

# Thank you for joining

# Housekeeping

- Please note that this session will be recorded.
- Please add your questions via Q&A function for our dedicated session at the end of the talk – 30 minutes Q&A.
- Questions and Answers supported by Environmental, Connections, Responsible Business and Whole System Planning leads.
- Alternative for raising questions pathwaytonz@nationalgrid.com

Agenda	
Introduction	5 mins
Forming Future Network Blueprints	10 mins
London Future Network Blueprint	10 mins
Next Steps	5 mins
Environment commitments	5 mins
Update from SSEN and UKPN	15 mins
Update from NESO	10 mins
Questions and Answers	30 mins

# Introduction

# Sara Habib Head of Future Price Controls

National Grid Electricity Transmission





We own and operate the transmission network that is the backbone of electricity system in England and Wales The objective of today's webinar is to set out the London view of the future network outlined in our business plan for 2026-2031.

Our £35bn business plan was submitted in December 2024 and will now be assessed by Ofgem.

Our plan will nearly double the amount of power we can transfer across England and Wales and more than double the rate of connecting our customers.

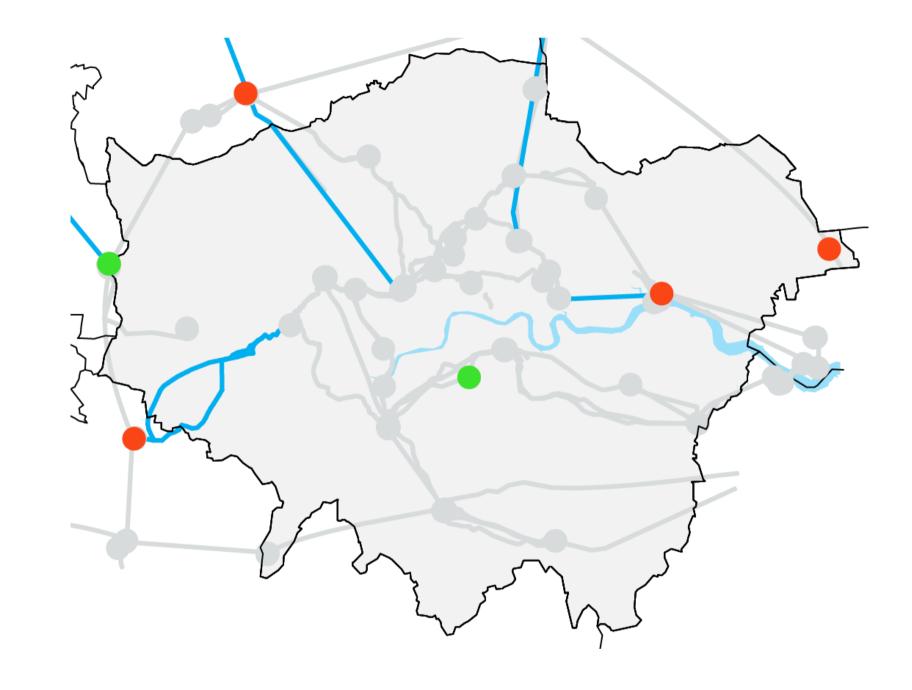
We want stakeholders to be involved in the 'call for evidence' that Ofgem has opened as part of the RIO-T3 price control process and to feel well-informed on what is included in our plan and why.



# Context on our regional plans

This regional view considers electrical factors such as power transfers and access for planned outages and, where possible, aligned to the distribution network operator and local authority boundaries.

This webinar is not about the detailed project development, precise location, or technology options under consideration for individual network upgrades. That comes through individual project consultations, in line with Planning Act requirements.



Please contact us for project details at Communityrelations@nationalgrid.com

This webinar is part of our ongoing engagement. For the past couple of years we held regionally focused workshops, bringing together local organisations, like local authority representatives, businesses, other network companies and the National Electricity System Operator (NESO), to gather perspectives and co-create our network plans.

# Forming the Future Network Blueprints

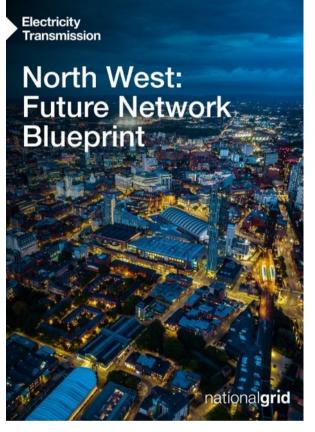
Peter Beckley
Regional Strategy Engineer

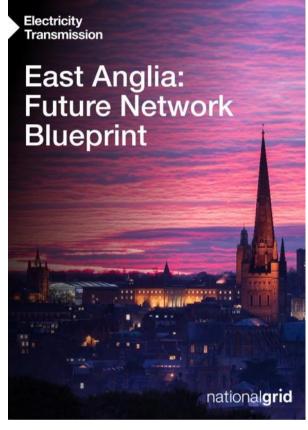
National Grid Electricity Transmission

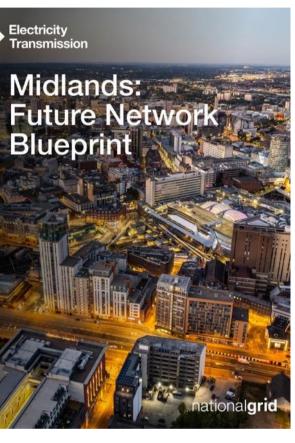


# Future Network Blueprints



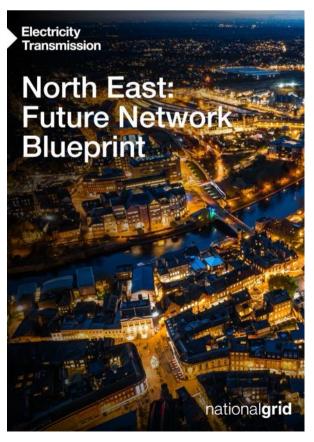














#### What are they?

A single and coordinated 'best view' of the work needed across different regions of our network across England and Wales to enable the overall transition to net zero.

#### What do they do?

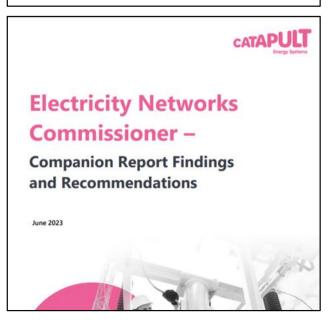
They help us to make coordinated decisions about where, when and how to upgrade the grid.

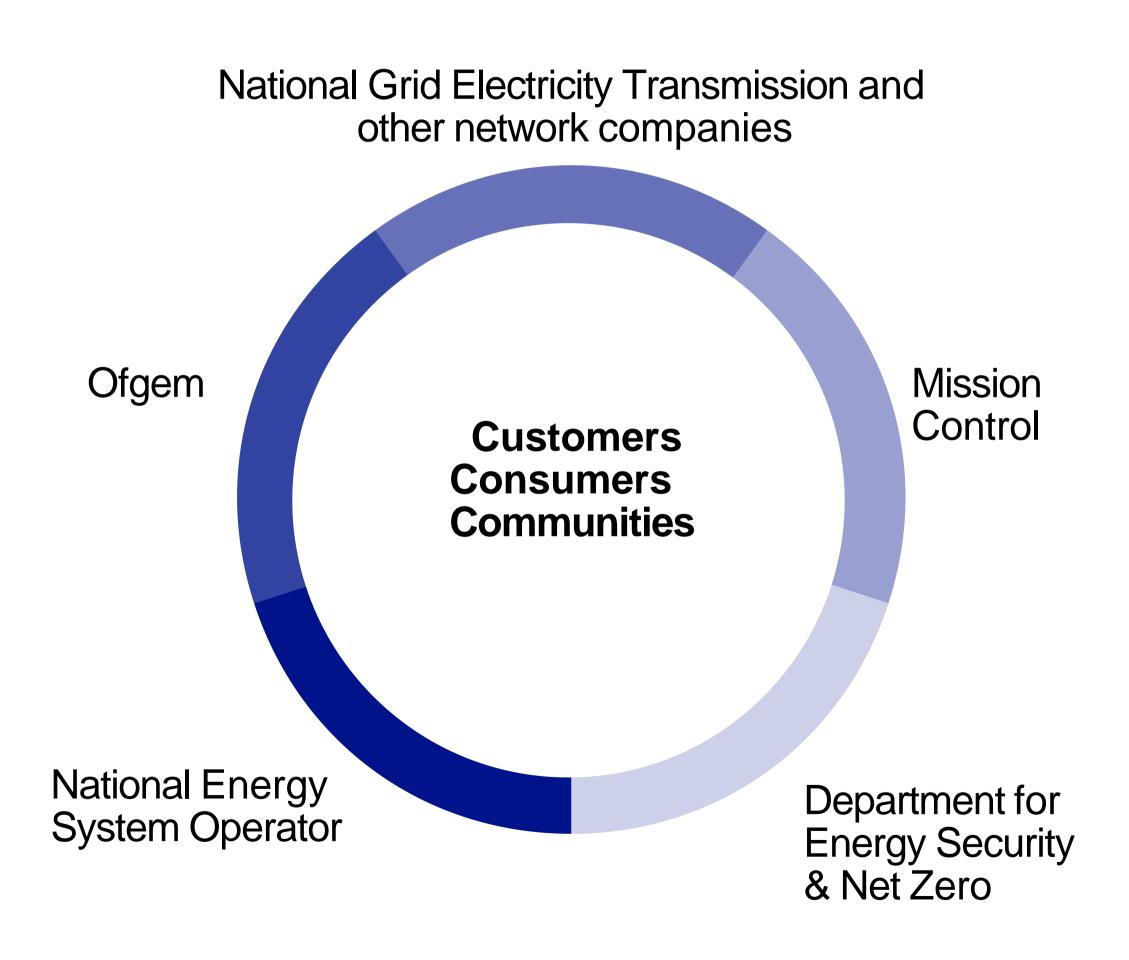
This forward- thinking, holistic planning approach allows all parties to enhance efficiency through collaboration and coordination — with an aim to do it once, do it right.

# The energy landscape















# Our overarching nationwide Stakeholder engagement approach

Since 2022 we have listened to and worked with those who are impacted by the design, timing, cost and delivery of the network upgrade...

Understanding the needs, priorities and perspectives of Listening a broad spectrum of involved and impacted stakeholders, including household and business consumers **Optioneering** Testing and challenging the emerging strategies during formation, including any trade-offs or and testing optioneering required Sharing the next iteration of the strategies and how Sharing they have built on the stakeholder input to that point with colleagues and the broader stakeholder network Continuing to Refine and Share, maintaining the Future Refining Network Blueprints and keeping them relevant through enhanced ongoing engagement

...And this approach continues beyond our December RIIO-T3 Business Plan submission to Ofgem, as we refine its details throughout delivery.



