Electricity Transmission

The connections challenge and reform

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National Grid Electricity Transmission

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National Grid businesses

Electricity Transmission and Strategic Infrastructure (ET & SI)

Electricity Distribution (ED)
•(previously WPD)

New York New England National Grid

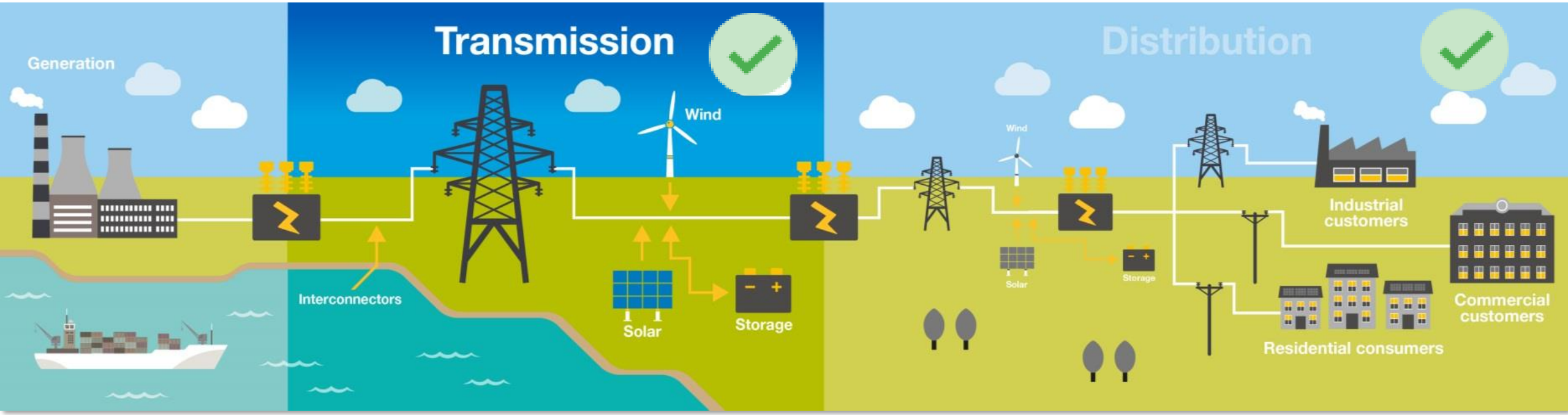
Partners

National Grid Ventures

Electricity System Operator ESO) (*to be divested*)

•**National Grid**

The role we play in delivering energy



Electricity Generation

Transmission Owners

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Scottish & Southern Electricity Networks TRANSMISSION

SP ENERGY NETWORKS

Distribution Network Operators

Examples:

NORTHERN POWERGRID

UK Power Networks Delivering your electricity

Scottish & Southern Electricity Networks

electricity north west

Northern Ireland Electricity Networks

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Examples of iDNOs:

