CIGRE

North Sea Collaboration

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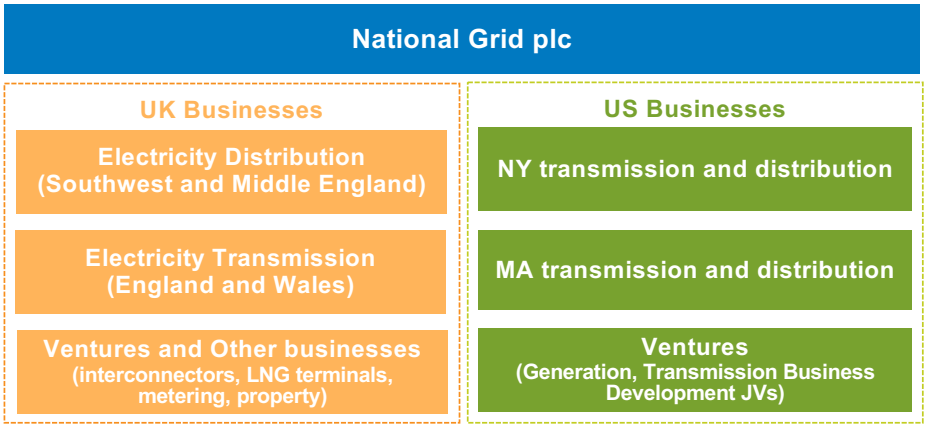
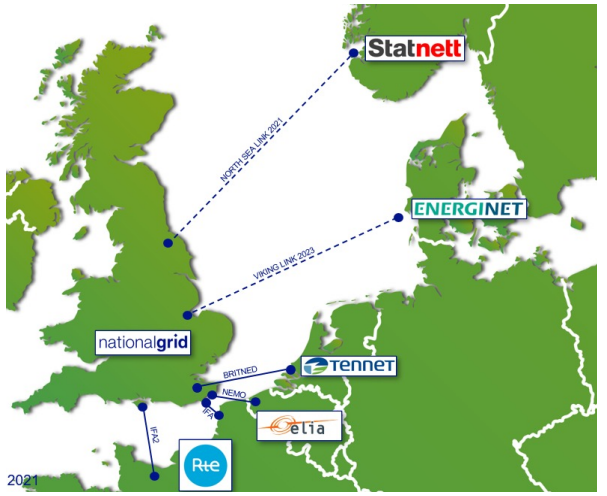
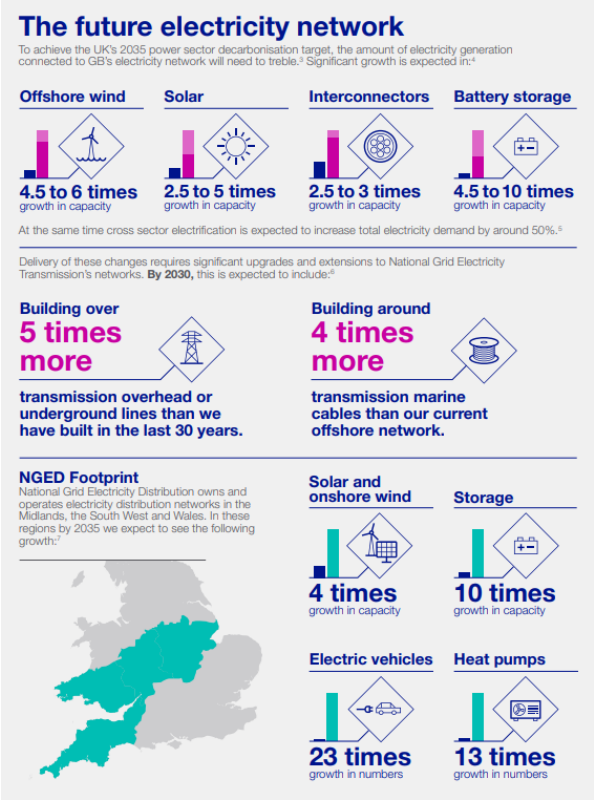
National Grid lies at the heart of a transforming energy system.

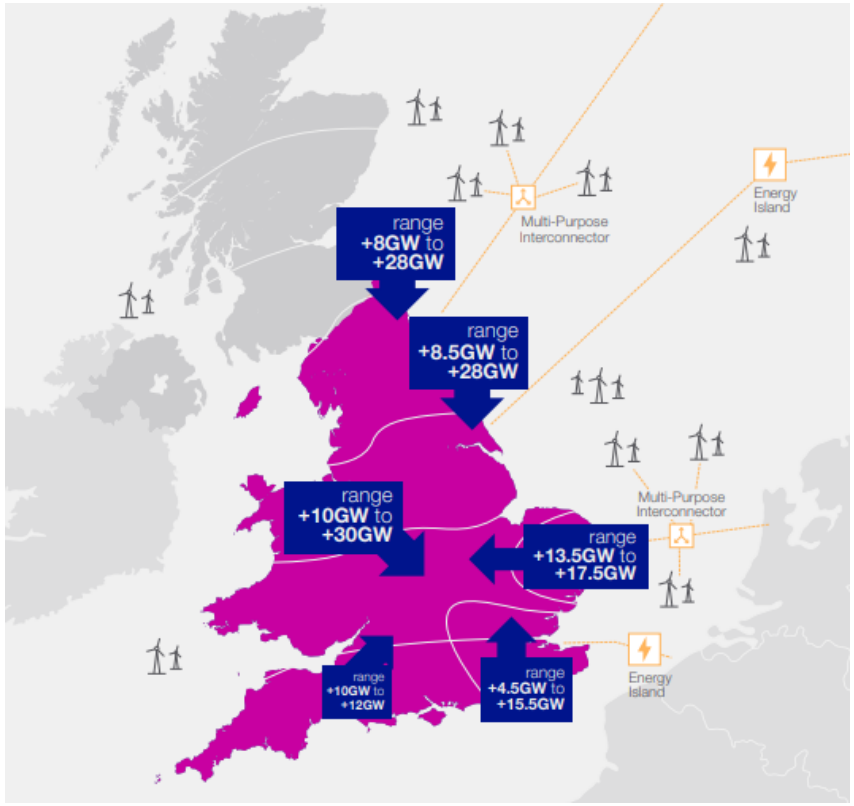
- As one of the largest investor-owned energy companies in the world, National Grid is at the centre of a **clean, fair and affordable** energy future, where tackling climate change and reaching net zero is a key priority.
- National Grid has a critical role to play in the clean energy transition to help reach ambitious clean energy goals while ensuring a resilient and secure energy system.
- National Grid is pioneering ways to decarbonise the energy system; from building interconnectors to connecting offshore wind

