

# The Great Grid Upgrade

**Marc Vincent**

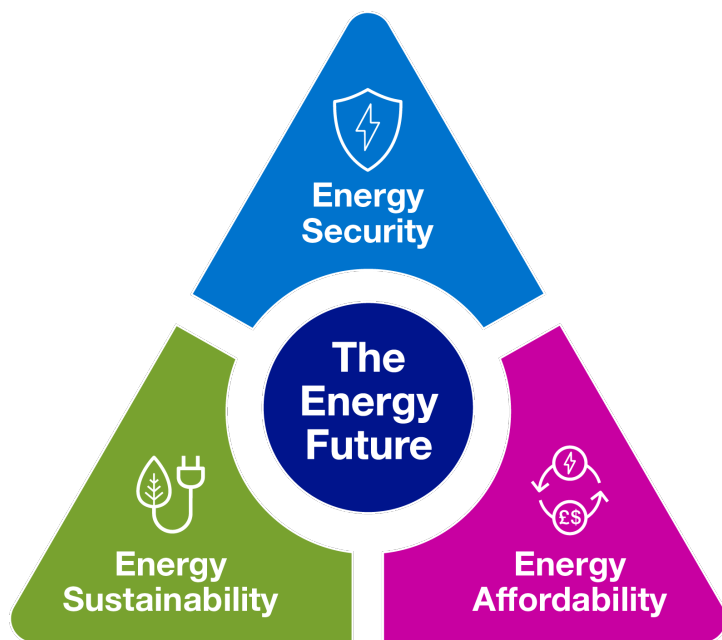
*Head of Early Project Development  
Strategic Infrastructure*

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**nationalgrid**



# The alignment of the energy trilemma with a net zero transition requires a major step change in scale and pace of capital delivery



- **Government net zero and energy security strategies are setting the ambition**
  - **50GW** of offshore wind by 2030
  - **70GW** of solar by 2035
  - **24GW** of nuclear by 2050
  - Net zero power system decarbonisation by 2035
  - Increased electrification of transport and heat
- **Driving an increase in scale, pace, and complexity of transmission infrastructure needed**
  - **~4x** increase in annual number of connection applications versus just four years ago, and rising
  - **~5x** increase in the amount of new transmission infrastructure in the next seven years versus the last 30 years

**We have an opportunity to collectively deliver societal benefits from the transition**

# In order to move our infrastructure projects forward at the pace required, there are a number of hurdles to tackle today, for tomorrow



How to **connect** customers to the grid efficiently, fairly, and timely

How to gain the **planning** permissions and consents we need to build



How to stimulate the **supply chain** we need to deliver in the context of global shortages

How to build our own **workforce** and capabilities needed to deliver



# A series of reinforcements have been identified to enable up to 50GW of Offshore Wind by 2030

As part of 'Pathway to 2030' workstream in the Offshore Transmission Network Review (OTNR), ESO published the 'Holistic Network Design' (HND) which balances four objectives...

