Strategic Infrastructure

Network Expansion and the impact on Networks, Suppliers and Utilities

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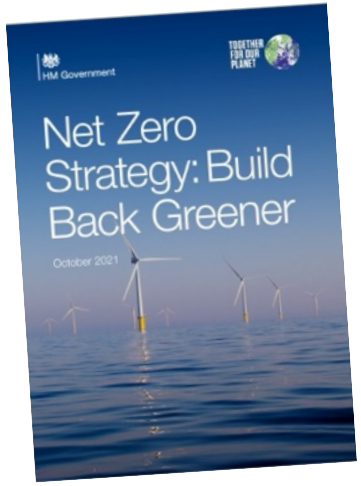
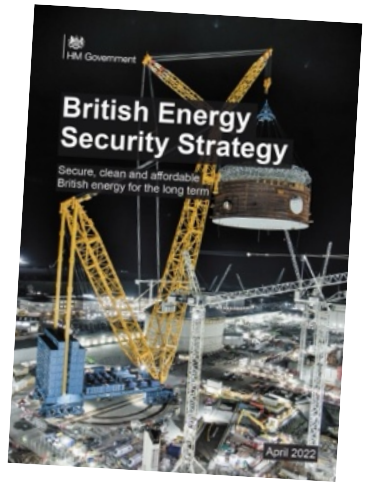
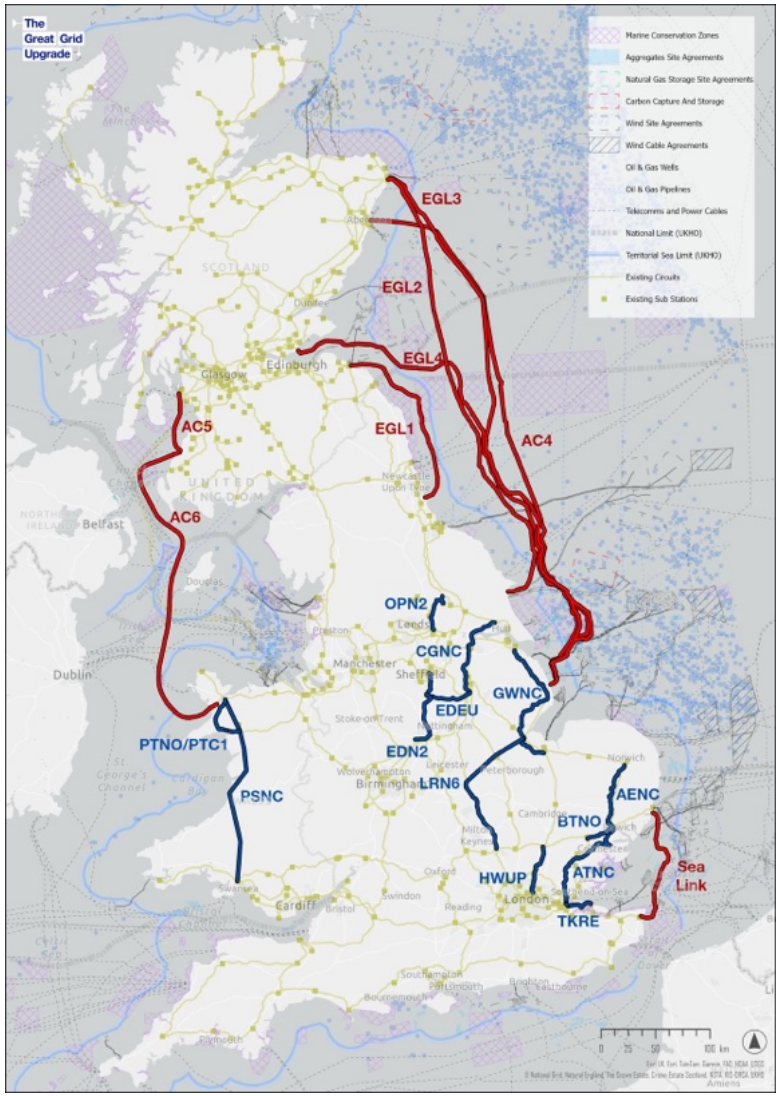
The Great Grid Upgrade

- In December 2022 Ofgem published their intentions for the ASTI framework.
- ASTI is the regulatory framework which facilitates deliver of 26 projects of strategic importance.
- The projects are identified in the ‘HND’ Pathway to 2030 report.
- National Grid are delivering 17 of those projects
- More projects to follow!