We listened to over 12,000 voices representing all stakeholder groups

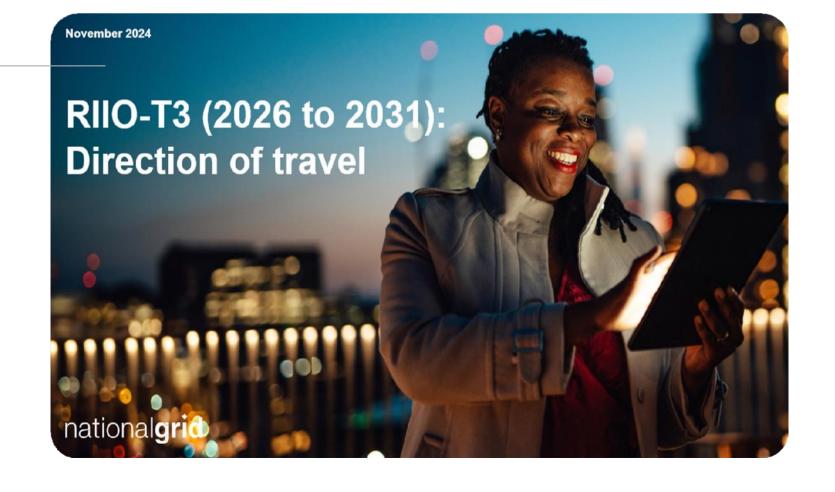


We consulted with over 23,000 residents in communities already impacted



We held 35 region focussed workshops with our industry partners and peers

We hosted a playback webinar on our T3 plan in November



# What we learnt – forming our network planning approach

With an ever-evolving energy landscape, we needed a more comprehensive approach to our network planning



listening phase we got to understand the detail...



We need to work more closely than ever with all our stakeholder groups



Local network needs differ, requiring a more focused approach



By thinking differently, and working closely with stakeholders, we can help transform the electricity network to meet everyone's future energy needs.



Visibility of our investment planning is critical



We need to coordinate and collaborate on our plans



We need to be flexible to changes and not wait for 100% certainty













## The process

Based on insights from our stakeholder engagement programme we set three ambitions which shape our plan

**Ambition A** 

Deliver the grid of tomorrow, today

Deliver with urgency the Transmission Network needed for Great Britain's future growth and decarbonisation

**Ambition B** 

Do the right thing for consumers, communities and the environment

How we deliver is as important as what we deliver

**Ambition C** 

Transform the way we work

Transform our capabilities to deliver for consumers

We have developed a comprehensive framework to test and validate our investments against our new ambitions.

This encompasses whole system planning; focused on an integrated and collaborative approach.

Step 1
Information gathering



- Regional context
- Current network view
- Design the right network

Step 2
Insights and analysis



- Stakeholder engagement
- Connections
- Safe and reliable network
- Strategic infrastructure

We now go on to unpack Step 2

Step 3

Develop strategic options

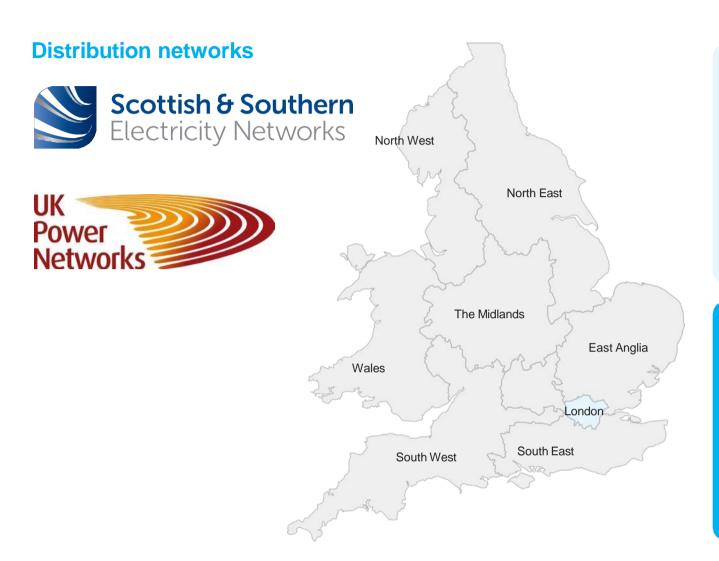


- 2050 backwards
- Network design principles
- Network compliance

# London Future Network Blueprint



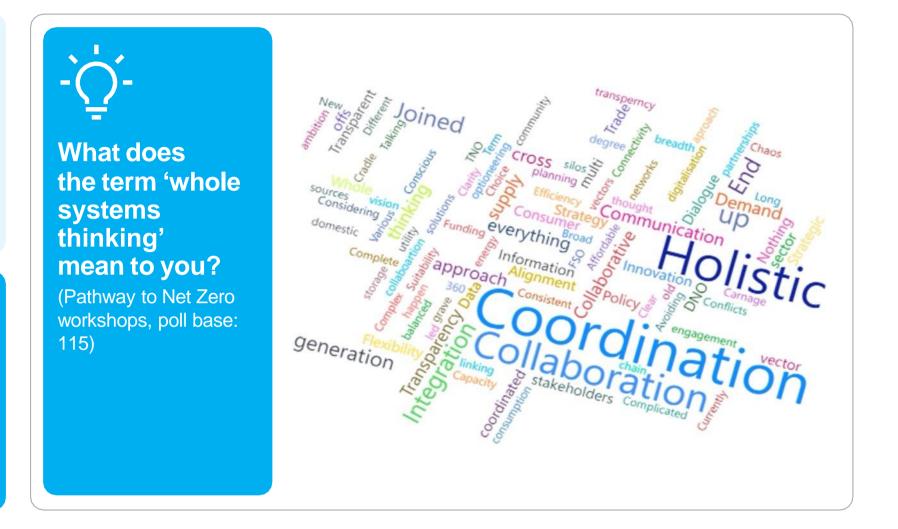
# London | Stakeholder Engagement



We are working with local distribution networks (DNOs) to understand the impacts and requirements in that region and develop 'whole-system' solutions.

[4]21

Indicates the number of whole system opportunities we have already identified in London





#### What did stakeholders in London initially tell us?

'Futureproofing is important. 'We have members that If (a business') energy needs are not being met that can then obviously lead to them moving out of the district. That has quite a big impact on local areas where we're obviously trying to increase jobs.' (Local Authority)

have abandoned projects because of long connection timelines. Connections are being offering in the late 2030s, to which they say 'that doesn't work for us any more.' (Industry Representative)

'There needs to be a look at deliverability of some of these projects. If there's a finite amount of trained people, does that mean we need to train more people.' (Academic)

**Connections timescales** have impacted my organisation's plans (Pathway to Net Zero workshops, poll base: 96)

## London | Safe and Reliable Network

A reliable network is a top priority for everyone.



#### Committment

Maintaining a safe, reliable and resilient system through a period of growth and changing asset base.



#### Challenge

If we looked to do this portfolio of work in isolation, we would not have enough resource, supply chain support or access to the network to complete it.



#### Solution

Our approach aligns asset health and new infrastructure plans to optimise best use of our resources.

#### Natural hazard resilience

By the end of 2025, all relevant London sites will be fully compliant with Energy Networks Association standard 138 on flood protection.

#### Physical security resilience

With increasing generation and demand we are investing in enhanced physical security at sites within the region.



High voltage substations identified in region that require enhanced asset health intervention Overhead line in region that requires replacement in the next 10 years

#### **Asset health intervention regional metrics**

齒5

Super grid transformer

口138

Circuit breakers

♦ 106

Voltage management assets

<sup>†</sup>β411

Bay assets

## London | Customer Connections

We need to make it easy to connect and use the electricity network



#### Committment

Enable the connection of new generation and demand customers to support Government targets.



#### Challenge

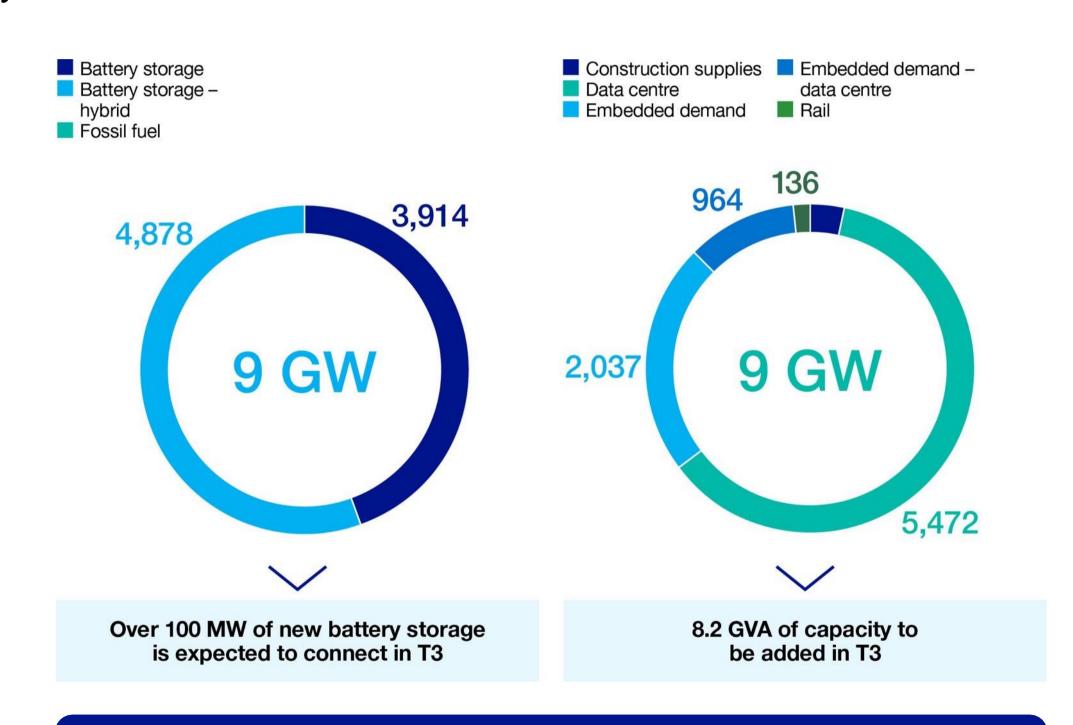
Not all the connections in the queue will connect to the network.



#### **Potential solutions**

We have progressed a number of connections which form a baseline and pipeline plan of work.

Connections Reform will help enable connections to the network by reviewing the current connections queue.



