the UK government's expected decision on hydrogen for heating in 2026, clear regional strategies for low-carbon heat would ensure joined-up planning across local authorities, devolved governments, RESPs and energy networks.

## Industrial clusters

Industrial clusters are a key challenge due to their economic presence within a region, in addition to their substantial energy demand across multiple vectors. RESPs could have a highly complementary role in helping to plan the decarbonisation pathway for industrial clusters across various energy networks in the same region.

While different networks have different drivers to reflect in their scenario planning processes, reflecting common assumptions under the same scenarios would be useful. For example, defining which areas of a region have access to networked hydrogen under certain scenarios or aligning assumptions around industrial cluster decarbonisation pathways would enable efficient network development for these clusters.

## Transmission and distribution

Within the electricity system, there is existing whole-system working and coordination across Distribution Network Operator, Electricity System Operator and Transmission Network Operator functions. This is already a key licence condition and expectation of the DNOs (see [Appendix](#)). While the RESPs may play a role in increasing this coordination within a region, it is likely to be a less vital function compared to coordination across multiple energy vectors.



- Forecasting
- Network planning
- Network investment

# The RESPs' stakeholder engagement should build on engagement already undertaken by networks to avoid duplication

DNOs have markedly increased levels of stakeholder engagement in RIIO-ED2.

RESPs could build on existing DNO engagement and add value through a whole-system remit. This would avoid inefficient duplication of engagement and minimise engagement fatigue amongst stakeholders.

Where RESPs instigate new engagement activities, these should be clearly targeted to provide additionality and focus on new opportunities.

## Building on existing engagement

Over the last few years, DNOs have:

- Created dedicated local engagement teams during RIIO-ED2 to increase the level of engagement with local stakeholders.
- Increased the amount of open data and tools available to local stakeholders, especially for local authorities producing LAEPs, LHEES or other local energy plans.

To maximise efficiencies, the RESPs should be brought into these existing stakeholder relationships, alongside the DNOs and local stakeholders. This would add an additional level of strategic, whole-system engagement without replacing established links or making it harder for stakeholders to engage.

Alongside this, the DNOs will have to continue engaging directly with stakeholders on local insight, data sharing and local network requirements (see [Appendix – DSO Baseline expectations](#)).

National Grid LAEP  
support page



SSEN Local Energy Net  
Zero Accelerator



UK Power Networks  
Open Data Portal



SPEN Strategic  
Optimisation



Northern Powergrid  
Open Data Portal



Electricity North West  
Data Portal



- Forecasting
- Network planning
- Network investment

# The outcomes of the RESPs will likely vary depending on regional context

As DNOs have experienced through their own stakeholder engagement, regions have different requirements for interaction, support and coordination.

Regions with devolved governments, or well-resourced combined authorities and city regions, will have different requirements from the RESPs compared to regions and sub-regions composed of individual local authorities or where energy planning resources are limited.

**The RESPs may add value and conduct their four key functions differently depending on existing structures and resources in each region. For example:**

- Scotland and Wales, with devolved governments and high coverage of LAEPs/LHEES, may benefit most from more ‘oversight’ functions based on coordination and signposting. DNOs currently reflect devolved government targets and regional plans in their scenario planning.
- Combined authorities or mayoral areas that are well-resourced may need less direct RESP support but may also be in a better position to engage with the RESPs’ strategic planning.
- Where there isn’t an existing regional energy strategy or governance structure to develop one, the RESPs could support local actors and aid strategic engagement between LAs and energy networks.

In these areas, the RESPs may need to take a more active role in supporting the production of a regional plan and LAEPs, such as providing data and tools and convening stakeholders to produce plans.



- Forecasting
- Network planning
- Network investment

# The outcomes of the RESPs will likely vary depending on regional context

The four key RESP functions should vary depending on the needs of each region. This is likely to evolve as the RESPs are established and local authorities continue to undertake local energy planning.

RESP function	Light and strategic Increasing support and resources →	Deeper support	
<b>Strategic planning</b>	The regional plan is high-level and strategic (in the form of objectives and opportunities) and feeds regional feedback into national plans.	The regional plan is detailed, especially in cross-vector or other priority areas, and is a key interface between national and regional network plans.	The regional plan is detailed to a local level and reflects regional objectives. The plan is a key input for national plans and regional network plans. The RESP may be asked to assure that network plans align with the plan.
<b>Technical coordination</b>	The RESP ensures network development processes are robust and support strategic planning, especially in cross-vector and whole-system areas.	The RESP works with networks to develop network planning standards, provides feedback on network plans and supports whole-system strategic network development.	The RESP plays a lead role with networks to develop network planning standards and supports whole-system strategic network development.
<b>Place-based engagement &amp; coordination</b>	Ensures that local requirements are being reflected in network development rather than directly through engagement by the RESP.	Engages with local authorities and stakeholders. Facilitates regional engagement for major energy projects.	Regularly engages with local authorities, devolved gov. etc. Ensures local requirements as reflected in network plans.
<b>Supporting local actors</b>	Signposting to resources and facilitating engagement between local actors. Does not get involved in specific planning issues or mediate between networks and local stakeholders.	Providing resources, data and tools for local actors. Involved in local planning, LAEPs, etc. Acts as a mediator between local actors.	Providing resources, data and tools for local actors. Actively involved in local planning, LAEPs etc. Acts as a convener and mediator between local actors.

