

North West Coast Connections Project



Morecambe Bay Partnership Conference 8th October 2011

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The Energy Challenge

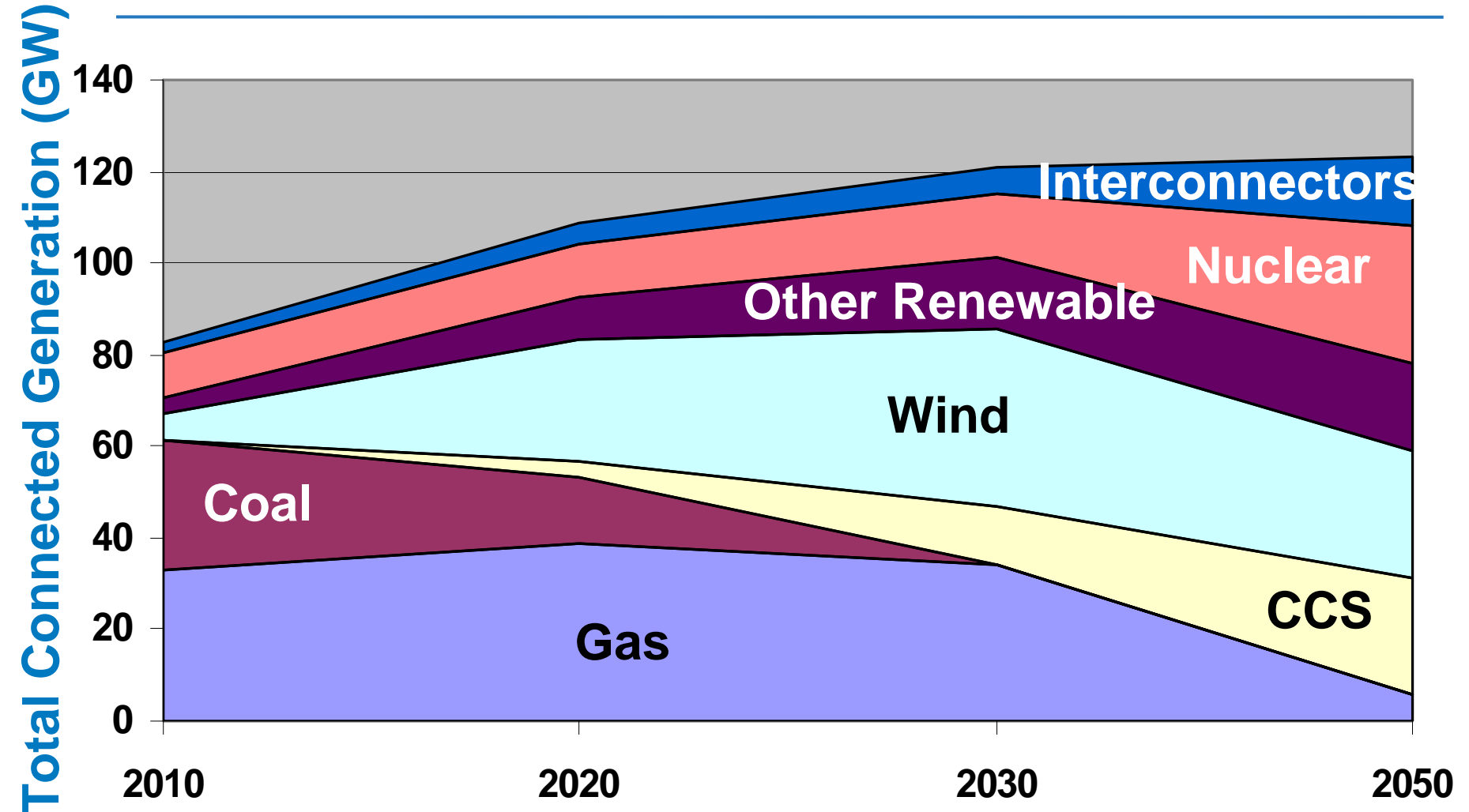
The Energy Challenge



UK Low Carbon Energy Targets

- CO2 emissions in 2020 to be 34% below 1990 levels
- Electricity to contribute 50% of this saving
- By 2020 the Government expects
 - 40% of generation to be renewable eg wind and hydro
 - 10% of generation to be low carbon eg nuclear and clean coal

What Does This Mean For Generation?