gtc

eclipse power networks

UK Power Distribution

ENERGY assets

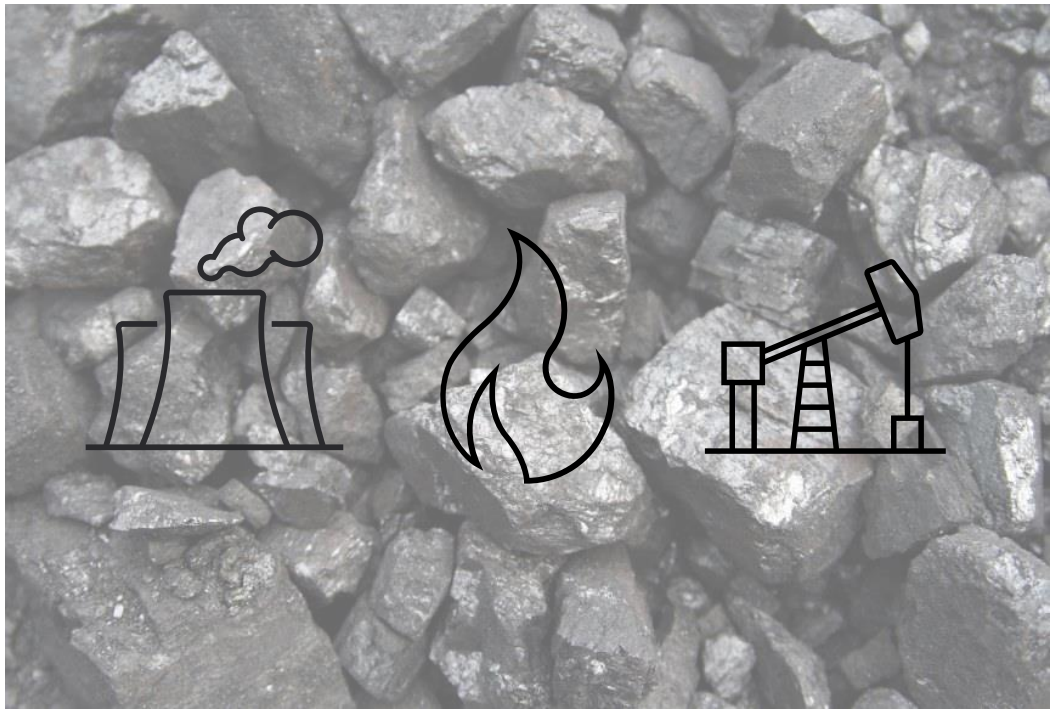
Networks/Complements

nationalgridESO

ofgem

Department for Energy Security & Net Zero

Our customers are changing



A 1960's view

Enabling the energy transition

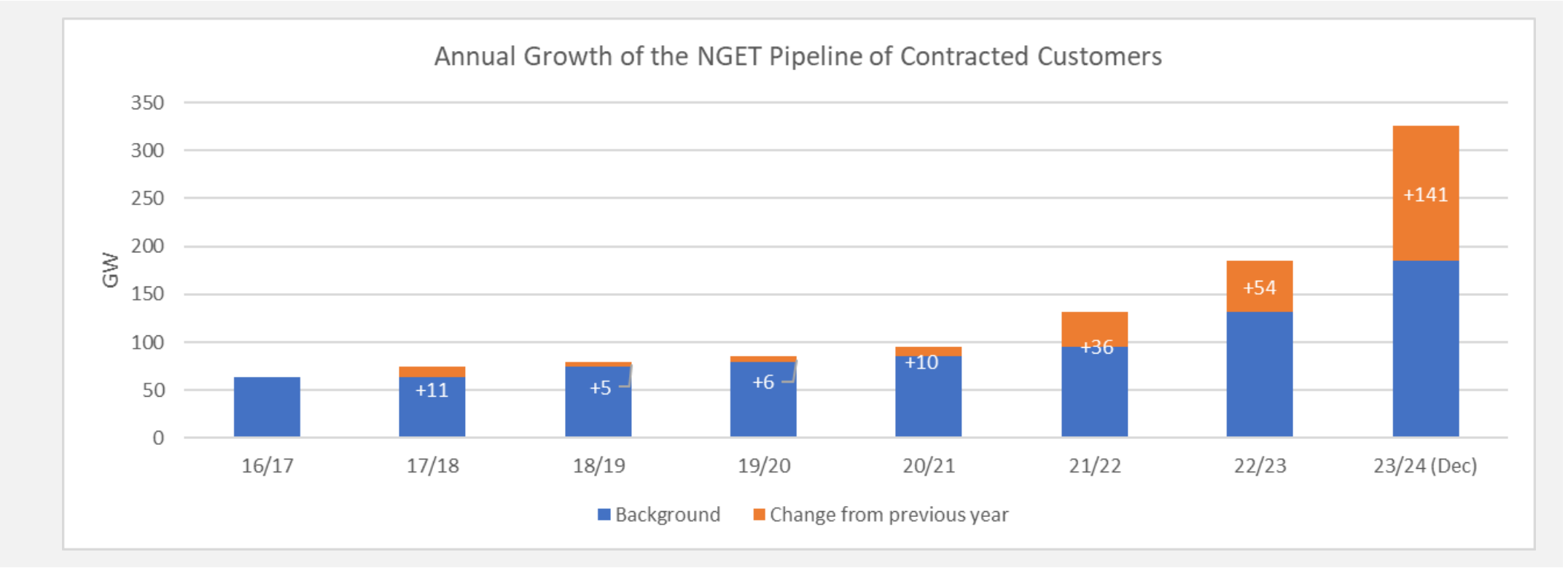
The connection landscape has undergone an extensive transformation in the past 10 years, we have moved from a fossil fuel led energy mix, to clean low carbon generation and innovative demand technologies, all of which require connection to the Transmission or Distribution networks

The pace and scale of change in the connections landscape is vast

We're keeping up with the challenge to connect over 60GW of low-carbon generation by 2035 to meet net-zero targets.