- Forecasting
- Network planning
- Network investment

# The DNO network development process

The network development process can be split into several sub-processes, from stakeholder engagement through to deciding and investing in network planning outcomes:



## Engagement

Engagement with local authorities, regional stakeholders, developers, trade bodies, communities and devolved governments.



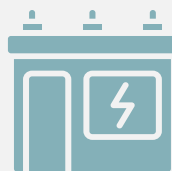
## Load forecasting

Detailed, half-hourly load forecasts that are mapped onto network assets and electricity supply areas. Developed using bottom-up analysis within the framework of national scenarios, a DNO 'Best View' scenario and potentially other sensitivity scenarios. Inputs from national and regional plans, connection data, market insight, data exchange from local planners, wider stakeholder engagement and numerous input data sources.



## Network (constraint) planning

The tools, processes and approaches used by DNOs to analyse load forecasts, identify network constraints and assess a range of possible solutions.



## Optioneering

Cost-benefit analysis approaches (including whole-systems CBA and cross-vector considerations), interaction with DSO roles and approaches to network investment. This includes the use of flexibility and other network solutions.



## Sanctioning investment

Approval and delivery of network investment, including ensuring that proposed investment is sufficiently strategic, locally informed and, where possible, cross-vector.



- Forecasting
- Network planning
- Network investment

# Collaboration is critical, but the DNOs must remain responsible for network development

The DNOs expect to work closely with the RESPs to ensure direct alignment between the RESP outputs and the input data used in the DNO network development process.

Ultimately, the DNOs must retain clear accountability for end-to-end network development in fulfilment of their licence and statutory requirements, including decisions around solutions, such as flexibility or network reinforcement.

While the content, level of detail, timing and frequency of RESPs' outputs have yet to be defined and are likely to evolve as RESPs develop, a set of principles for working together could be adopted.

## Core principles for collaborative working

The RESPs are expected to be responsible for regional energy requirements planning, including setting out an energy pathway that is aligned with the region's decarbonisation and growth ambitions and national energy strategic plans and pathways.

Once the RESPs are fully established, an aligned regional energy pathway should ideally be the 'primary input' that DNOs use to develop their network load forecasts. In turn, those load forecasts should form key inputs to DNOs' network development processes. Close collaboration – sharing data sources, load growth analysis and engagement activities – should ensure alignment and no surprises.

DNOs will remain responsible for the load forecasts they use and their due diligence. In practice, this might mean:

- DNOs would need to apply an appropriate sensitivity analysis to explore network resilience, different technical solutions, alternative scenarios and uncertainties and facilitate programme deliverability.
- If a RESP's plan resulted in a network load forecast that differed significantly from DNO forecasts – such as where bottom-up connections or load growth data have diverged due to timing issues, or regional and national plans diverged – this would be identified as part of a collaborative, iterative, continuous improvement process between the RESPs and DNOs.

- Forecasting
- Network planning
- Network investment

# It is important that DNOs retain final responsibility for load forecasting

The outputs of the RESPs' whole-system energy plans should be primary inputs into the DNOs' network asset load forecasting and may, in many cases, be used directly.

However, in order for the DNOs to explore a range of possible futures and fulfil their licence and statutory requirements to operate a safe, resilient and reliable network, the final responsibility for load forecasting should remain with the DNOs.

## Existing capabilities and knowledge

While there are a number of clear areas for the RESPs to add value, the existing capabilities of the DNOs drive efficient and effective load forecasting.

The established processes and knowledge of the DNOs in each licence area currently allow each region's energy resources, geographies, socio-economic factors and network topographies to be reflected in bottom-up, spatially granular forecasts driven by data and local stakeholders.

While a coherent whole-system energy plan would improve coordination in energy system planning, DNOs will still need the ability to explore alternative outcomes in their network planning to ensure the delivery of a safe, efficient and economical network (as per [Section 9 of the Electricity Act 1989](#) and [DNO safety accountabilities](#)) and connection of customers ([Section 16](#)). The load forecasts directly inform the DNOs' LTDS and NDP plans, detailed in [Conditions 25 and 25B of the Standard Licence Conditions](#). As such, retaining final responsibility for load forecasting is vital.