Great Grid Upgrade Project Map (incl provisional)



Back to the future!

In July 2023, the British Supergrid system turned seventy years old.

The scale of ambition back in the 1950's was profound.

Design decisions were bold and brave.

The achievement remains an inspiration

Supergrid Construction (1953-1958)

National Grid

UK first 400kV Circuit
60 years old in June!

With thanks to

Kerry Moores (National Gas)

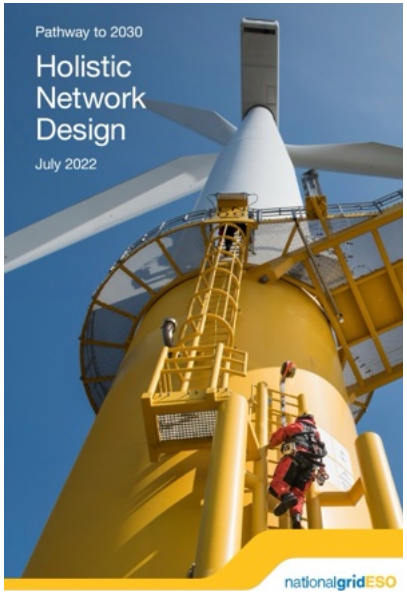
Rob Burnett (NESO)

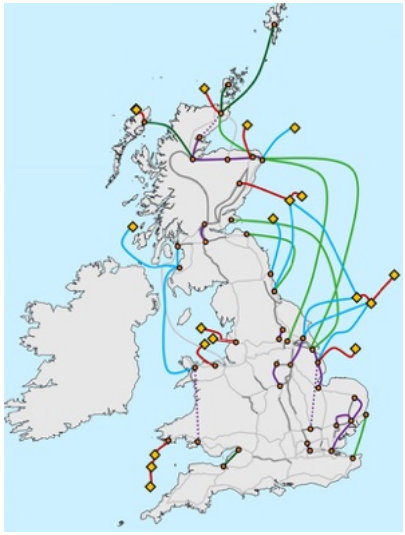
James Watson (National Grid ET)

Holistic Network Design

NGESO released the HND in July 2022. It sought to establish the optimum transmission network topology with reference to the following objectives:

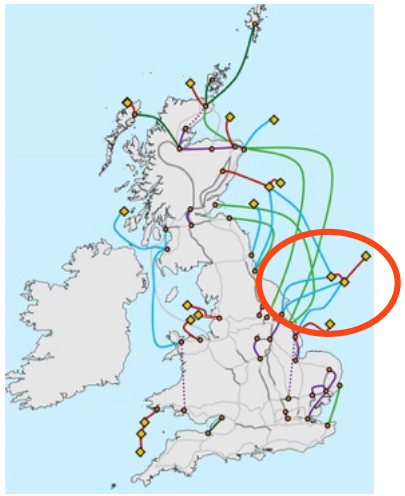
- Minimise Cost to consumers
- Maximise Deliverability and operability
- Minimise Impact on the environment
- Minimise Impact on local communities

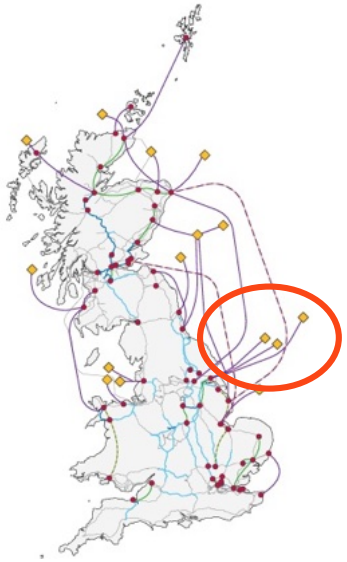




Holistic Network Design Follow Up

- HND Follow Up Exercise was published in March 2024 as part of the ‘Beyond 2030’ Document.
- It included some changes, largely driven by the cost of offshore equipment, lead times and realising other opportunities to increase capacity.