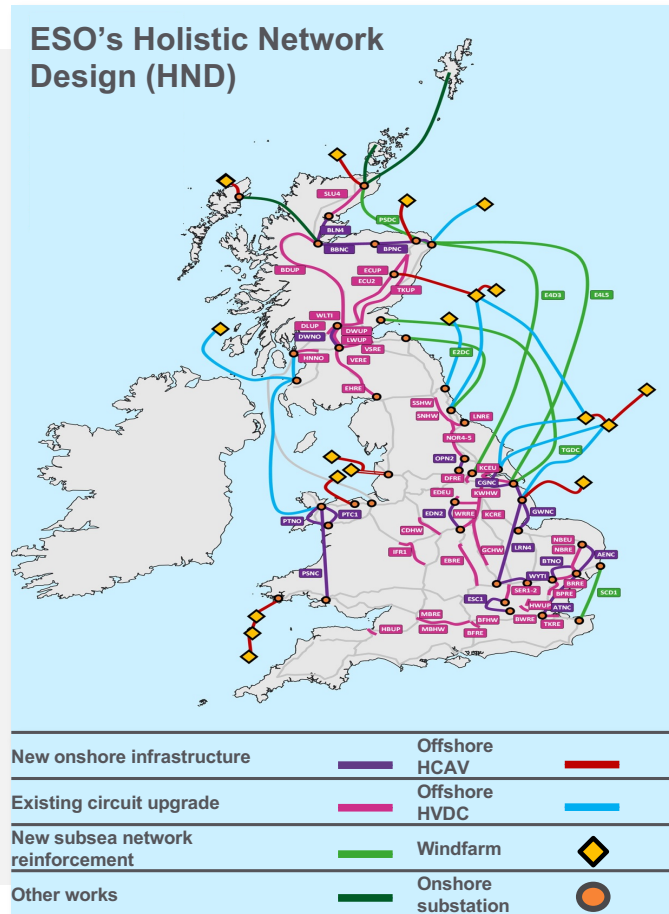
£ Cost to consumers

♻️ Impact on the environment

⬆️⬇️⬇️⬆️ Deliverability and operability

🏠 Impact on local communities

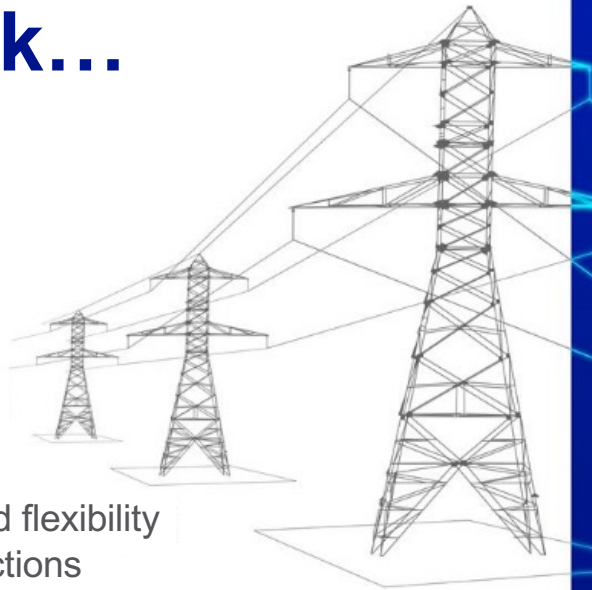
**NGET has been asked to build 17 projects and develop a further 6 to enable growth in offshore wind capacity – representing the 'Great Grid Upgrade'**



## As well as the sheer scale of the Great Grid Upgrade, we also new challenges...

- ✓ New Technology – multiple HVDC convertors interacting all over the network, power flow control devices, synchronous compensators...
- ✓ What about aging assets, future capacity requirements?
- ✓ What is next to get us to 2050? Ultra High Voltage, onshore DC, North Sea Super Grids?
- ✓ Network access – how can we connect/commission so much new infrastructure onto a highly meshed and renewable system?
- ✓ Are the standards of today suitable for the future? Grid Code/SQSS

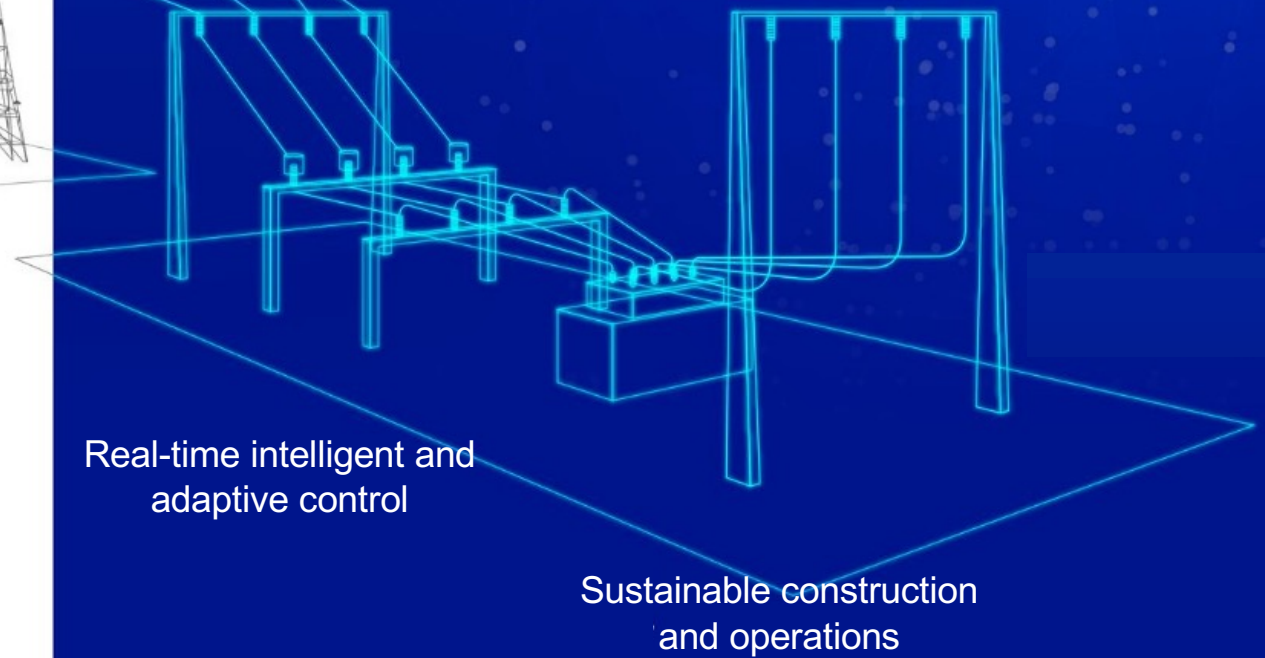
# Transforming today's network...



Optionality and flexibility of connections

Maximising availability, minimising downtime

# ...to the network of tomorrow



Real-time intelligent and adaptive control

Sustainable construction and operations

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