Introduction to National Grid

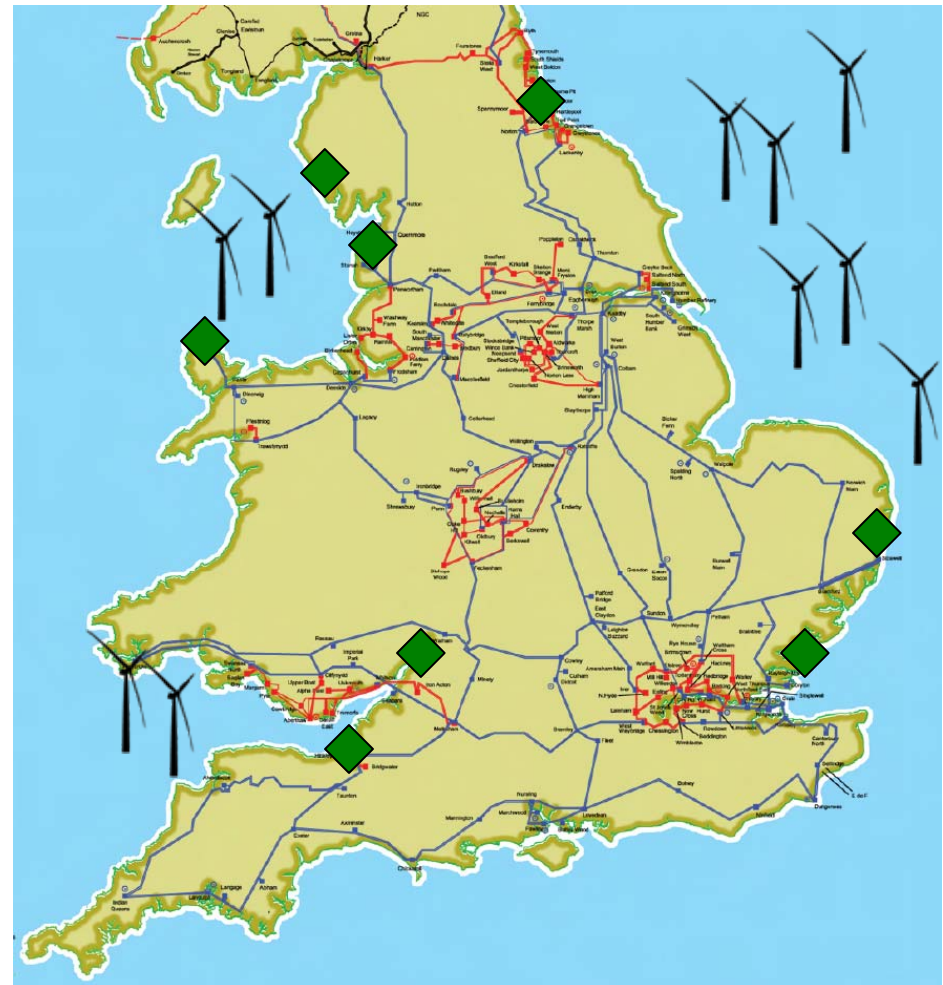
An International Electricity and Gas Company

- One of the largest investor-owned utilities in the world. Largest utility in UK and second largest utility in US.*
 - Almost 18 million customers
 - 50% UK, 50% US
 - 50% Electricity, 50% Gas
 - 50% Transmission, 50% Distribution
 - 27,000 plus employees
- **UK Electricity**
 - 4,500 route miles of overhead line
 - 420 route miles of underground cable
 - More than 335 substations



What Do We Have To Do?