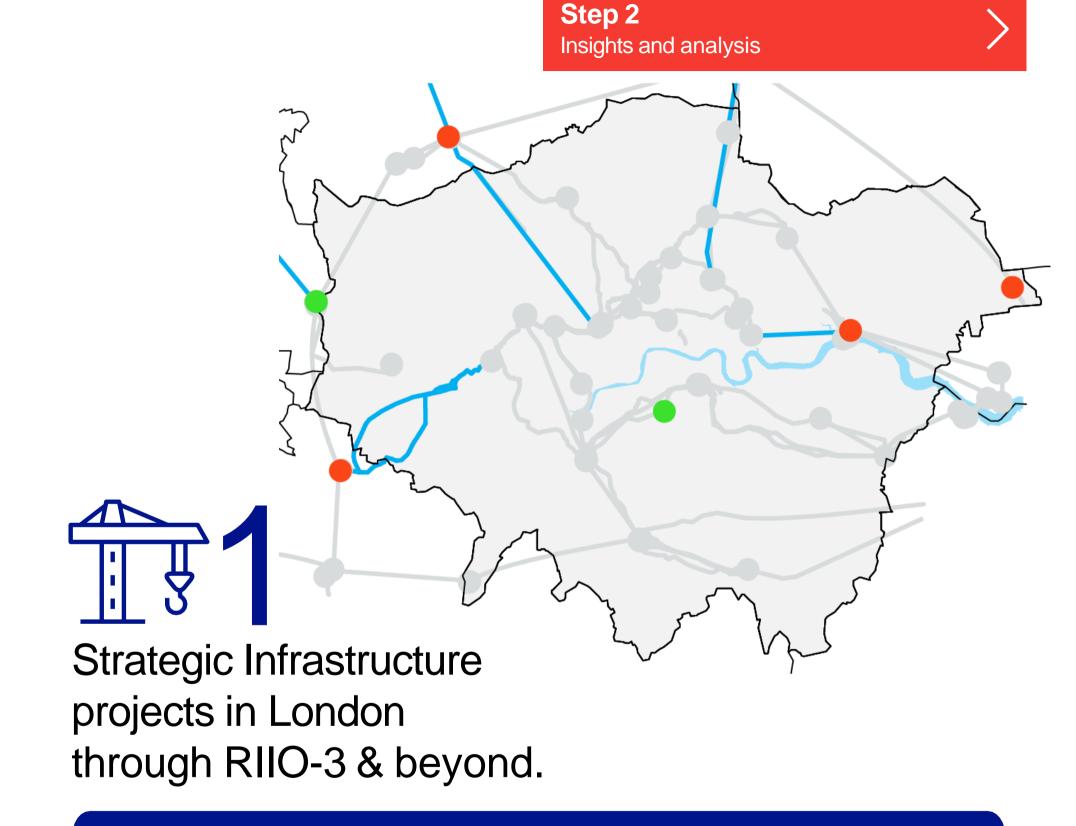
Customers have contracts for new connections to 2037 that would deliver **9 GW generation** and **9 GW of demand connections** in this region.

# London | Strategic Infrastructure

The National Energy System Operator (NESO) is responsible for identifying and timing of new strategic infrastructure on the electricity transmission network by incorporating;

- Energy scenario analysis
- Alignment with government policies on decarbonisation
- Market intelligence
- Stakeholder engagement to predict future energy needs.

The process is evolving to ensure that strategic infrastructure development is proactive, addressing both current and future challenges, and supporting the transition to a sustainable and reliable energy system.



In London we are maximising the use of existing infrastructure through upgrades, whilst also establishing new to support increasing power flows in the region.

# London | Plan Overview

We are focusing on upgrading and reinforcing the network to increase capacity to feed the growing demands and secure long-term resilience. This will enable the capital to meet its decarbonisation and net-zero ambitions.

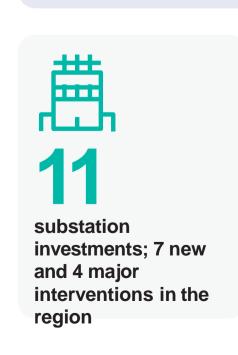
We have significantly enhanced the Central London network through our London Power Tunnel projects.

In North London we are reinforcing existing routes to improve power flows into Central and East London.

In West London we are enabling capacity at a number of sites to meet increasing demand needs of new housing infrastructure and data centres that are forming an increasingly important part of the UK digital economy.







114 MW estimated to

connect in T3



## ۲<u>۸</u>٦ ۸۸ 9 GW

#### demand

contracted to connect\*: 8.2 GVA of additional capacity expected to be installed in T3



#### of overhead line

reconductoring planned within T3, equating to 29% of the region

#### London Strategy

Substations



Map is illustrative

new substations including

Bengeworth Road and Uxbridge Moor



Major site strategy

Existing network Upgrade existing

New substation - Coastline

 New build Developing only\*

- NLR Hackney-Tottenham-Waltham Cross - Upgrade circuit - T3 period
- ESC1 Elstree-St Johns Wood - New circuit - Beyond T3
- Elstree-Sundon Reconductor OHL circuit - T3 period
- 10 Iver Amersham East Claydon - Reconductor OHL circuit - T3 period
- Ealing-Laleham 1 and 2 Cable replacement - Beyond T3
- 12 Ealing Willesden Cable replacement - Beyond T3
- BWRE Barking West Ham - Reconductor OHL circuit -T3 period

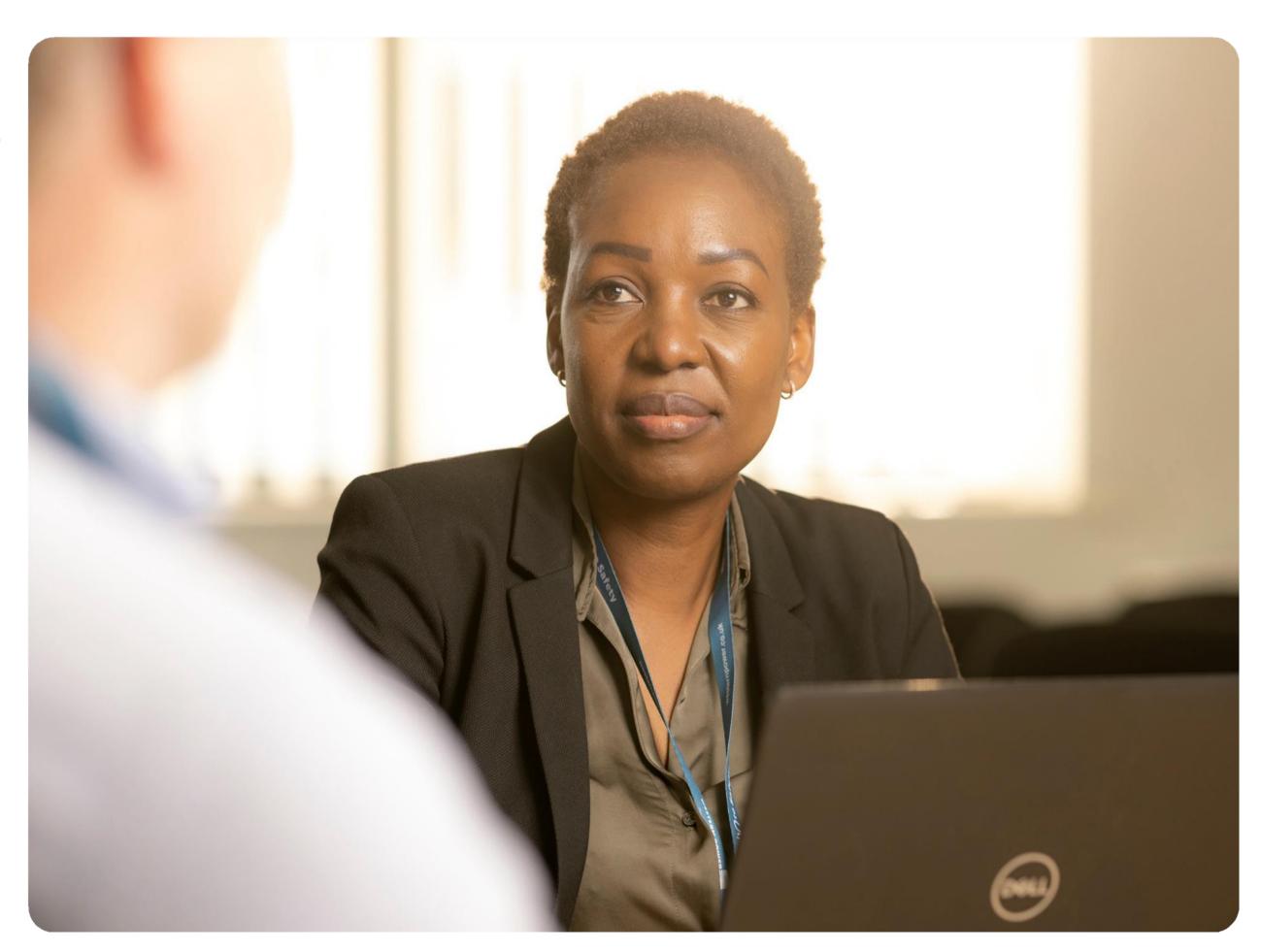
# Next Steps



# What's next for the London Future Network Blueprint?

We want to be transparent about our plans today and into the future. Planning is an ongoing, evolving process and we want to ensure we incorporate the needs and expectations of those impacted by their shape, direction and timing.

- Outcomes from Clean Power 2030 and Connections Process reform – We have designed our plans to be adaptable to changes.
- We continue to work with our network partners UK Power Networks (UKPN) and Scottish and Southern Electricity Networks (SSEN), stakeholders and the newly formed National Energy System operator (NESO) RESP team to evolve our 'Whole System' planning approach and regional plans.



# Environmental Update for London

Carolyn Helm Sustainability Technical Manager

National Grid Electricity Transmission



Please post any questions you have for us via Teams Q&A function or through: <a href="mailto:pathwaytonz@nationalgrid.com">pathwaytonz@nationalgrid.com</a>

# Delivering a sustainable electricity transmission network

#### **Our ambition**

The changes we are proposing to our Environmental Action Plan in T3 will support the energy transition in a way that achieves sustainable operations and contribute to a nature positive future, whilst being respectful of planetary boundaries.