The market has responded to Government targets with significant volume of low-carbon technologies coming forward to connect – and the volume is still increasing!

We have gone from connecting a handful of large-scale developments per year, to managing a **contracted background of over 300GW and over 700 contracts** (for England & Wales alone).



Delivering for 2035

01 Reform the planning system, centred around a strategic clean energy vision	**04 Put communities and consumers at the forefront of the transition**	**03 Transform how clean energy connects to the grid, accelerating net zero projects** • Shift from a 'first come, first served' to 'connect or move' connections process. • Develop strategic 'capacity hubs', enabling a more coordinated and innovative approach to connections. • Create a fast-track connection route for critical net zero projects, prioritising those areas where the economic value could be greatest
02 Ensure the regulatory and governance framework is set up for delivery	**05 Develop supply chain capacity and a skills pipeline across the country**	

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The connections challenge

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The connections challenge can be broken down into three key elements

There is not one problem nor one solution

Market

Customers can **apply when they want**, for what they want and **get allocated capacity** on a **first come first served basis** – resulting in a pipeline of **almost 300GW of generation and demand connections** to the network in England and Wales

Contract

Lack of contractual discipline and authority to effectively manage customer contracts and ensure efficient connections for connecting customers

Physical works

Required network investment is based on a view of those wanting to connect (currently an extreme unlikely reality of almost 300GW – and roughly only 70GW required to connect to meet net zero and 2035 demand)

We have an ambition for future connections that best serves our customers and communities

A collaborate and coordinated approach is needed

Market

The market sends the right signals to customers to **invest in the right place at the right time** to create a **network that is aligned to Government energy strategy**

Sufficient entry requirements ensure only viable projects apply to connect to the network

Contract

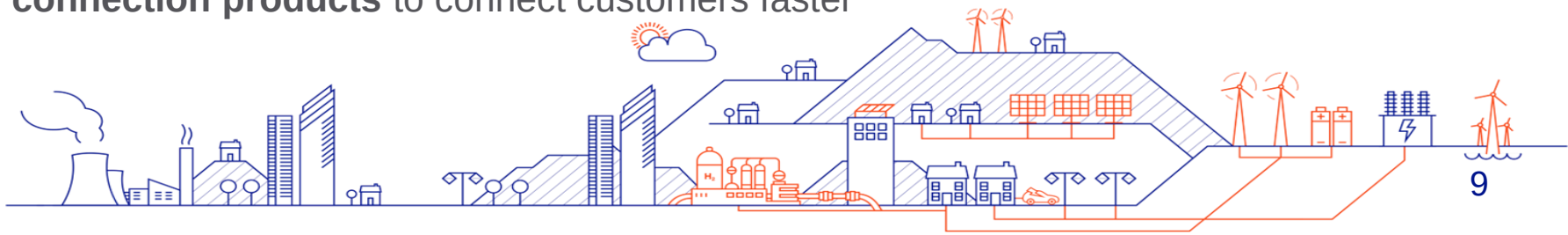
Customers are required to **connect, or move out of the way to allow others to connect**

There is **flexibility in contracts** to enable allocation and reallocation of capacity, enabling efficient connections

Physical works

Network investment is planned and delivered based on strategic view of required connections, creating a **'connection ready' network** for customers

Innovative connection products to connect customers faster



In 2023, we changed the way we treated connections, leading to acceleration of ~50GW of planned connections

ESO's 5-point plan to accelerate connections

1. TEC Amnesty	2. Modelling assumptions	3. Storage	4. Contract terms	5. Interim offer for BESS
Allowing customers to leave the pipeline without penalty	Updating Construction Planning Assumptions when calculating connection dates	Updating assumptions by better understanding storage impact	Introducing Queue Management principles to manage progress	Acceleration of BESS by allowing non-firm connections

We're also working in collaboration with the ENA to change how transmission and distribution networks coordinate connections, improving their interactivity.