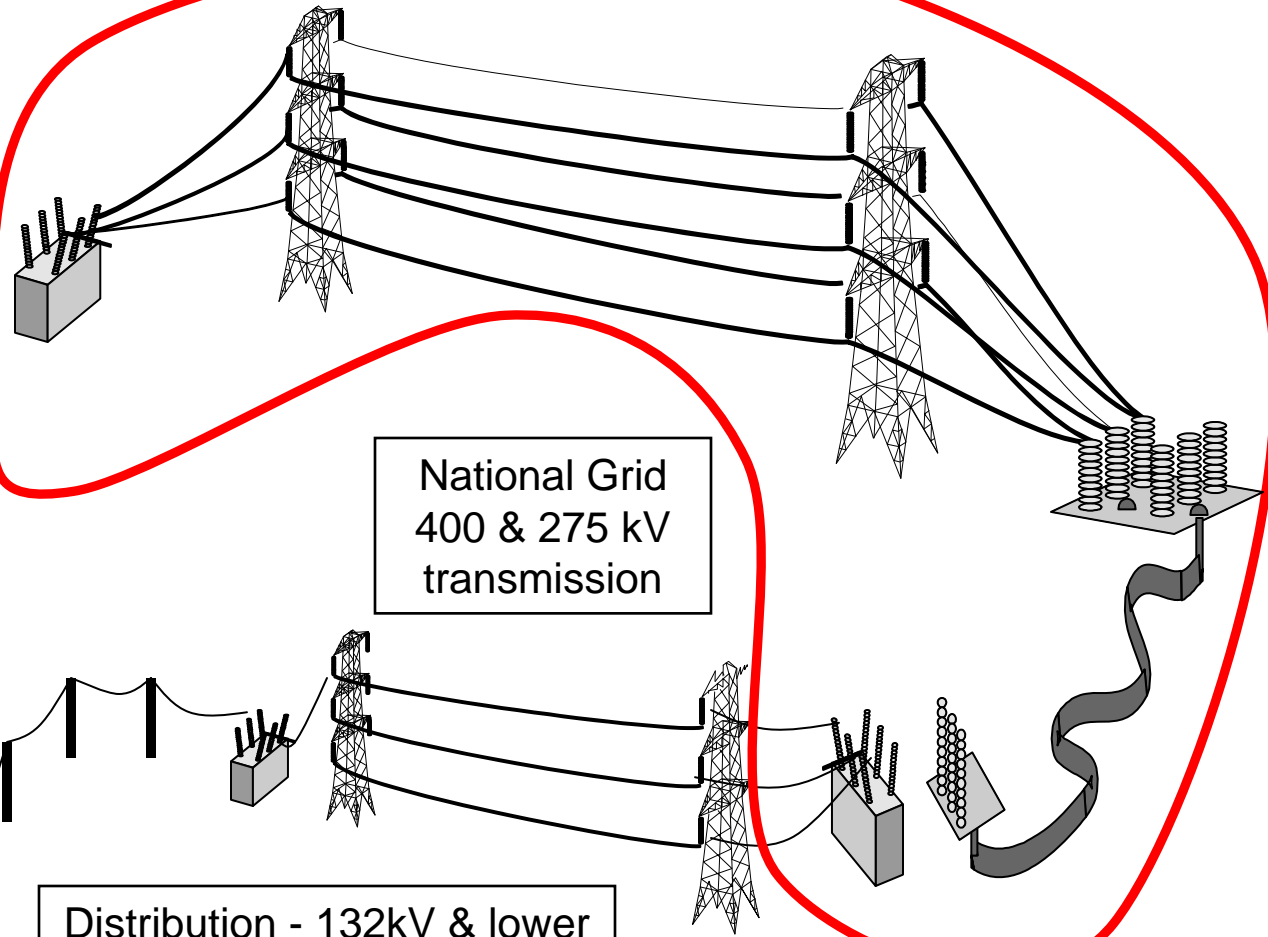
- Existing Grid takes electricity from coalfields to cities
- Future low carbon generation predominantly on the coast
- New connections needed



The Electricity System - From Generator to Consumer



Generation



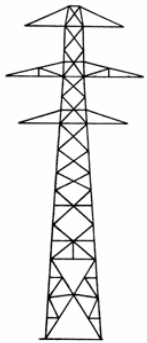
National Grid
400 & 275 kV
transmission

Distribution - 132kV & lower

Technologies

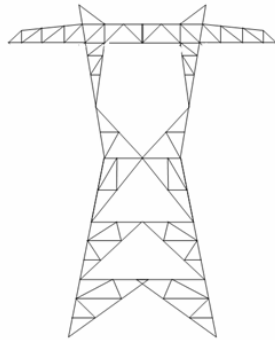
How Do We Do It?