NPG DFES visualisation tool



UKPN Your Local Net Zero Hub



- Forecasting
- Network planning
- Network investment

# Energy need is just one important piece of the complex load forecasting puzzle

There are several key differences between the anticipated outputs of the RESPs' regional energy plans and the DNOs' load forecasting.

DNO load forecasting – the mapping of dozens of different types of electrical generation and demand loads to half-hourly load profiles and highly granular network assets – is complex. Load forecasting is embedded into the network planning processes that are core to DNOs fulfilling their accountabilities.

RESP forecasting of energy needs, in terms of overall megawatt-hours for different sources of generation and demand, could be one of the primary inputs to load forecasting. This could be similar to how the Strategic Spatial Energy Plan is anticipated to inform transmission network energy needs.

The spatial granularity of the RESPs' plans is not yet defined and may evolve over time. Producing energy needs to Grid Supply Point level would be suitable to reflect in DNO load forecasting, without duplicating the much more granular load forecasting that DNOs currently undertake across their entire networks.

## RESP: Energy need analysis

This could be by region or GSP, or in some cases even more granular.

## The Market: Connections

DNOs must reflect the most up-to-date connections data in their load forecasts.

## DNO: Load analysis by load source over time (Baseline, connections pipeline, long-term projections)

DNOs produce load forecasts to dozens of ESO Building Blocks at a minimum. Sub-categories within this are more granular, with over 100 sub-technologies modelled across the DNOs' load forecasts.

## DNO: Load profiling

Each form of electricity generation and demand is modelled at a half-hourly granularity to understand its impact on maximum and minimum network demand.

## DNO: Mapping to network assets

DNOs produce load forecasts down to low-voltage 'street' level. This means energy needs and connections must be mapped to hundreds of thousands of highly granular geographic areas.

## DNO: Load forecasting outputs

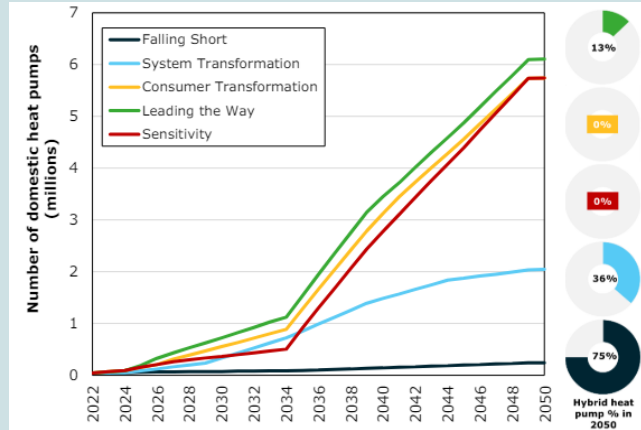
Current and forecast loads on network assets across the DNOs' networks, from high-voltage substations to low-voltage transformers and feeders.

- Forecasting
- Network planning
- Network investment

# Examples of DNO load analysis, profiling and mapping to network assets

## DNO: Load analysis by load source over time

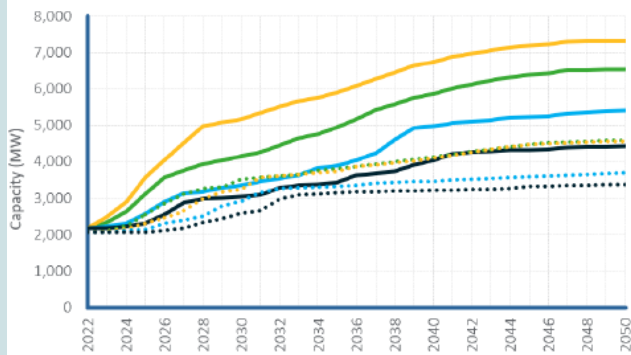
### Domestic heat pump uptake by scenario, UKPN



Source: DFES 2024, UKPN

## Onshore wind uptake by scenario, SSEN

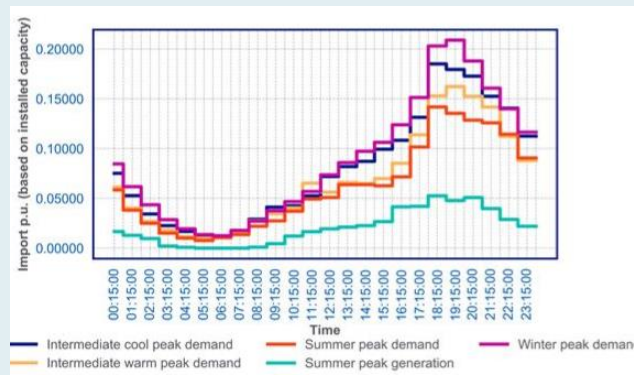
### Onshore wind by scenario - SSEN DFES 2023 Comparison to the FES 2023 data for the North of Scotland