Ofgem and DESNZ have set out clear expectations for the direction of reform

Six key areas of action for Government, Ofgem, ESO and network companies

1. Raise entry requirements
2. Remove stalled projects
3. Better utilise existing network capacity
4. Better allocate available network capacity
5. Improve data and processes and sharpen obligations and incentives
6. Develop longer term connections process models aligned with strategic planning and market reform

Ambition for connection dates to be on average no more than 6 months beyond the date requested by the customer

c.150GW accelerated: expected impact through initiatives in flight and completion of plan

Connections Delivery Board established to guide and monitor progress in delivering actions

Industry parties invited to bring forward recommendations to;

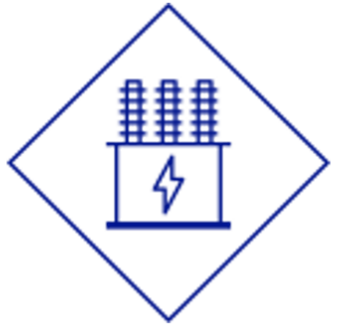
- **Improve certainty and progression of customers holding capacity**
- **Optimise existing network capacity**

Current connections overview.

Recently, National Grid Electricity Transmission has seen a significant volume of customers applying to connect to the electricity transmission network, with an increase of over 250GW in the past year - pushing the total contracted capacity to over 500GW.

- The increased number of connections drives the need for greater network reinforcement - delaying connection dates behind triggered enabling works. The enabling works triggered are further increasing connection dates across the network . Based on historic evidence, the ESO predict that up to two thirds of these projects will never connect.

- NGET is working hard alongside industry to advocate for connections reform. To improve the timescales of connections we must all work to prioritise credible projects and those ready to connect. Crucial progress has been made through the implementation of Queue Management, the Letter of Authority requirements, and the proposal for a new connections process by the ESO in 2025.



- We will continue to work for significant changes, and to deliver a network which is reliable, efficient and ready for the future.

2024 will be a year of change in electricity connections

Including…

Introducing a Letter of Authority for landowners – raising barriers to entry

Queue Management principles

Implementation of a new connections process

- **Application windows for developers**
- **A gated process to manage progression**
- **Tighter rules around modifying contracts**

But… with a constantly growing pipeline does more need to be done?

The Great Grid Upgrade

The Great Grid Upgrade

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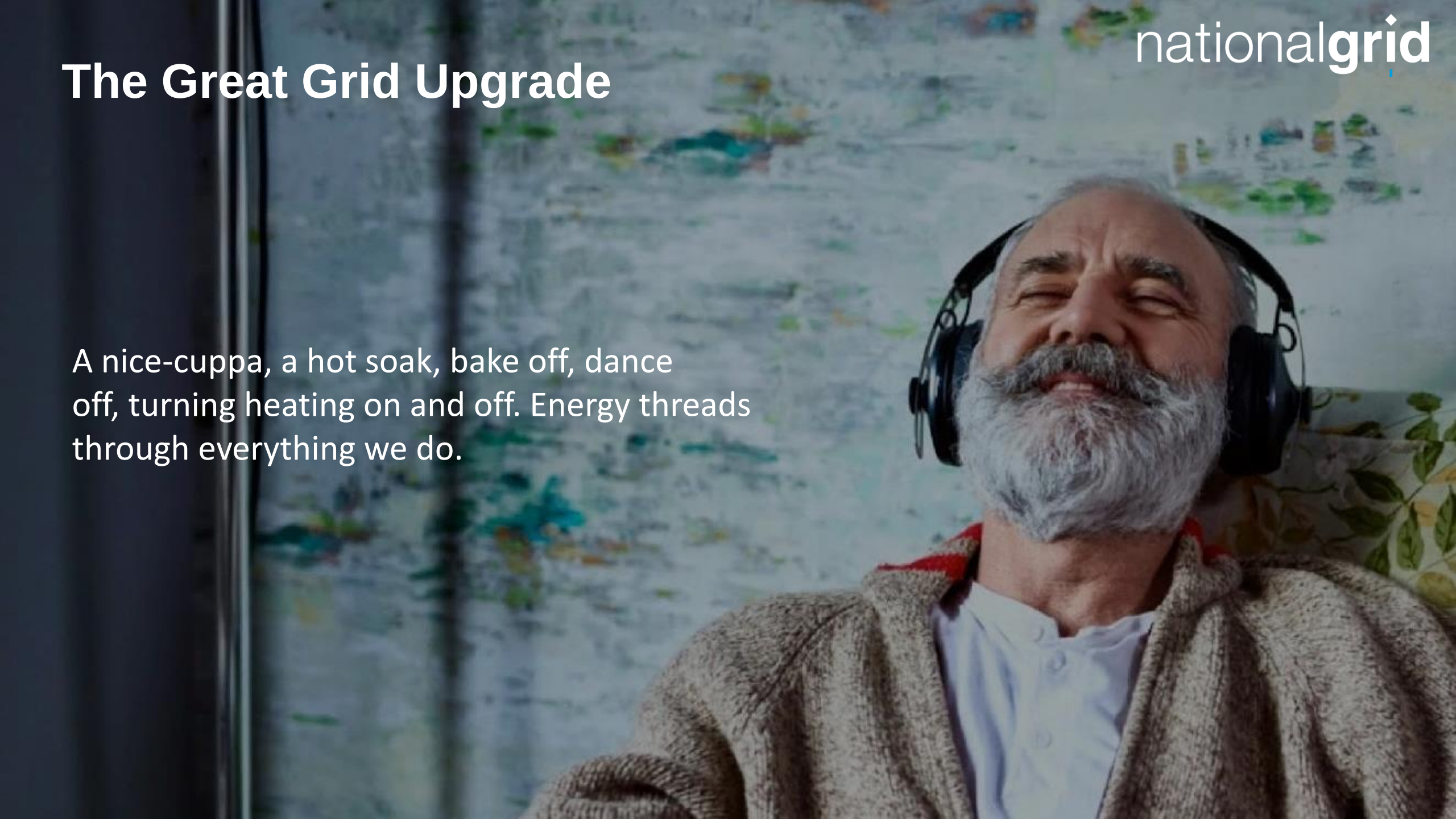