#### How we deliver is as important as what we deliver

#### **Pillars**

#### Goals

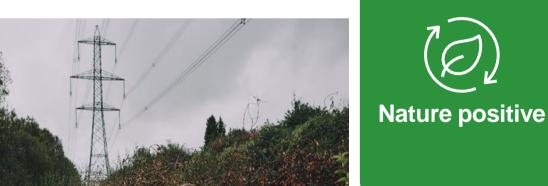
#### **Metrics**

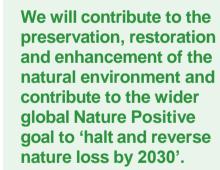
#### **Delivering in London**



We will achieve net zero by 2050, ensuring alignment to climate science and industry best practice to avoid the worst effects of climate change on people and the planet.

- 50% reduction in scopes 1 and 2 emissions from 2018/19 baseline;
- 50% reduction in SF6 emissions by 2030 from a 2018/19 baseline;
- 20% substation energy efficiency improvement from a 2022/23 baseline;
- Purchase 100% zero emission vehicles for our light-duty fleet;
- Deliver our construction projects as low carbon intensity as possible;
- Achieve net zero emissions for our corporate property office estate.





- Deliver at least 10% or greater Biodiversity Net Gain (or equivalent in Wales) plus wider environmental and societal benefits.
- Advance understanding in the development and delivery of effective marine restoration and enhancement;
- Work with grantors to deliver nature connectivity.
- Disclose our material nature-related risks and opportunities.





We will operate within the limits of our planet by seeking to eliminate pollution and restrict the use of finite resources. so that humanity can continue to develop and thrive for generations to come.

- Improve our circular economy maturity levels and aim to be in the 'engaged' level in BS8001 circular economy standard;
- Deliver zero avoidable waste in construction
- Requirements for 10% recycled / reused content in key construction materials.

#### Case study

**London Power Tunnels 2** 

LPT2 is a £1 billion project, to rewire South London via deep underground tunnels.

The project has embedded carbon management from the start. By optimising design, switching to lower-carbon material, and improving the way we deliver, we've achieved an 18% reduction on emissions from our baseline, a saving of 18,867 tCO2e across our tunnel and shafts works.

In April 2023, the world's largest pour of sustainable, cement-free concrete was used to fill the base of a 55m-deep tunnel shaft.

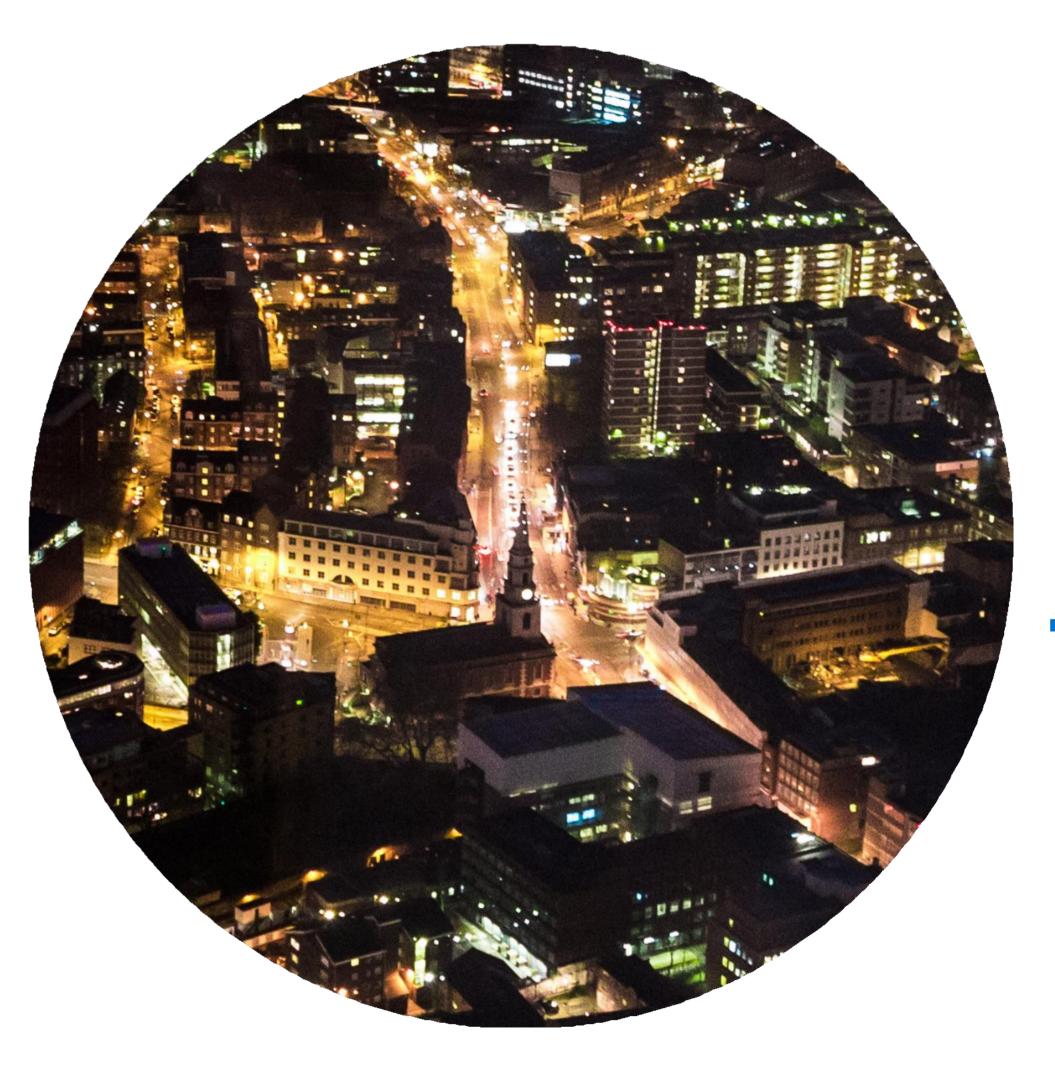
Tunnel construction is well underway, with the project due to be complete and fully operational in 2027.



The earth-friendly concrete pour at Hurst Substation was the largest continuous cement-free concrete pour in the world.



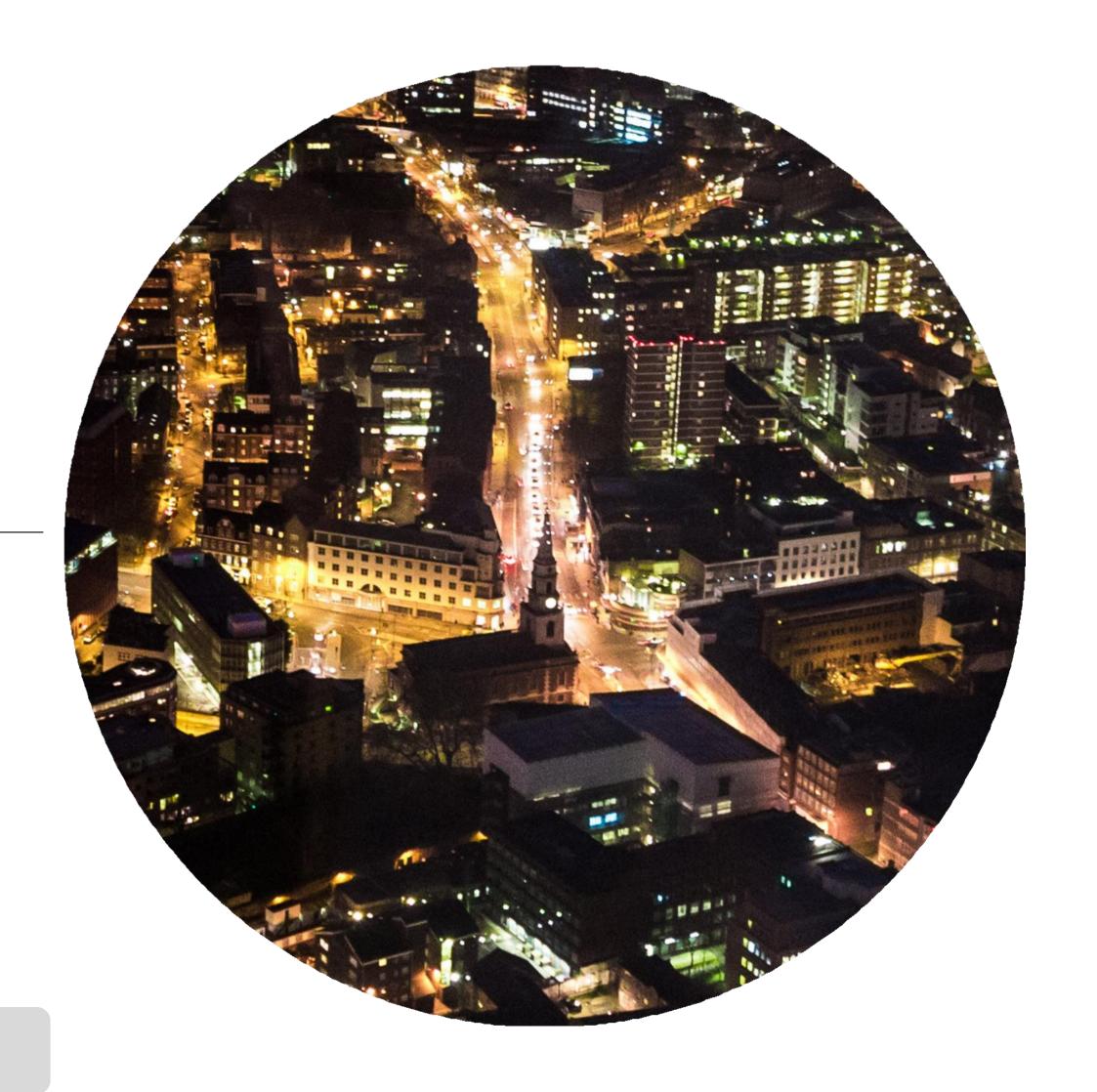




# Update from the DNOs

# Update from Scottish and Southern Electricity Networks

Andy Wainwright
Whole System Manager







### THE SSEN STRATEGIC PLANNING PROCESS

Making decisions today in light of long-term and whole system needs.