Source: DFES 2023, SSEN North of Scotland licence area

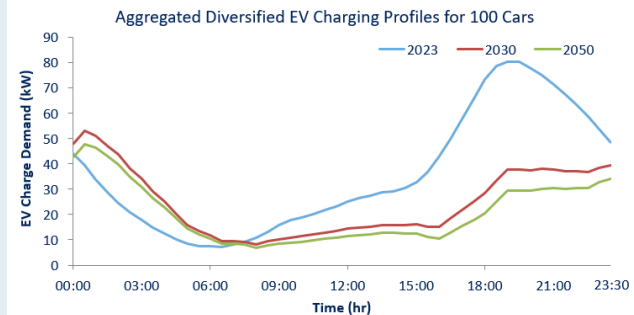
## DNO: Load profiling

### Residential EV charge point demand half-hourly demand profile, NGED



Source: DFES 2024 Customer behaviour profiles and assumptions report, NGED

## Residential Diversified EV charging profiles, ENWL



Source: DFES 2023 Data Workbook, ENWL

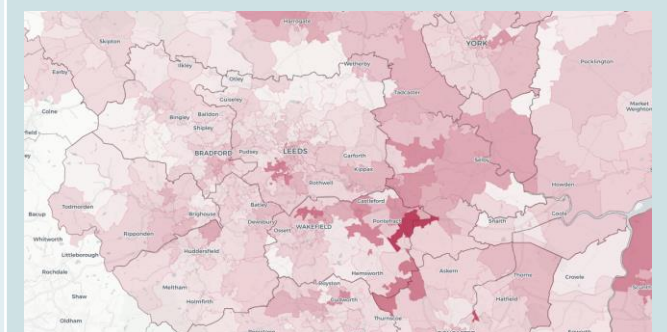
## DNO: Mapping to network assets

### Peak demand growth by primary substation area (Leading the Way, 2050), SP Manweb



Source: DFES 2023, SPEN

## Industrial and commercial energy consumption by primary substation and local authority, NPG



Source: DFES 2023, Northern Powergrid

- Forecasting
- Network planning
- Network investment

# The DFES load forecasting process could be adapted to incorporate strategic and whole-system energy plans produced by the RESPs

Similar to how the DFES currently references ESO FES scenarios, RESPs' plans could be reflected within the DNOs' DFES process.

Through close collaboration between RESPs and the DNOs, the regional energy pathway should become the primary input that DNOs use to develop their network load forecasts.

## Efficient load forecasting

DNOs have built up their load forecasting processes over many years of iteration and innovation to meet obligations such as [RIIO-ED2 Regularly Reported Evidence on forecasting accuracy](#). Incorporating RESP functions into the existing process should be the most efficient way to build on this existing work.

## The Best View process

The RESPs' engagement with regional stakeholders, support for local authorities, and cross-vector analysis can be incorporated into the DNOs' DFES.