A nice-cuppa, a hot soak, bake off, dance off, turning heating on and off. Energy threads through everything we do.

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Lancashire County Council

Regional Update

Tariq Ajumal
Regional Connections Manager

25/04/24

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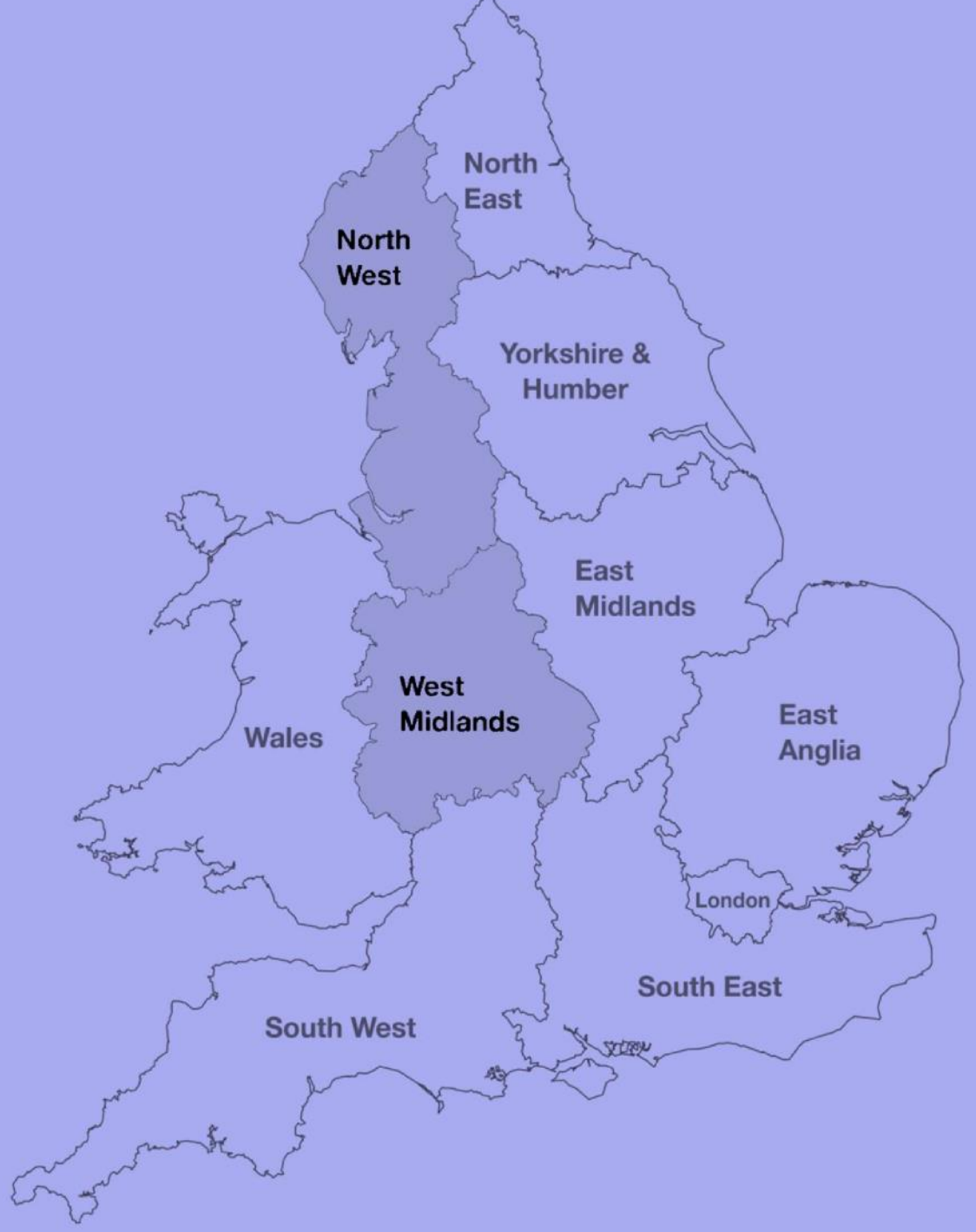
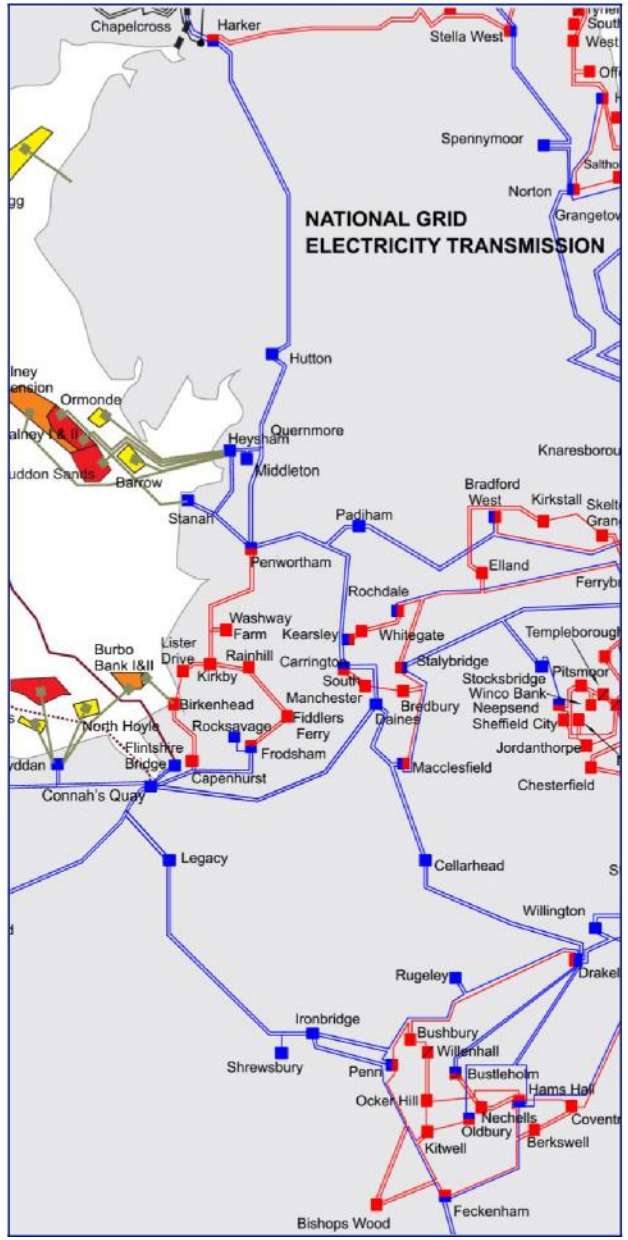


Northwest & West Midlands

•Dates each Combined Authority aims to meet 100% of its electricity needs from renewable sources: Greater Manchester 2038, Liverpool 2040, West Midlands 2041



The network in Northwest & West Midlands

- Northwest and West Midlands transmission network is ranging from Cumbria and the Scottish border to Wales in the west, extending to Staffordshire in the South and Yorkshire & Derbyshire to the east
- The transmission network within Northwest of England consists of 400kV substations. This region is characterised as **net exporter of electricity**
- The Mersey Ring and Greater Manchester consist of 275kV networks and are characterised as **net importers of power** due heavy demands together with a lack of generation
- The West Midlands' transmission system consists of a 400kV outer ring and 275kV inner ring. The network acts as net **importer of power follows** due to high density of demand.