**Forecasting** needs



Create strategic plan ()

STRATEGIC DEVELOPMENT

**ANS METHODOLOGY** 



NORTH HYDE GRID SUPPLY POINT: STRATEGIC

Develop detailed options

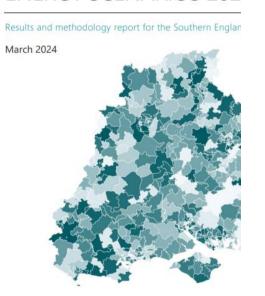


Deliver projects



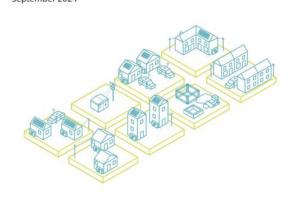


SSEN DISTRIBUTION FUTURE **ENERGY SCENARIOS 202** 



JUST TRANSITION, **VULNERABILITY AND FUTURE ENERGY SCENARIOS** 

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### NORTH HYDE GSP EXAMPLE

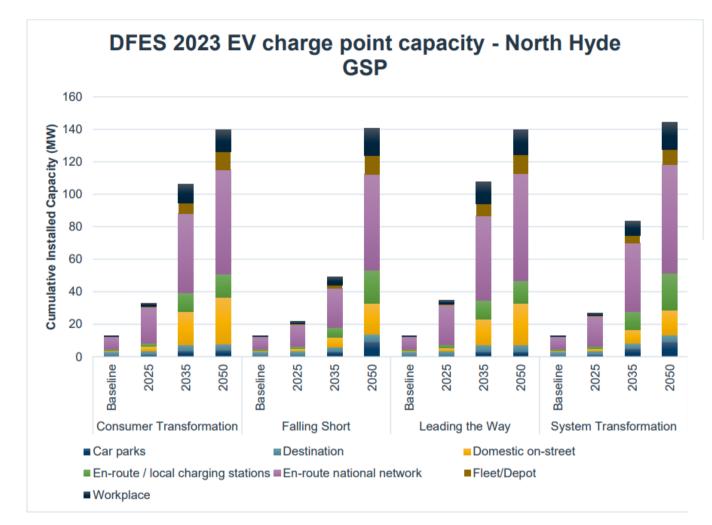
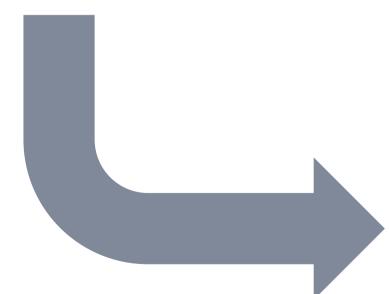


Figure 8 Projected EV charge point capacity across North Hyde GSP. Source: SSEN DFES 2023



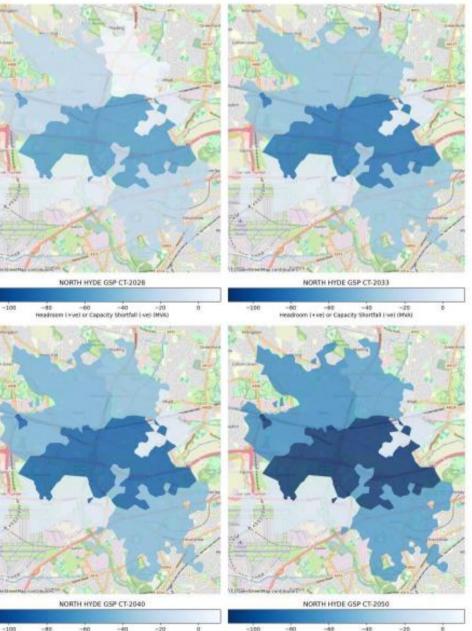
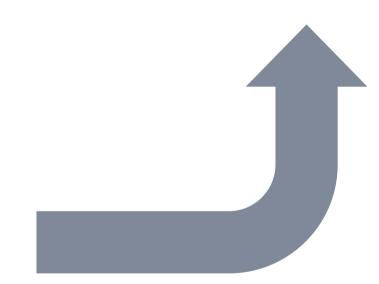


Figure 12 North Hyde GSP - EHV/HV Spatial Plans - Consumer Transformation

#### **DNOA Outcome Report**



thern Electricity Networks Distribution | DNOA Outcomes Report July 2024

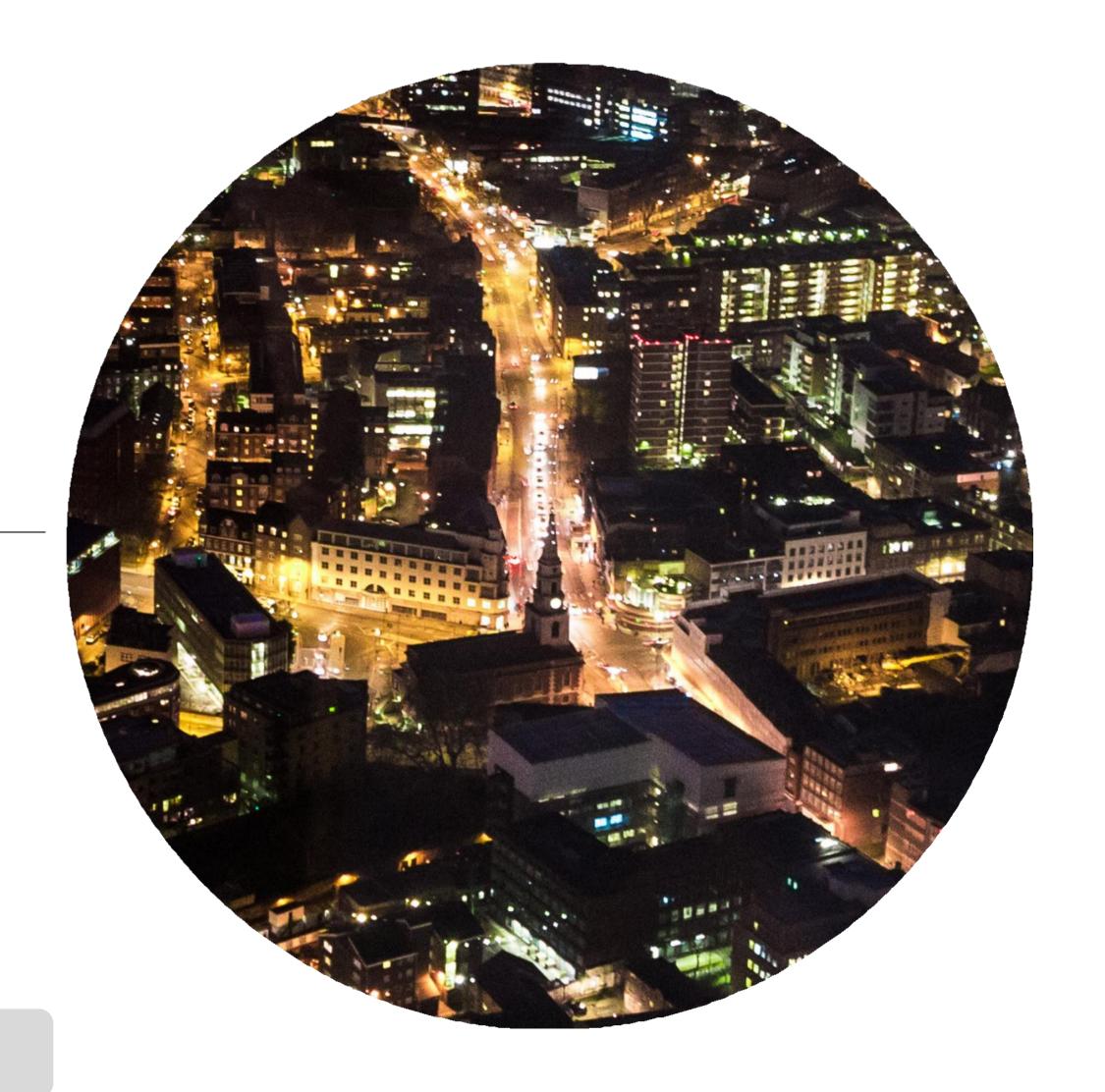


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# Update from UK Power Networks

### **Leon Ford**

# Regional Planning Manager



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### **UK Power Networks**

An Employer of Choice

**London Power Networks** 

A Respected and Trusted Corporate Citizen

Sustainably Cost Efficient Enabling the Net Zero Transition For All

#### **UK Power Networks in numbers**

We operate across three licence areas: London, the South East and East of England. We also deliver networks through our unregulated business, UK Power Networks Services.

13,150 MW

Peak demand

189,822 km

Total length of overhead (45,437 km) and underground (144,385 km) network 9.82 GW

Distributed generation on our network

73,746 GWh

Electricity distributed – 28% of Great Britain's total electricity distribution Our future network priorities

Facilitate cheaper and quicker connections using proven innovation

Collaborate with industry and others in Great Britain to enable nationwide benefits

Facilitate the uptake of Low Carbon
Technologies (LCTs), such as electric vehicles
(EVs) and heat pumps

Create Distribution System Operator capabilities

Use customer flexibility as an alternative to network upgrades

South Eastern Power Networks

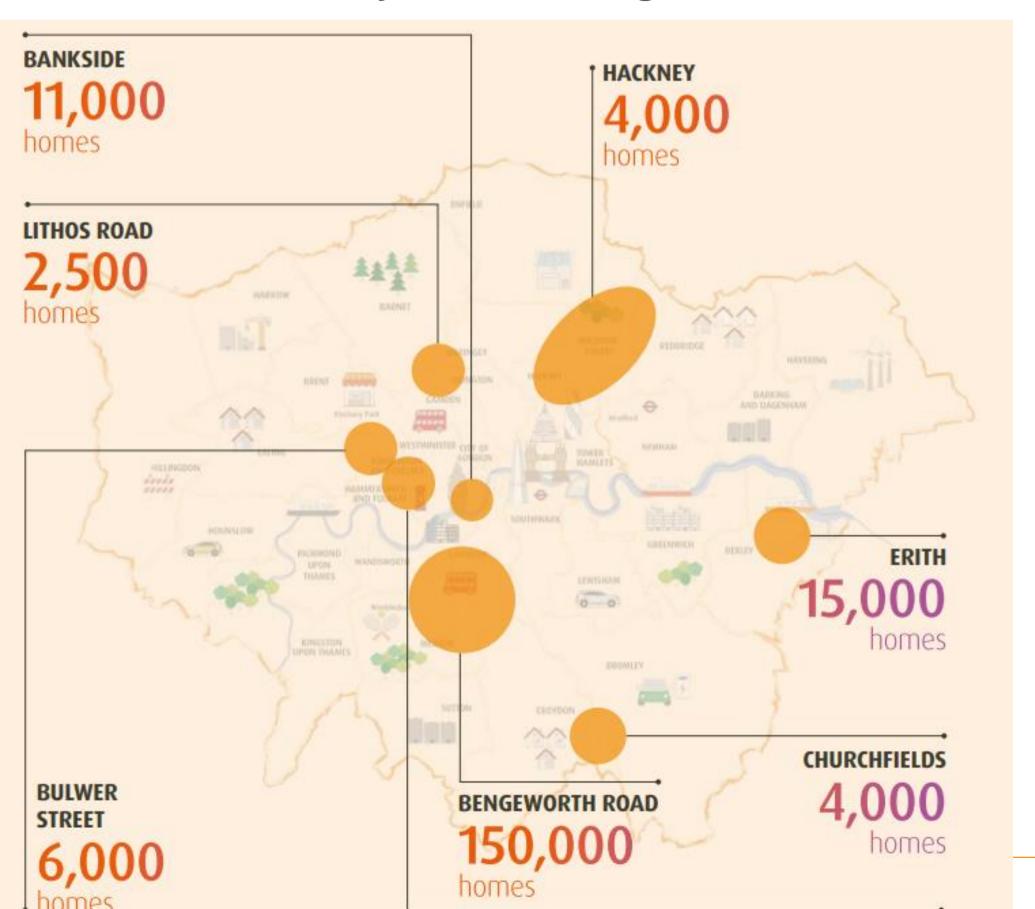
**Eastern Power Networks** 



Placing customers and communities at the heart of Net Zero

# Regional Focus

Our RIIO:ED2 priorities are to ensure we provide the highest level of customer service by maintaining network reliability and ensuring London has sufficient capacity to grow. We achieve this by;



Local Engagement

- Working with Local Authorities to understand energy usage and development.
- 'Local Net Zero Hub'

Forecast Modelling

- Creating and developing a detailed forecasting model for London.
- Sharing our forecasts and being open about our view of decarbonisation and growth.