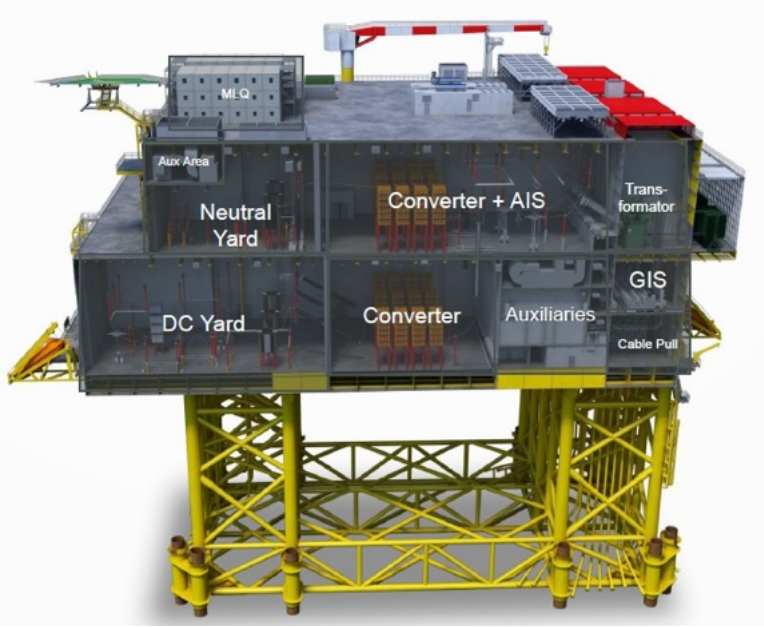




Offshore Platforms

1.4 GW – Sofia (RWE)

Tennet 2GW Platform



Challenges with delivering the Great Grid Upgrade

Delivery	Technology & Engineering
Consenting & Planning Permission	Quality
Securing System Outages for construction	New production lines / factories / vendors
Supply of Equipment	Unproven technologies, new generation products
Land Shortage	Extreme Short Circuit Levels
Landfall shortage	Harmonic Performance
Supply of Skills	System Interaction
Vessel shortage	Security Classifications

How are National Grid Delivering the Great Grid Upgrade

1. **Established dedicated business unit “Strategic Infrastructure” (SI) in April 2023**
2. **SI now has 1300+ NG Employees and actively recruiting**
3. **SI divided into Onshore and Offshore Project Delivery**