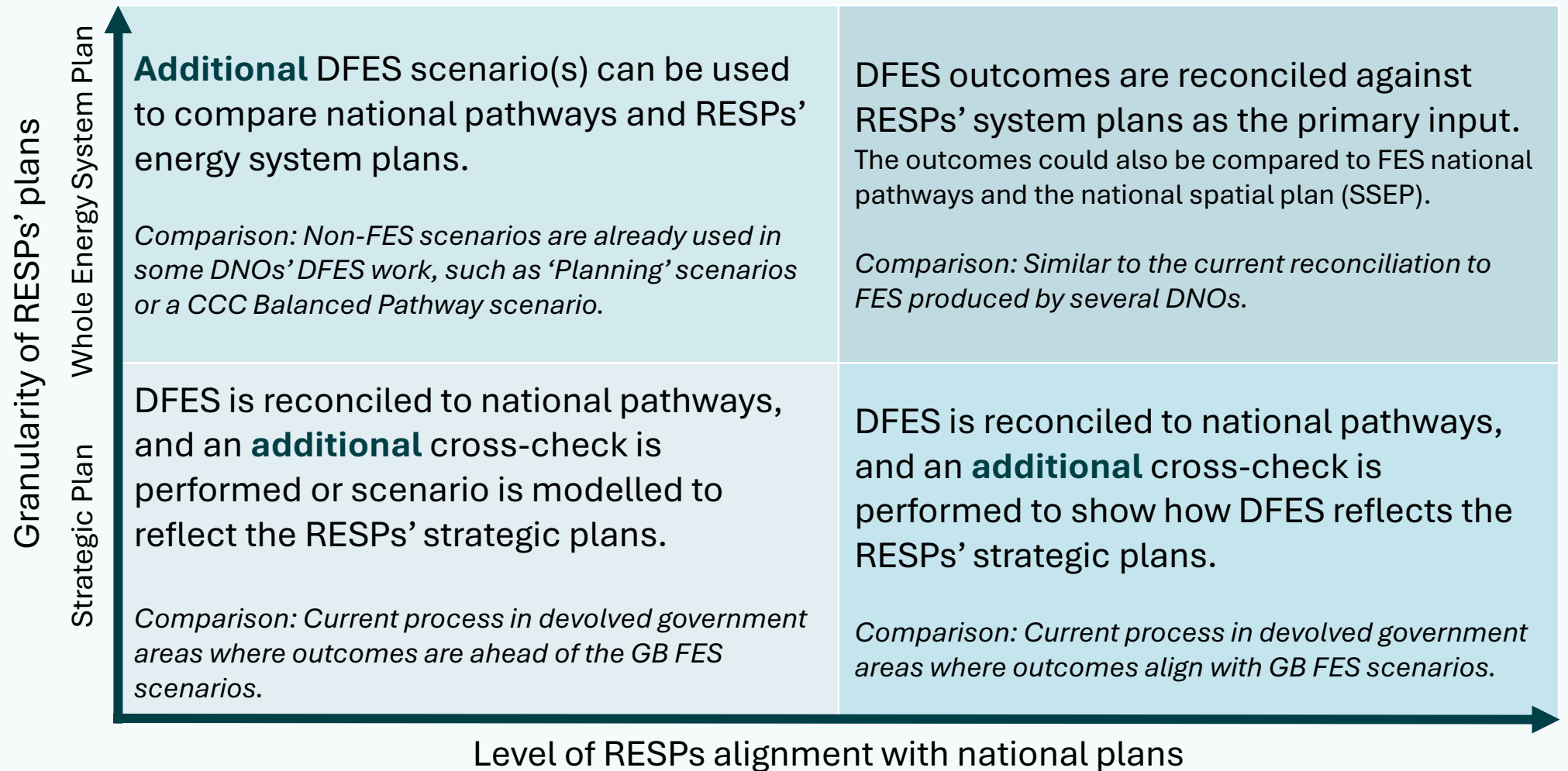
In addition, the DNOs expect to work closely with the RESPs to reflect regional energy plans in the DNOs' Best View planning scenarios, adding confidence that these scenarios are aligned with national plans and represent regional stakeholders.

DNOs will remain responsible for the load forecasts they use, including their Best View scenarios. Insight from this process will feed back into the RESP's plans to create a collaborative, iterative cycle between RESP planning and DNO load forecasting. Whether the RESPs' outputs are directly reflected in the DNOs' Best View forecasts will depend on how the RESPs' plans are defined and developed over time.

- Forecasting
- Network planning
- Network investment

# Adapting the DFES process to incorporate RESPs' plans

Depending on the granularity of the RESPs' plan outputs, and the level of alignment with national plans, the DFES process could be adapted to incorporate RESPs' plans as a 'primary input'. There are existing examples of DFES using similar inputs, such as the current uses of FES, devolved government energy plans and additional non-FES scenarios used by DNOs to investigate specific outcomes.



- Forecasting
- Network planning
- Network investment

# RESPs could have a role in aiding and improving standardisation of approaches across network planning

For example, coordinating between energy networks to help harmonise approaches to regionally reflective load profiles, customer archetypes and forecasting methodologies.

This would need to be coordinated with the networks and the ENA, who are already working in areas of innovation, best practice and standardisation.

Timing is important – there is a pressing need for standardisation of approaches ahead of the RIIO-ED3 planning process.

## The Energy Networks Association (ENA)

The ENA is well-placed to lead and work alongside any standardisation activities undertaken by the RESPs and the networks. Programmes such as ‘Open Networks’ and the ‘System Forecasting Group’ are already tackling approaches to network planning across the DNOs.

### Standardising approaches and methods rather than direct network planning inputs

DNOs have built up knowledge of their customers’ regions and have, in many cases, developed network planning inputs to take regional variation into account.

Standardising network planning inputs, rather than approaches to these inputs, may fail to reflect these regional nuances.

However, in areas where the RESPs could add a whole-system perspective to current assumptions – particularly in the case of cross-vector technologies – this would be a clear complementary role.

ENA Open Networks programme



- Forecasting
- Network planning
- Network investment

# Providing additional assurance and advice on certain specific, relevant aspects of DNOs' plans could be a key complementary role for RESPs

RESPs, and their regional governance bodies, could provide additional assurance and independent evidence to confirm that aspects of proposed DNO plans are aligned with the whole-system regional energy strategy.