Targeted Delivery

- Flexibility first approach to demand needs.
- Targeted delivery of infrastructure in line with community needs.



# **Examples of Work Underway**

Local Area Energy Planning

Working with Local Authorities and the wider energy industry to achieve Net-Zero.

Decarbonising Transport

Enabling electrification of public transport by utilising flexibility in the connection arrangements.

Domestic Service Interventions

Upgrading our network to enable domestic customers to decarbonise.

Enabling 'natural' decarbonisation

We are preparing our network to cope with the natural load growth we forecast to 2050.

Connecting Customers

Enabling growth and regeneration of London through strategic investment based on customer schemes.











# Introduction to the NESO

# NESO update on Strategic Energy Planning (SEP)

January 2025

## Martin Speke – RESP Implementation Analyst – London

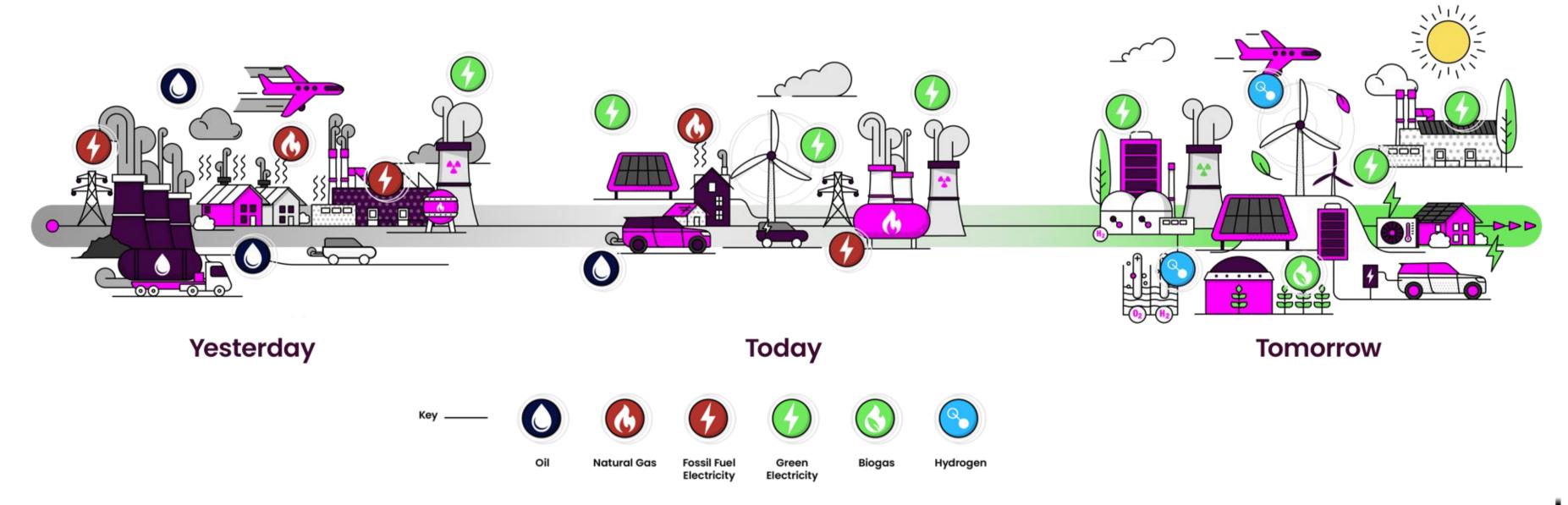
Regional Energy Strategic Planning National Energy System Operator





# A changing energy landscape

- The energy system is critical to almost all aspects of our daily lives and fundamental to decarbonising the economy.
- The way we use, store and source energy is significantly changing and we have an opportunity in this period of change to shape an energy system that fosters economic growth and prosperity for Great Britain, creating jobs and building skills.
- This valuable opportunity will help protect the environment for current and future generations and ensure energy is affordable for everyone.





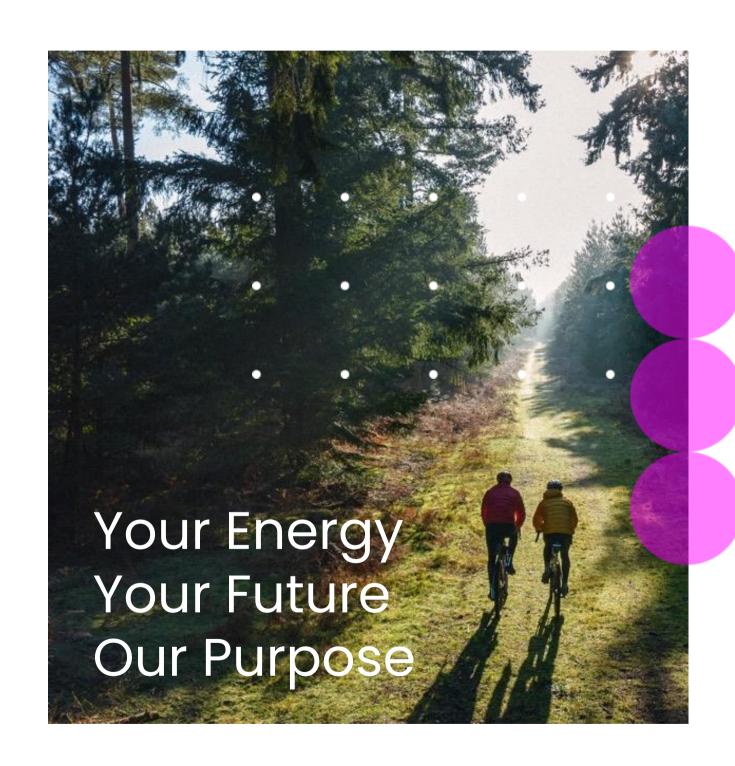


## 1. National Energy System Operator overview

#### Who we are:

The National Energy System Operator, NESO, is an independent, public corporation at the centre of the energy system taking a whole system view to create a world where everyone has access to reliable, clean and affordable energy.

Our work will be the catalyst for change across the global community, forging the path to a sustainable future for everyone.





## Our Purpose, Vision And Values



Our purpose is to forge the path to a sustainable future for everyone.



Our vision is a future where everyone has access to reliable, clean and affordable energy; our work will be a catalyst for change across the global community.

Our values are what define us, setting the foundation for our purpose and guiding us as we move towards achieving our vision.



Accelerate Progress
We deliver better
outcomes at pace when
we take accountability,
are courageous and
progress the bigger
picture.



Be Curious
We achieve more when
we demonstrate a
growth mindset, being
curious, asking questions
beyond and within our
organisation to develop,
learn and innovate.



Build Trust
We build trust when we
listen to and understand
the needs of our colleagues
and customers, are
transparent with our actions
and deliver on our
commitments.



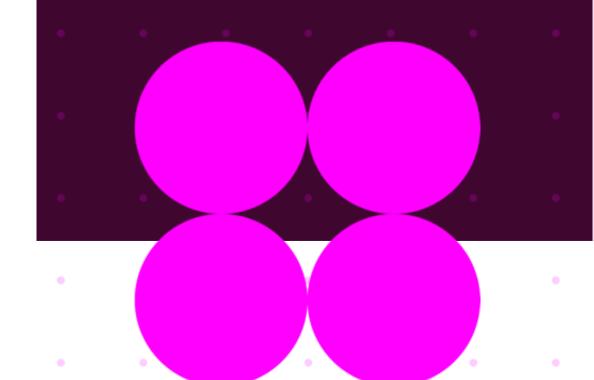
Create Belonging
We perform at our best
when we can be our true
selves, embrace diversity
and are truly inclusive.



## Our Governance

NESO is operationally independent of government. We plan the electricity and gas systems and operate the electricity system.

Being independent means we can give impartial recommendations to the government and the regulator.



Our shareholder



The Department for Energy Security & Net Zero is responsible for national policy and providing strategic direction and targets in relation to UK energy

Our regulator



Ofgem is the energy regulator for Great Britain

## Independent NESO Board

The NESO Board oversees our strategic direction, ensuring compliance with regulations and mitigation of corporate risks.

The Board ensures that we build strong relationships with customers and it evaluates performance.