Onshore Projects

‘Conventional’ Transmission Assets

‘Enterprise’ Delivery with 7 Partners

Offshore Projects

HVDC Converters & Subsea Cables

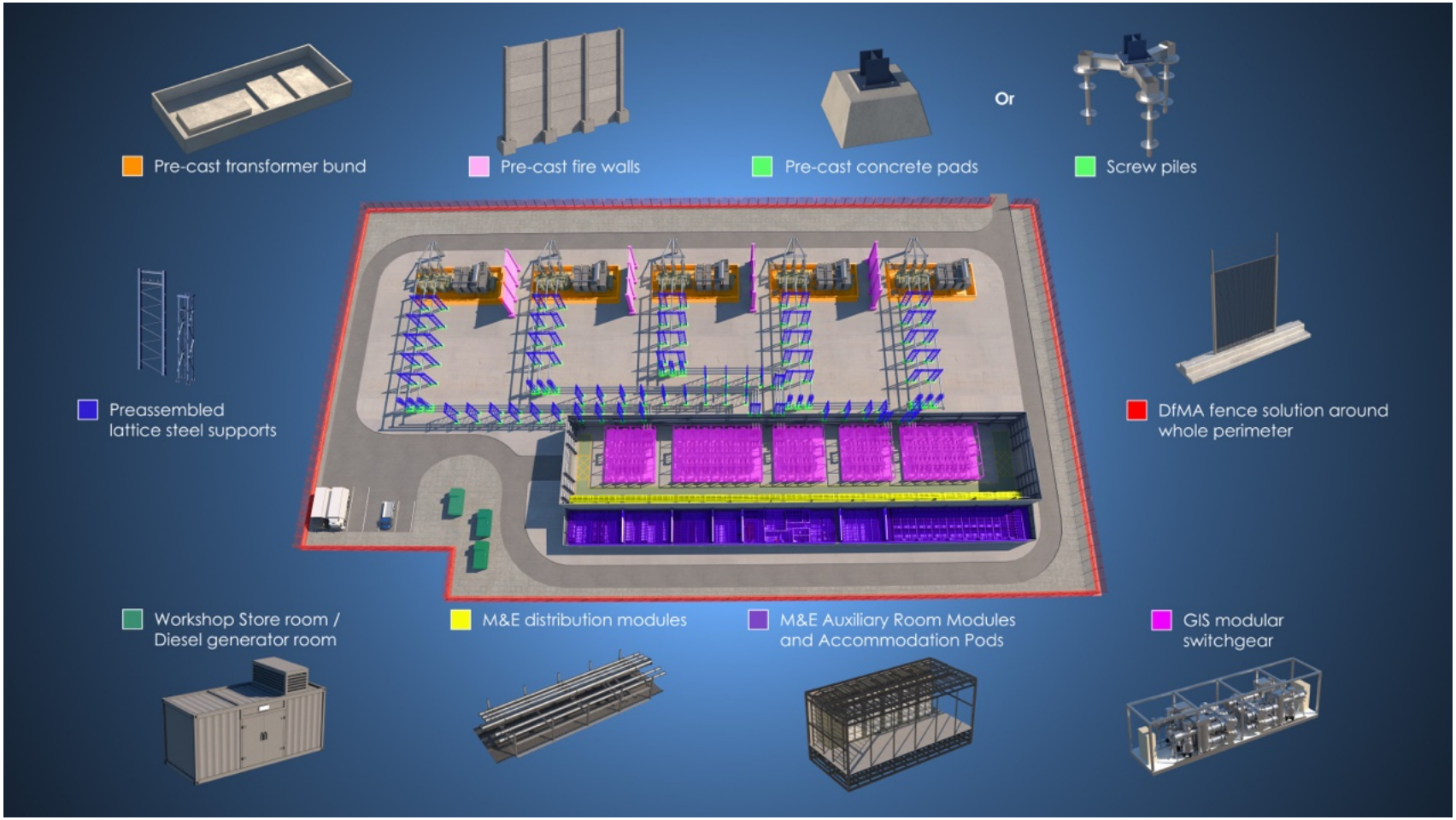
& associated Connection Works

Classic Delivery Model

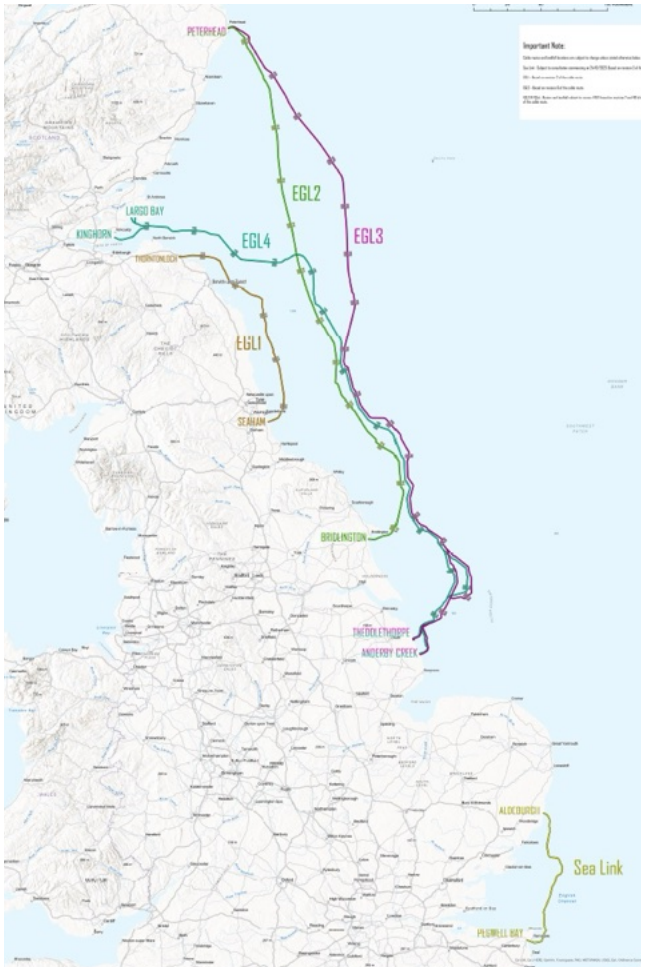
Onshore Projects – Equipment Volumes

Project	SGTs	Shunt Reactor	Quad Booster	AIS Bays	GIS Bays	AC Cable (route km)	AC Cable (material km)	Conductor (route km)	Conductor (material km)	Steel Towers
AENC/ATNC	2	12	-	27	17	21	378	159	2862	510
BPRE	-	-	-	-	-	-		99	891	-
CGNC	-	-	-	-	-	-	-	90	1620	270
CMN3	-	2	-	2	-	10	120	30	540	100
EDEU	6	-	-	30	18	Tbc	2	1	10	20
EDN2	-	-	-	-	-	-	-	62	1116	200
Friston	-	-	-	4	16	-	-	0.35	6.3	2
FSU1	4	4	-	14	-	0.2	2.4	84	1512	198
GWNC	10	-	-	117	-	-	-	140	2520	441
LRN#	-	-	2	20	-	-	-	113	2034	171
PSNC	10	2	-	59	2	42.5	510	385.5	6939	1300
PTNO/PTC1	1	1	-	4	-	6	72	16	96	2
TKRE	-	-	-	-	-	-	-	27	486	2
WRRE/SCRE	-	-	-	-	-	1	6	94	564	-
Totals	33	21	2	277	53	82.7	1090	1300	21196	3216

Standardisation – Onshore Projects



Offshore Projects - 525kV 2GW HVDC Portfolio



Project	Joint Venture	HVDC Route Length (approx)	In-Service	Status