However, this would need to aid and assure plans rather than just adding an additional layer to the review process.

## Specific, relevant aspects of DNO plans

The RESPs' role in assuring specific aspects of DNO plans should be focused on plans that are major in scale or scope, related to network load, and taking a long-term (2050) view on requirements.

Existing examples that fit these criteria are anticipatory reinforcement for off-gas grid communities, proactive domestic service unlooping and enabling rapid EV charging at motorway services.

## 'RESP assured' investment proposals

The RESPs could have a key role in confirming that load-related DNO network investment proposals benefit the region across the whole energy system, represent democratic input into the regions' strategic energy plans and align with both regional and national energy plans. This would result in a higher degree of confidence for Ofgem around the proposed investment.

## The role of RESPs vs the role of Ofgem

The RESPs' assurance that investment proposals align with the regions' energy plans would support whole-system decision-making. In this case, RESPs would be best suited to being a key third party. Ultimate responsibility for funding approval in the current regulatory model should remain with Ofgem.



- Forecasting
- Network planning
- Network investment

# There must be a clear strategy for RESP roles in ED3, with transitional arrangements in place

Developing the RESPs' functions and regional plans will take time. They are unlikely to be in place by the start of the RIIO-ED3 planning process in 2025.

Establishing a clear planning framework for RIIO-ED3, including an approach to defining planning scenarios and a baseline pathway, will aid DNO planning ahead of the RESPs' implementation.

There may be an opportunity for the new RESPs to participate in ED3 planning activities. However, introducing a new RESP-based process midway through ED3 planning would be disruptive.

## National Energy System Operator (NESO) activities ahead of RIIO-ED3

The DNO group has identified activities that NESO could aid in during RIIO-ED3 planning ahead of the RESPs being fully established:

- Definition of a common planning scenario and baseline pathway.
- A common approach for assessing the maturity of local plans.
- Whole-systems planning for large industrial clusters.

Any role in ED3 planning for early forms of RESPs would have to be carefully considered and managed to ensure that the DNOs can continue to undertake business planning efficiently.

## Beyond ED3

The role of the RESPs in future price control periods – beyond RIIO-ED3 – requires careful consideration.

There could be a role for RESPs in supporting specific areas of future business plans, such as assuring that whole-system regional energy strategies have been reflected as a primary input to load-related investment plans.

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of DNO accountabilities

The following pages detail key DNO accountabilities from the Electricity Act 1989, Electricity Distribution Standard Licence Conditions, Distribution System Operation Incentive Governance Document, Annex 1 of the RIIO-ED2 Regulatory Instructions and Guidance, and RIIO-ED2 Business Plan guidance. Commentary is provided on how these accountabilities may interact with the proposed RESP functions and roles.

## Electricity Act 1989

Accountability	Potential interaction with RESPs
<p><b>Section 9. General duties of licence holders.</b> It shall be the duty of an electricity distributor— (a)to develop and maintain an efficient, co-ordinated and economical system of electricity distribution;</p>	<p>All aspects of the RESPs’ interaction with the network development process will have to be considered in the context of this overarching duty. Load forecasting, network planning and optioneering are fundamentally tied to upholding this duty.</p>
<p><b>Section 16. Duty to connect on request.</b> (1) An electricity distributor is under a duty— (a) to make a connection between a distribution system of his and any premises, when required to do so [...] for the purpose of enabling electricity to be conveyed to or from the premises; (2) Any duty under subsection (1) includes a duty to provide such electric lines or electrical plant as may be necessary to enable the connection to be used for the purpose for which it is required.</p>	<p>The RESPs are not anticipated to be directly involved in the DNO connections process. However, there is significant overlap between DNO network development and connections-led reinforcement. Currently, this is managed by the DNOs ensuring that their network plans are agile in order to meet demand for new connections. Where the RESPs are interacting with network development, it is important that this agility and final responsibility remains with the DNOs in order to fulfill this duty.</p>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## Electricity Distribution Standard Licence Conditions (1 of 2)