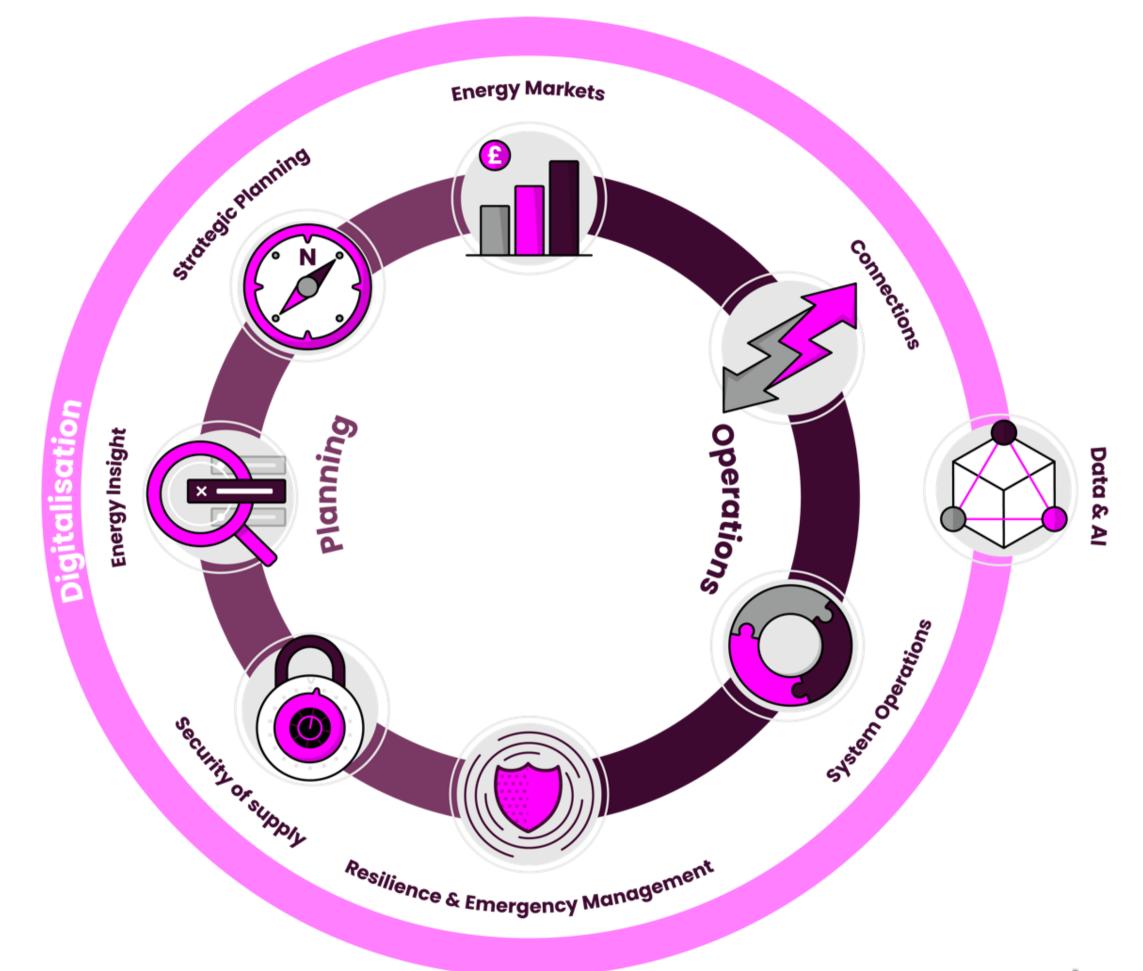


## What we do:

We bring together eight activities required to deliver the plans, markets and operations of the energy system of today and the future.

Bringing these activities together in one organisation encourages holistic thinking on the most cost-efficient and sustainable solutions to the needs of our customers.

https://www.neso.energy/whatwe-do





## 2. Strategic Energy Planning (SEP) overview

Pre 2030 Post 2030

#### **CP2030**

Advise government on which network upgrades, market and policy decisions could accelerate the development of a clean power electricity system by 2030.



UK Government response to CP30 advice to be published by end of 2024 Adopted Clean Power
2030 advice by
Government feeds into
the background
assumptions
underpinning all three
Strategic Plans.

Supply and demand projections from Future Energy Scenarios (FES)



DESNZ data inputs and assumptions

**SSEP** 

Spatially maps out the energy assets necessary to meet 2050. Focus on optimisation of cost, environment, community impact.





Environmental, societal and technical perspectives

#### **CSNP**

Whole system plan for the development and assessment of high-level investment options for transmission networks.



Long term feedback loop



#### **RESP**

Focus on developing whole system, cross-vector regional plans with input from local actors.



## Strategic Spatial Energy Plan (SSEP) overview

## Accelerate clean, affordable, secure energy through certainty

The SSEP will accelerate and optimise Great Britain's transition to clean, affordable and secure energy by taking a holistic approach and providing greater certainty for key stakeholders.

## Zonal approach, taking account of environment and communities

Splitting Great Britain's energy system into zones to assess the optimal locations for electricity generation and storage of electricity and hydrogen.

Options identified using economic, environmental and technical input, with considerable societal, stakeholder and political engagement planned.

SSEP will not focus on specific projects, leaving the energy market or subsequent processes to determine the specific projects and exact locations.



## **CSNP** framework

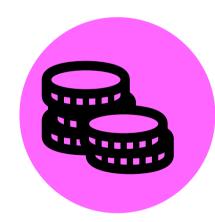
### **Our vision**

Provide an **independent, coordinated, and longer-term approach to wider network planning** in GB to help meet the government's net zero ambitions

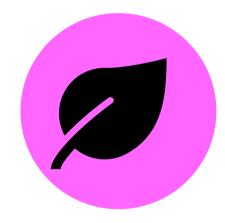
Provides a network blueprint for the country, mapping demand and optimal locations for onshore and offshore transmission infrastructure to support a decarbonised energy grid.



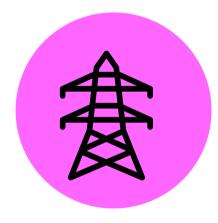
25-year horizon, on a three-year cycle



Co-ordinate reinforcements and anticipate investments ahead of infrastructure delivery



Balance development against environment/community impacts to maximise benefits



Understand transmission infrastructure needed for onshore/offshore electricity transmission and interconnectors **NESC** 

## Regional Energy Strategic Plans (RESP)

#### Why?

To achieve local and national net zero targets we need:

- 1. To accelerate electricity network investment enable heat & transport decarbonisation
- Consistency same approach for all network companies
- Whole system joined-up plan for all aspects of energy system

### Where? (proposed)



## Who? (proposed)

Ofgem – defining role

NESO – delivering role

Strategic Boards & Working Groups

#### **Local authorities:**

England: CAs, CCs, unitaries Scotland & Wales: unitaries

**Networks:** DNOs & GDNs

Other local actors: relevant to energy system & spatial planning

NESO

National Energy System Operator

## **Draft RESP Outputs**

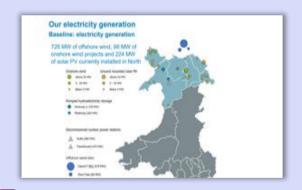
Ofgem have outlined 3 building blocks that the NESO RESP must deliver. So far, we have identified **6 key outputs** that will enable the NESO RESP Team to deliver credible whole energy regional plans. These outputs will be refined and validated when developing the RESP Methodology.

### The Regional Energy Strategic Plans

The RESPs will develop future energy pathways and hotspots where strategic investment need is likely to arise to meet the regional energy visions

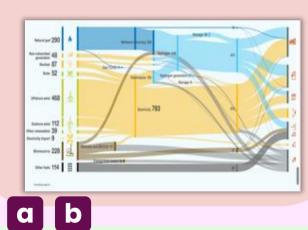
#### **Regional Energy Vision**

**RESP** will enable distinct Regional Energy Visions, reflecting local needs, to collectively support national objectives



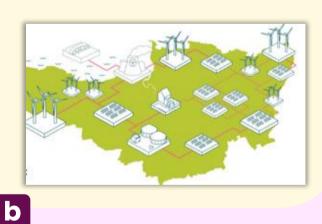
#### **Regional Pathways**

**RESP will create Regional** Pathways built from bottomup that are coherent with national needs. NESO will also develop consistent planning assumptions



#### **Spatial System Need**

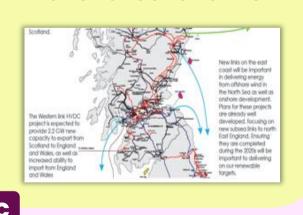
RESP will identify strategic investment needs as well as spatial cross-vector system needs, resulting from the pathways considering network constraints



### **Support for price** controls

#### **Network plan Technical** coordination

RESP will assure that regional network investment plans are integrated across vectors, built on consistent assumptions and deliver regional needs at pace, within national constraints



#### Societal **Impact Assessment**

The RESP Team will review the societal impact at a local level of the energy transition (including jobs, transport, industry, environment etc.



#### **Regional Geospatial Energy Plan**

RESP Team will develop geospatial regional plans that provide transparency and visibility to local communities and national stakeholders. The RESP Team will continue to track and monitor the delivery of the RESPs including Strategic Investments.

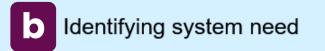


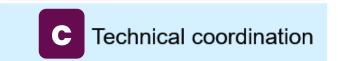






Modelling supply and demand

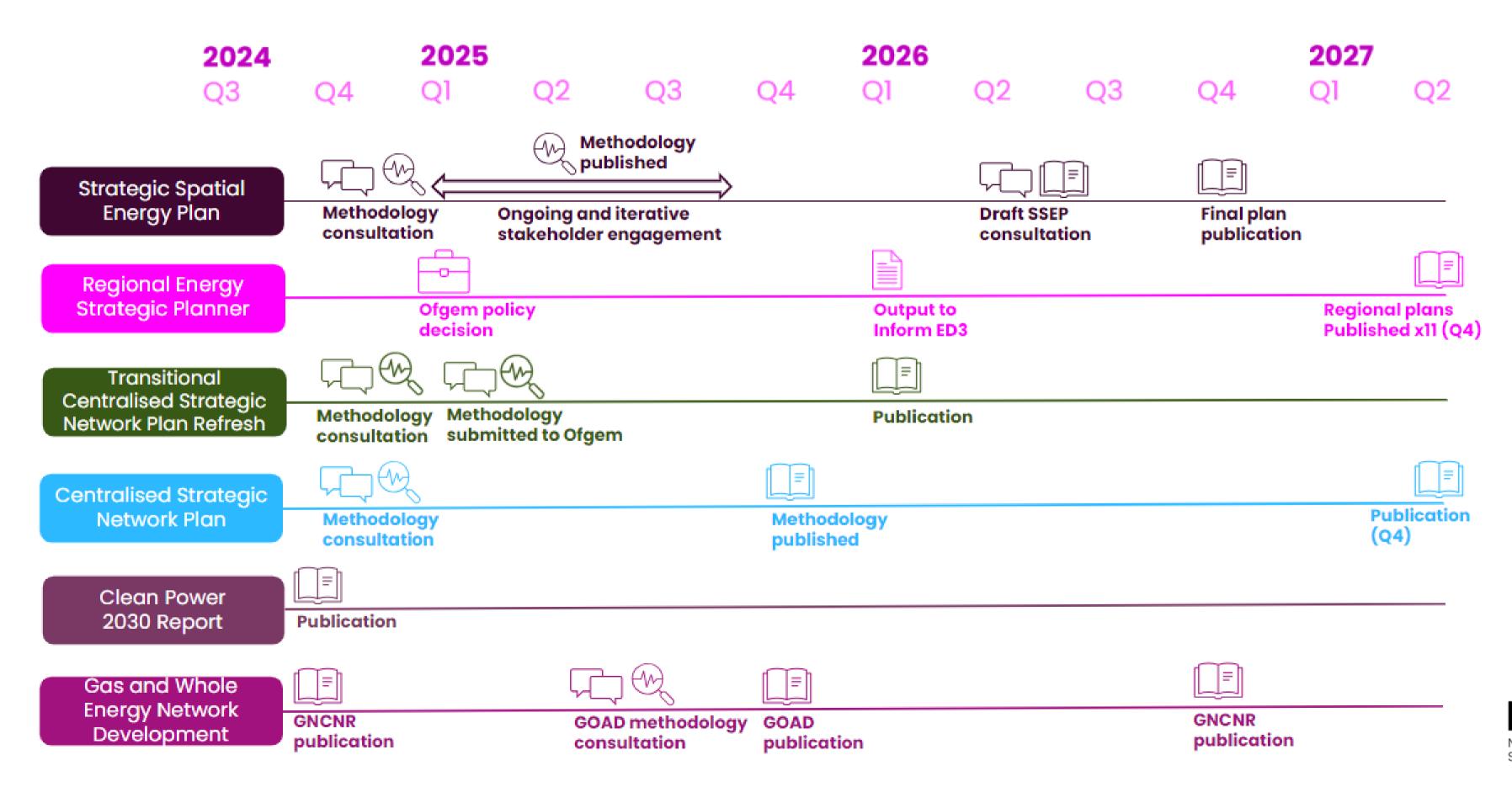






## 3. Next steps - High level milestones\*

\*These are indicative dates and subject to change.