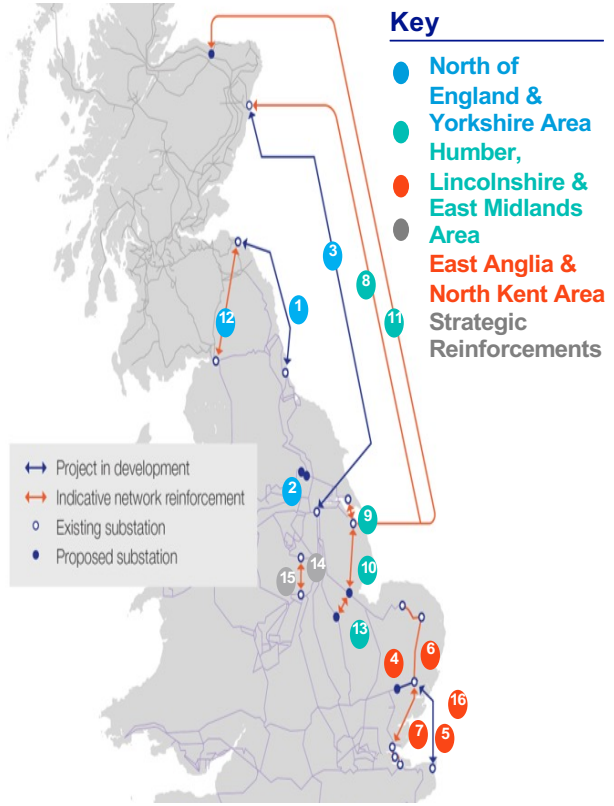




Decarbonising the Power System by 2035: Challenge and opportunity!







We have identified 5 UK priority areas where action is needed to transform the grid.

This action will help us decarbonise the power system by 2035 and cater for an electricity demand increase of up to 50%

Planning Reform	Regulation/ Governance	Connection	Communities/ consumers	Skills and Capability
• Speed up decisions on major infrastructure projects.	• Clarify accountability • Competitive markets to deliver capacity • Embed resilience • Extend anticipatory investment	• Connect or move • Develop capacity hubs • Fast track process	• Roll out demand flexibility • Value for local people who have infrastructure on their doorstep • Work together on local energy plans	• Standardised approach- procurement and technical • Investment and incentive • Training and education to equip the net zero workforce of the future

Innovation and Technology will help us increase the capacity of existing circuits, alongside new Infrastructure build.

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Early Phase/Research

Increasing System Voltage

- Believe 550kV can be delivered using existing tower types and switchgear; look at beyond 550kV and potential implications and solutions to support.

Superconducting Cables

- Considering the potential to deploy High Temperature Superconductor cables, considering challenges in deployment and the opportunity to standardise designs and installation techniques.

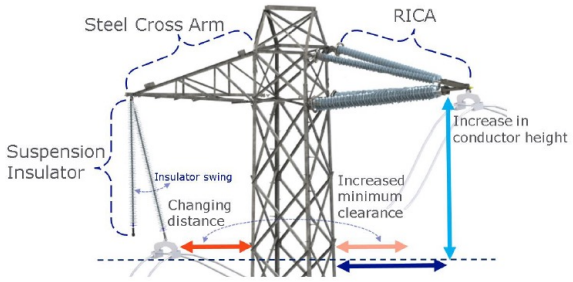
Clean Gas Insulated Line

- Provides a higher capacity underground option.
- Current GIL contains SF6, we are looking at viable solutions to develop efficient, long-distance clean GIL.

Detailed Development

Retrofit Insulated Cross-Arms

- The technology works by replacing the existing steel cross-arm on the tower with a composite cross-arm.
- This removes the need for an additional insulator, increasing the conductor height.
- We can increase the voltage from 275 to 400kV without rebuilding the route.
- We have funding out to 2026 to develop a deployable solution.



Trial/Implementation

Deeside Centre for Innovation

- We are building our test innovation centre at Deeside in North Wales.

- We will have a real-life environment to test new technologies and asset management techniques.
- The aim is to accelerate the deployment of innovative technology onto our network by being able to understand operation outside of normal factory or lab tests.

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