Accountability	Potential interaction with RESPs
<p><b>7A.2</b> The licensee must coordinate and cooperate with other Electricity Distributors and Transmission Licensees to seek to identify actions and processes that advance the efficient and economical operation of the Total System.</p>	<p>Where DNOs currently engage with other network operators, an additional line of communication will be necessary with the relevant RESP. For distribution licence areas that span multiple RESP boundaries, the level of coordination may require an increase in time/resources.</p>
<p><b>12.1</b> The licensee must, on receiving a request from any person (“the requester”) asking it to do so, offer to enter into an agreement for Use of System under which it will: (a) accept into the licensee’s Distribution System, at any Entry Point and in any quantity that was specified by the requester in the request, electricity that is provided by or on behalf of the requester; and (b) distribute that quantity of electricity (subject to any distribution losses) to such Exit Point on the licensee’s Distribution System and to any person as the requester may specify.</p>	<p>As per the RESPs’ potential interaction with Section 16 of the Electricity Act 1989, there are links between DNO network planning and connections-led reinforcement. Where the RESPs are interacting with network planning, it is important that plans remain agile in order to account for new connections, and that final responsibility remains with the DNOs in order to fulfil this licence condition.</p>
<p><b>19.8</b> In implementing and maintaining the Distribution Code and in complying with its obligations under that code (including in respect of the scheduling of the maintenance of its Distribution System), the licensee must not show undue preference to, or unduly discriminate between, any person or class or classes of persons.</p> <p><b>20.1</b> The licensee must comply with the Grid Code.</p> <p><b>20.2</b> The licensee must at all times have in force, implement, and comply with the Distribution Code.</p> <p><b>21.4a</b> Permit the development, maintenance, and operation of an efficient, coordinated, and economical system for the distribution of electricity.</p>	<p>In some cases, a RESP’s plan may involve prioritising a certain type of project over another (for example, EV charge points for public transport, which may be required to achieve local objectives). It would need to be made clear whether this represents undue preference, which is prohibited under the current Distribution Code.</p>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## Electricity Distribution Standard Licence Conditions (2 of 2)

Accountability	Potential interaction with RESPs
<p><b>24.1</b> The licensee must plan and develop its Distribution System in accordance with: (a) a standard not less than that set out in Engineering Recommendation P.2/7 of the Energy Networks Association, or set out in any subsequent Engineering Recommendation in the EREC P2 series of the Energy Networks Association, as may be directed by the Authority, so far as that standard is applicable to it.</p>	<p>There are several conditions in the Standard Licence Conditions that reflect an efficient and economical electricity distribution system. The DNO must retain the ability to discharge their compliance with Grid Code, Distribution Code or Engineering Recommendation P.2/7 after the implementation of any proposed RESP functions.</p>
<p><b>25.2</b> Where the Authority gives the licensee a direction to do so, the licensee must prepare and maintain a document, to be known as the Long-Term Development Statement (LTDS).</p> <p><b>25B.3</b> The licensee must use reasonable endeavours to ensure that each Network Development Plan (NDP) published by it covers the investments planned for the next five-to-ten-year period in relation to the 11 kV network and above, but it may exclude secondary transformers and all pole mounted transformers. The Network Development Plan must include: (a) a description of those parts of the licensee's Distribution System most suited to new connections and distribution of further quantities of electricity; (b) a description of those parts of the licensee's Distribution System where reinforcement may be required in order to connect new capacity and new loads, including to facilitate the deployment of Electric Vehicle Recharging Points.</p>	<p>Currently the LTDS and NDP are developed using the DNOs' DFES load forecasts. The nature of the DNO/RESP interaction on these key documents must address:</p> <ul style="list-style-type: none"> <li>• If DNO plans align with the RESP pathway(s), then no action needs to be taken.</li> <li>• If DNO plans materially misalign with the RESP pathway, then the DNO and RESP will need to coordinate changes to either the DFES or the RESP pathway until they reach alignment.</li> <li>• If the DNO's licence area spans multiple RESP boundaries, a situation could arise where the DFES plans align with the pathway of one RESP but not another.</li> </ul>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## Distribution System Operation Incentive Governance Document: DSO Baseline expectations

Accountability	Potential interaction with RESPs
<p><b>1.1.1</b> DNOs to define and develop enhanced forecasting, simulation and network modelling capabilities, with processes in place to drive continual improvement to meet network and user needs.</p>	<p>The interface between RESP plans and DNO load forecasting is key to this expectation, as RESPs are not anticipated to be directly involved in network modelling or simulation. The DNOs retaining final responsibility for load forecasting, with RESP outputs as a primary input, would allow DNOs to continue to develop enhanced load forecasting processes.</p>
<p><b>1.1.3</b> DNOs to have in place standard and effective processes for sharing network planning information with other network licensees, including the ESO, network users and other interested parties, for example to enable innovation and support the development of local authority and devolved government plans for decarbonisation.</p>	<p>The RESPs will be a key party with which to share network data. Current DNO data-sharing processes (such as Open Data Portals and interactive web maps) are already used by local authorities and devolved governments to undertake local, regional and national planning.</p>
<p><b>1.1.4</b> DNOs to have in place transparent and robust processes for identifying and assessing options to resolve network needs, using competition where efficient.</p>	<p>The RESPs are not anticipated to be significantly involved in the optioneering process of identifying network solutions. However, the identification of network needs, such as network constraints, is driven by DNO load forecasting. As such, it is important that DNOs retain final responsibility for load forecasting in order to robustly anticipate future demands on the network.</p>
<p><b>3.1.2</b> DNOs should, with stakeholder input, develop robust strategies for how they will collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.</p>	<p>The RESPs' function in place-based engagement and facilitation should aid this expectation, helping to coordinate between regional stakeholders and work with the DNOs to understand what information should be published.</p>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## RIIO-ED2 Regulatory Instructions and Guidance - Annex I – DSO