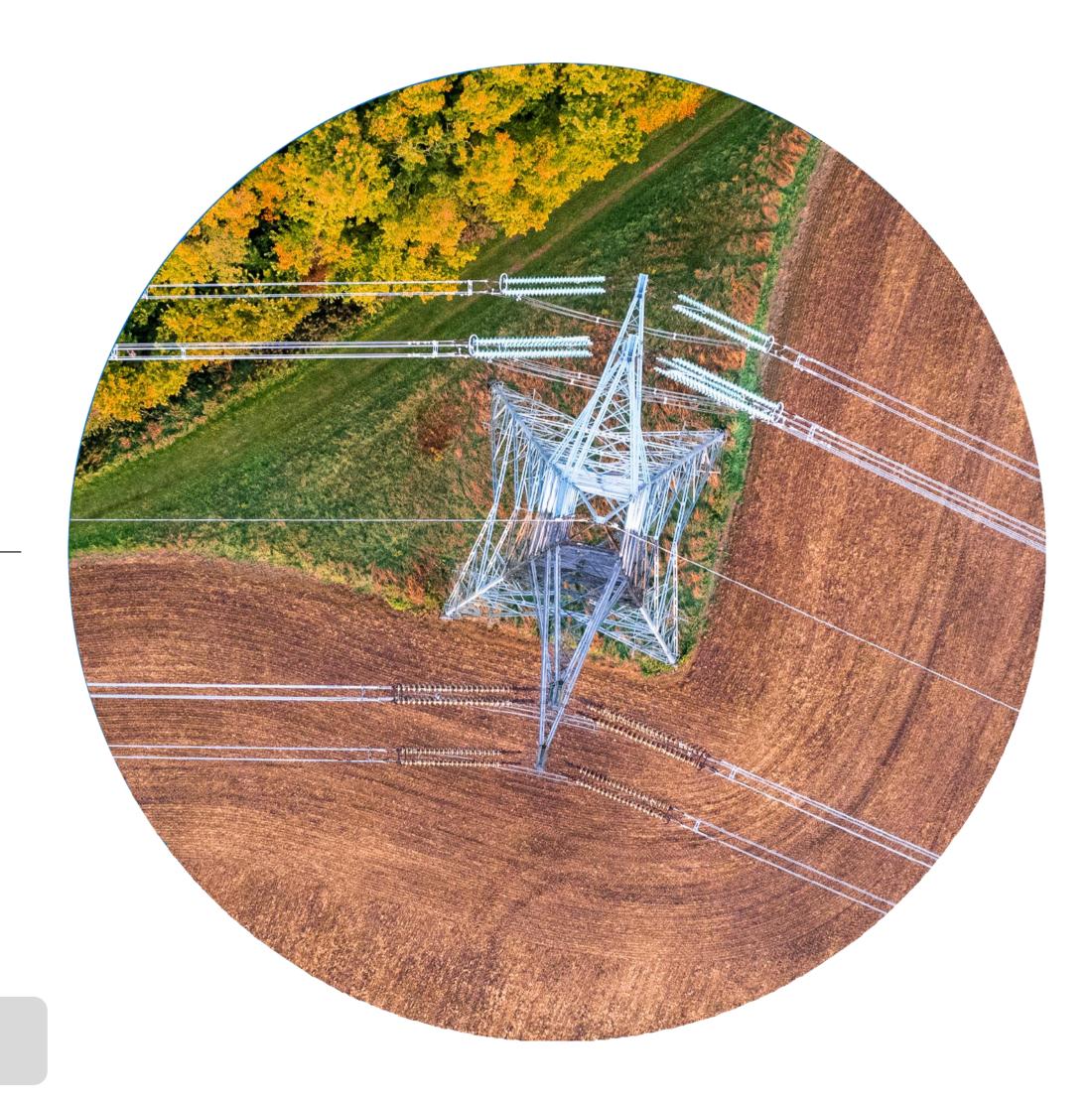






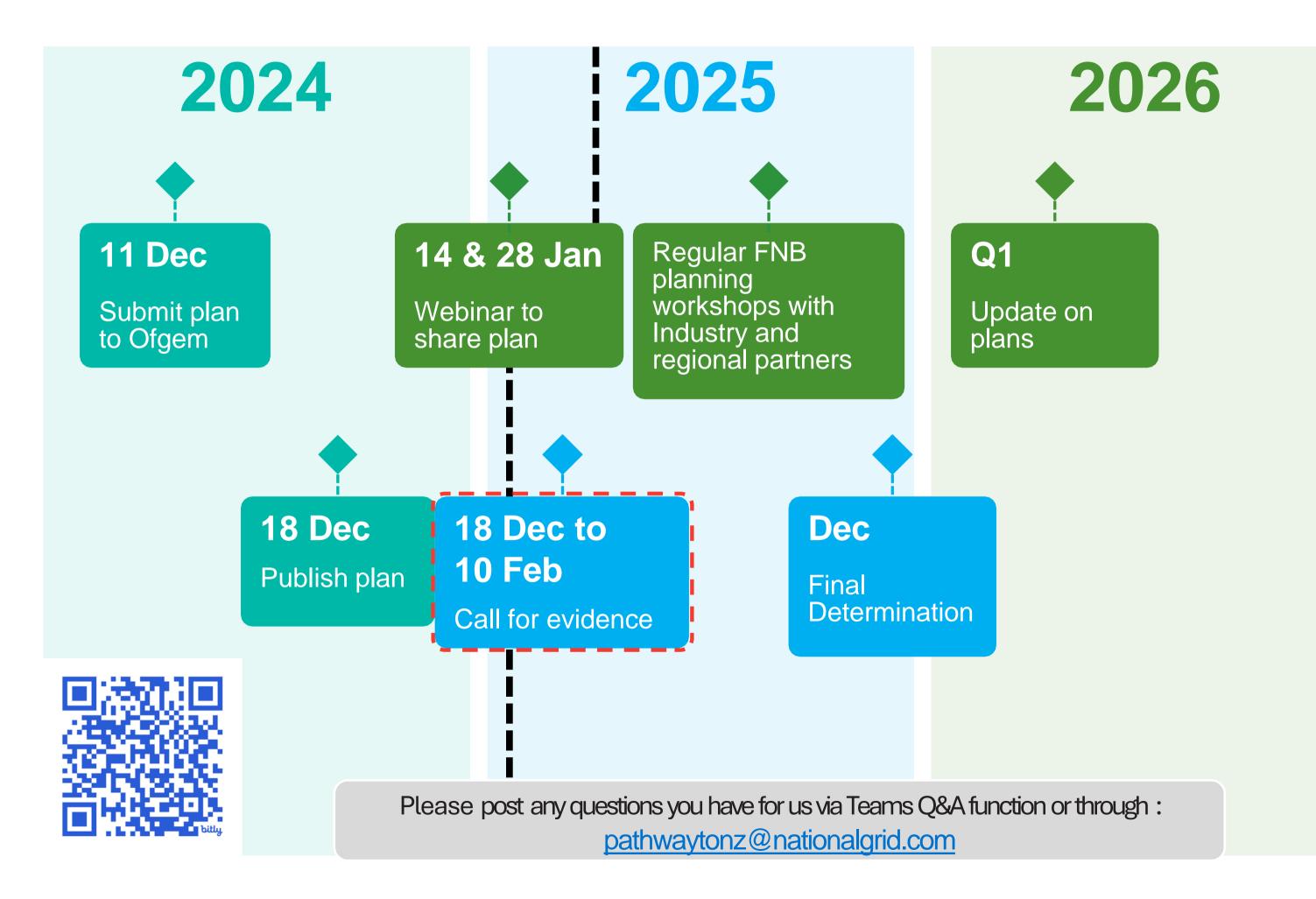


## Timeline



Please post any questions you have for us via Teams Q&A function or through: <a href="mailto:pathwaytonz@nationalgrid.com">pathwaytonz@nationalgrid.com</a>

## Planning next steps for London



Ofgem's Call for Evidence 18 December to 10 February

All responses welcomed

Your response will help to inform Ofgem's Final Determinations.

Please send your response to RIIO3@ ofgem.gov.uk

More information at Ofgem Call for Evidence RIIO-3

# Q&A

Please post any questions you have for us via Teams Q&A function or through:

pathwaytonz@nationalgrid.com



We welcome your feedback on what you have heard today, our FNB process and how we can work better together?

Please get in touch via pathwaytonz@nationalgrid.com



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## Our approach to local engagement

We consult and work with local residents, their representatives and statutory stakeholders through all stages of the planning and construction process.

Our approach is underpinned by the 5Cs:

- Communities play a vital role and should see the benefits from hosting new infrastructure.
- We undertake the highest standards of consultation.
- We identify and **collaborate** with partners to deliver tangible community benefits.
- Our communications campaigns will clearly explain the need for a reliable decarbonised grid, and greater energy security for Britain.
- Our **colleagues** are experts in the energy sector, land, planning and the environment.

## How we engage with local communities

We consult and work with local residents and their representatives through all stages of the planning and construction process.

- Consultation and information events
- Stakeholder briefings
- Public webinars
- Community newsletters
- Dedicated e-mail and phone services
- Project websites



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