Technologies for Connection 400kV AC Overhead Line



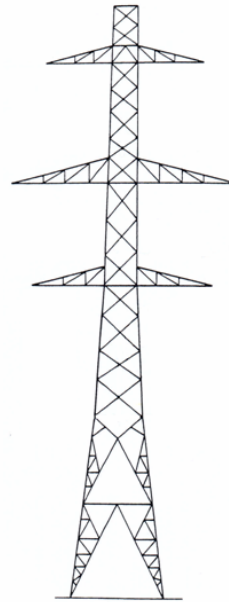
Existing 132kV double circuit

300MW



400kV single circuit

3600MW



400kV double circuit

7200MW



Technologies for Connection Underground 400kV AC Cable



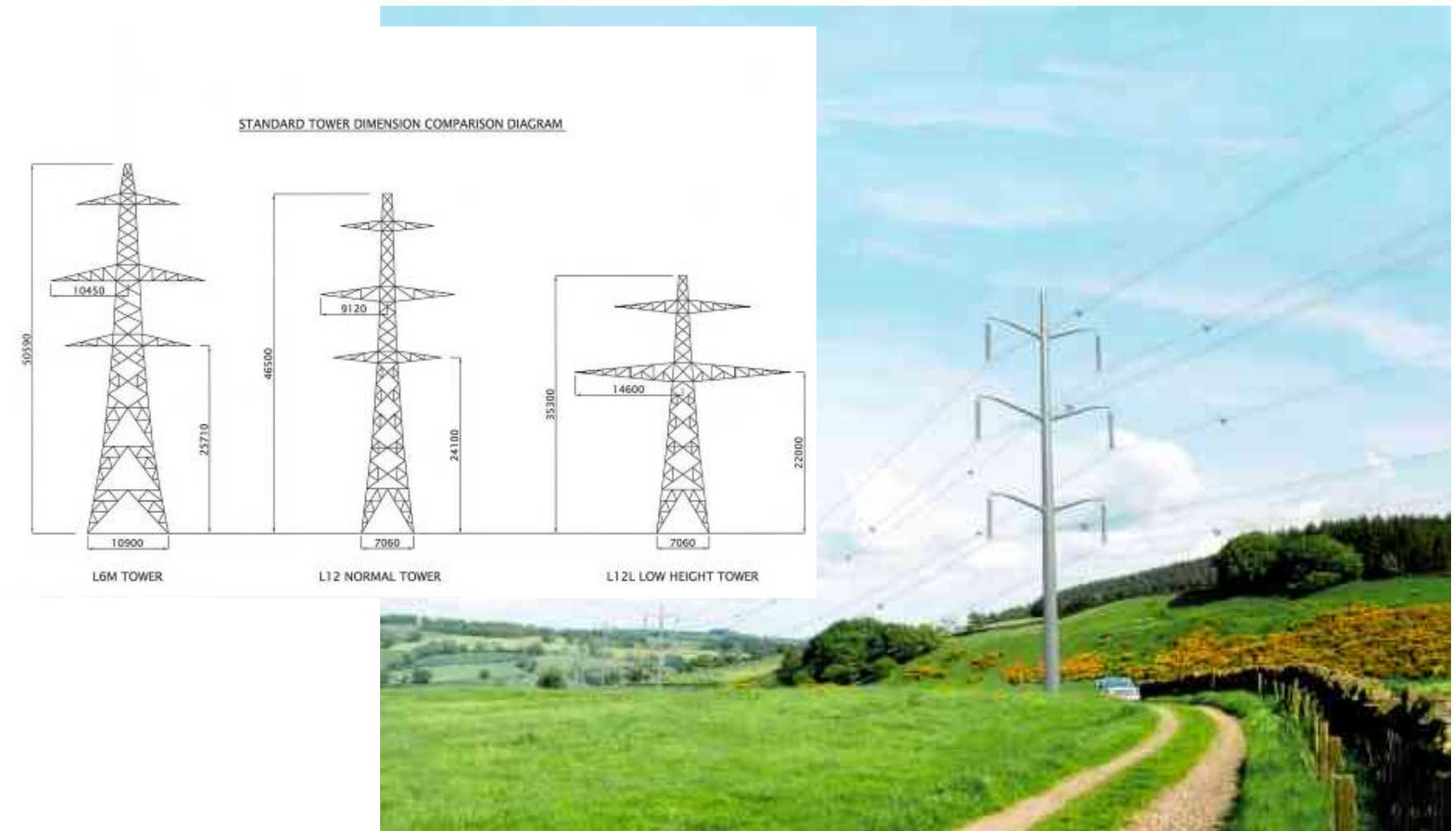
Technologies for Connection

High Voltage Direct Current (HVDC)

- NG would expect this to be Undersea / underground
- Much narrower cable route than AC
- Does not exist today at required power levels
- Will technology be available by 2014?

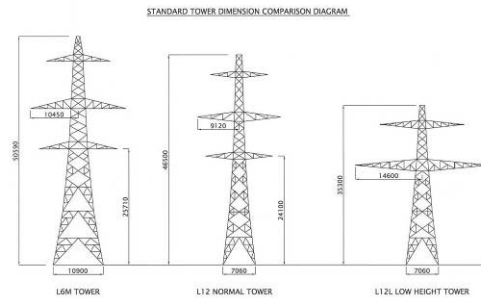


Reducing Environmental Impact



Reducing Environmental Impact

- Low height towers
 - ~35m compared to ~50m, but closer spacing therefore more of them
- Opportunity Corridors
 - Rationalisation of existing low voltage electricity lines (ENW Ltd)
- Tower design
 - e.g. folded plate pole alternatives
 - National design competition (DECC/RIBA)
 - www.ribapylonddesign.com
- Use of virtual reality modelling
 - e.g. Northfleet East, Fourstones, Newby to Nunthorpe cables, Hackney, Woodhead tunnel
- Off-site planting
 - e.g. Second Yorkshire Line