### DSO Regularly Reported Evidence

Accountability	Potential interaction with RESPs
<p><b>RRE 1: Flexible Connections:</b> Licensees must report the number of users and the total flexible import capacity and/or flexible export capacity in MW for each of the following types of Flexible Connections.</p> <p><b>RRE 2: Primary Network Forecasting Accuracy:</b> Licensees must report the forecast and actual maximum demand for substations on the Primary Network.</p> <p><b>RRE 3: Transformer Utilisation:</b> Licensees must report this through the LRE Volume Drivers Workbook, as set out in further detail in the RIIO-ED2 LRE Volume Drivers Governance Document.</p> <p><b>RRE 4: Network options assessment outcomes:</b> Licensees must report the number of potential reinforcement schemes that have been assessed using the CEM tool developed by the ENA, or equivalent CBA tool, on whether to defer conventional reinforcement through the use of distribution flexibility services.</p>	<p>DNOs are required to ensure security of supply and economic network development; load forecasting is a key tool used to help meet this requirement. Therefore, DNOs will need to retain the final responsibility for load forecasts in order to meet this overarching accountability.</p> <p>The ED2 requirements for monitoring forecasting accuracy mean that, should a DNO be expected to align to RESP approved pathways and these pathways are inaccurate, the consequence will be poor performance against these reported metrics.</p>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## RIIO-ED2 Business Plan Guidance

While the RIIO-ED2 guidance was defined before the creation of the RESP role, this guidance details what DNOs are currently accountable for across their network development processes. This is expected to be updated for RIIO-ED3.

Accountability	Potential interaction with RESPs
<p><b>5.7</b> Each DNO will have to translate national pathways into scenarios that are applicable for its licence area. In establishing these scenarios, DNOs should engage with local stakeholders to understand what trajectory for decarbonisation is likely to be followed in that licence area.</p>	<p>This is a key area of overlap between the RESP and current DNO accountabilities. In many cases, this could be complementary and additive if implemented well.</p>
<p><b>5.17.</b> Careful consideration must be given to the timing of investment decisions. A robust strategy may bring forward in time investment in capacity which, even if not immediately needed at the proposed time under a DNO's assumed forecast, is nevertheless likely to be eventually needed in any case. This might be desirable to prevent piecemeal expansion, but the case for it must be carefully justified.</p>	<p>Where the outcome of a regional strategic plan by the RESP and its stakeholders is likely to require or trigger network investment, the timing and evidence behind this investment is currently a key DNO accountability.</p> <p>The RESP pathway will need to account for the level of justification required in order for network investment to be accelerated, and reflect this in any regional plan. Otherwise, there is a risk of RESP plans not matching what is achievable to develop under the current business plan guidance.</p>

- Forecasting
- Network planning
- Network investment

# Appendix: Tables of key DNO accountabilities

## Accountabilities related to distribution network safety and interruptions

The DNOs must maintain a number of key overarching accountabilities around network safety and interruptions, including:

- Electricity (Standards of Performance) Regulations 2015
- Electricity (Connection Standards of Performance) Regulations 2015
- Electricity Safety, Quality and Continuity Regulations 2002
- Electricity Distribution Licence Special Condition 4.2 – Time to connect output delivery incentive
- Electricity Distribution Licence Special Condition 4.4 – Interruptions incentive scheme output delivery incentive

If DNOs did not retain final responsibility for load forecasting and wider network development, this could impact network safety, reliability and customer service provision – including the probability of and response to interruptions to electricity supply and the timeliness of connections to the distribution network.

In a more extreme case, requiring the DNOs to plan their networks using forecasts for which they do not have final responsibility could result in impacts on safety due to unplanned loading on network assets.



Regen is an independent not-for-profit centre of energy expertise and market insight whose mission is to transform the world's energy systems for a zero-carbon future.

Regen  
Bradninch Court  
Exeter  
EX4 3PL

+44 (0)1392 494399  
admin@regen.co.uk

[regen.co.uk](https://www.regen.co.uk)

Registered in England No: 04554636

This report was produced on behalf of	Energy Networks Association
Prepared by	Jonty Haynes Johnny Gowdy Frank Hodgson
Reviewed by	Johnny Gowdy
Version	1
Date	01 July 2024

All rights reserved. No part of this document may be reproduced or published in any way (including online) without the prior permission of Regen.