EGL1 – Torness to Hawthorn Pit	NGET & SPT	196	2029	In Delivery
EGL2 – Peterhead to Drax	NGET & SSEN	502	2029	In Delivery
EGL3 – Peterhead to Walpole	NGET & SSEN	554	2033	In tender
EGL4 – Westfield to Walpole	NGET & SPT	391	2033	In tender
Sea Link – Friston to Minster	NGET only	126	2030	In tender
AC4	TBC	TBC	TBC	In Development
AC5&6 (Hunterston to North Wales Multi-Terminal)	TBC	TBC	TBC	In Development

Eastern Green Link 1 & 2 project spotlight

	Eastern Green Link 1	Eastern Green Link 2
Route	Torness to Hawthorn Pit	Peterhead to Drax
Route Length (km)	196km (174 marine)	502 (436 marine)
Converter Contractor	GE Vernova & Metlen	Hitachi Energy & BAM Nuttall
Converter Details	525kV 2GW Rigid Bipole, Modular Multi-level Topology	
Cable Contractor	Prysmian Powerlink	Prysmian Powerlink
HVDC Cable details	525kV XLPE in bundled lay (1 cable per pole)	
In Service	2029	2029
Connection Works	10 bay SF6-free GIS with additional 10 bay expandability, OHL voltage uprating	Single SF6-free GIS bay, OHL & Cable uprating

EGL1 EASTERN GREEN LINK

Eastern Green Link 2

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