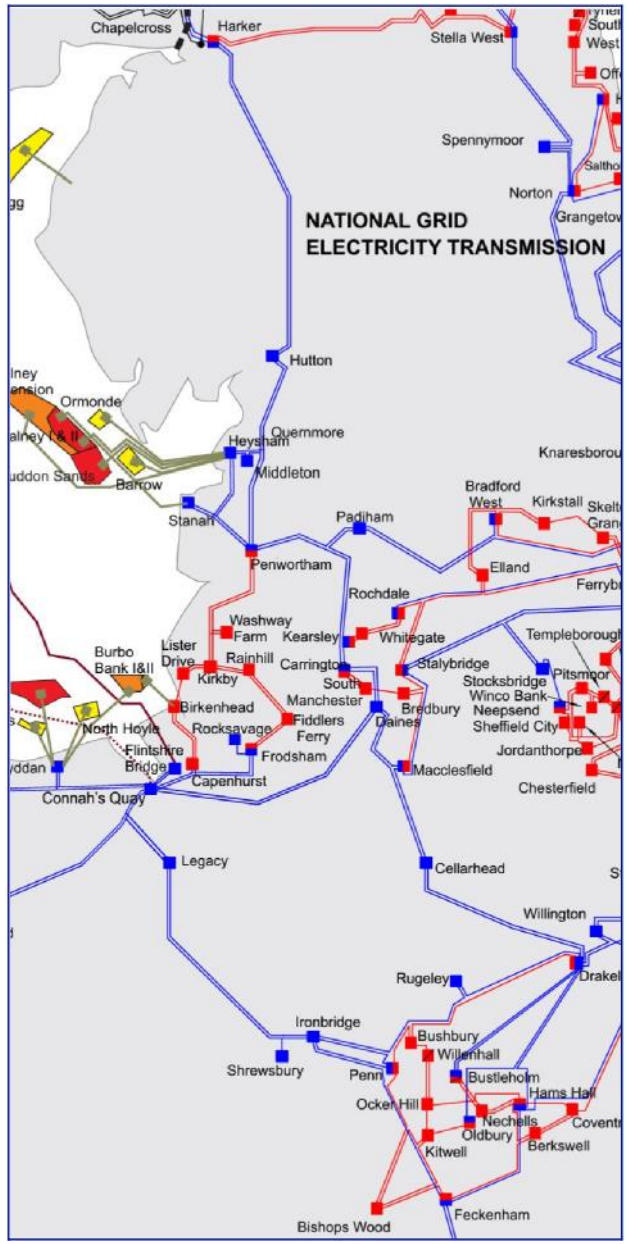
What we are seeing

- Huge amounts of renewable power generated in Scotland of up to **~28GW** flow into northern England. Bottlenecks on the existing network will be experienced around Penwortham in the west.
- Local authorities plan for urban development including housing, EV charging, hydrogen demand and tidal mega Project.

What this means

- More **network upgrades are needed** due to the high volume of power flow from Scotland to deliver low carbon power to the Northwest, West Midlands and beyond.
- We are **reinforcing the existing electricity network** before we build any new infrastructure
- **Strategic upgrades** will still be needed in addition to incremental ones

Northwest & West Midlands



Major Projects under development (examples)

- Harker substation rebuild
- Expansion works at Penwortham and Middleton Substations

Defined network needs with solutions under early development

- South-East Scotland to Northwest England Circuit
- Northwest England and Lancashire New Circuit
- West Coast Anglo Scottish New Circuit
- Northwest England and North Wales offshore link
- Maximising existing and/or increasing capacity of key Northwest and West Midlands circuits
- Improving east-west power transfer to maximise existing north-south network capacity *

Keeping you updated

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