Pylon Design Competition



nationalgrid

nationalgrid
THE POWER OF ACTION



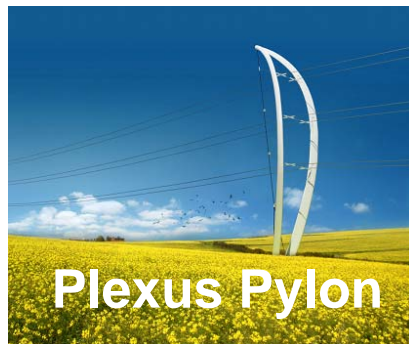
**Silhouette
Pylon**



The T-Pylon



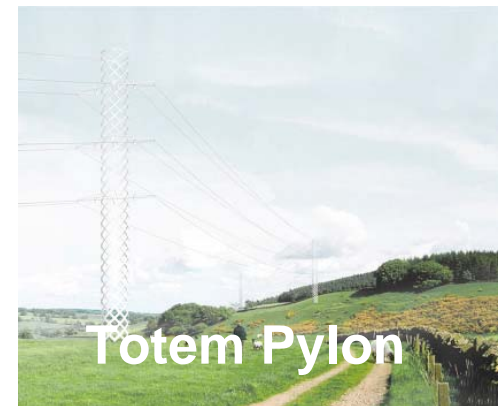
**Flower
Tower**



Plexus Pylon



Y-Pylon











Totem Pylon

Strategic Options for The North West Coast Connection Project

national**grid**
THE POWER OF ACTION

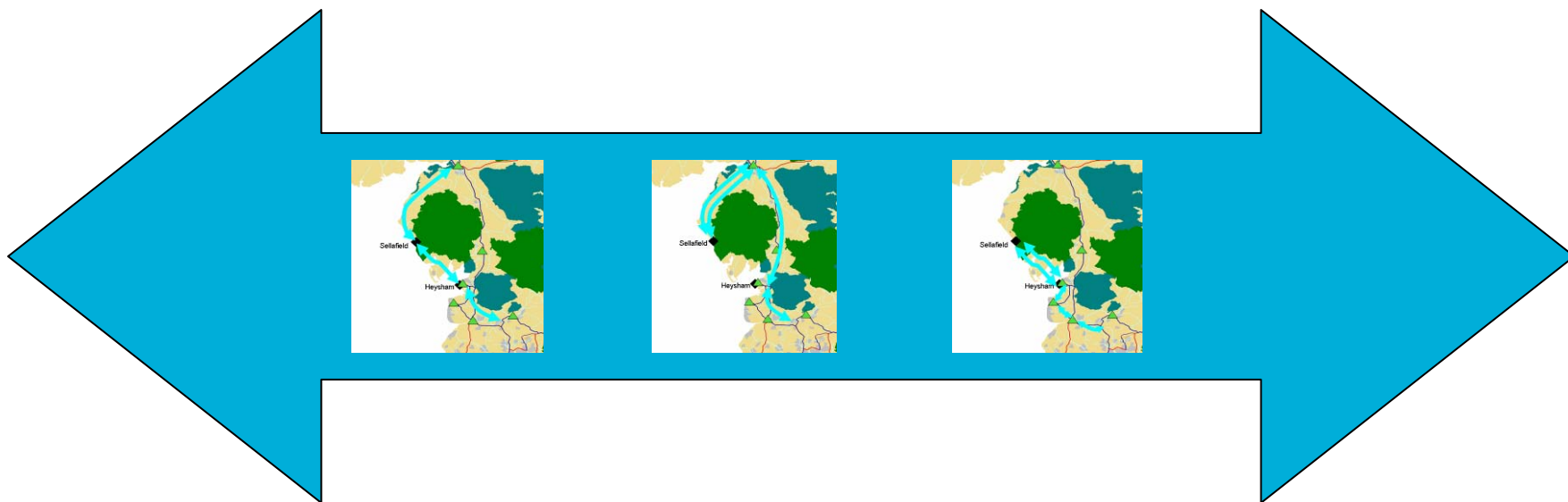
Existing NG System & Nuclear NPS Sites

Key	
Existing Transmission System	 
Existing Substation	
National Park	
AONB	
New Substation	
System Connection	
Nuclear Site	



Process for Evaluating Options and Selecting a Route

What is a Transmission Strategic Option?



A technically acceptable and feasible means of connecting between two points in a power system, with consideration of the following:

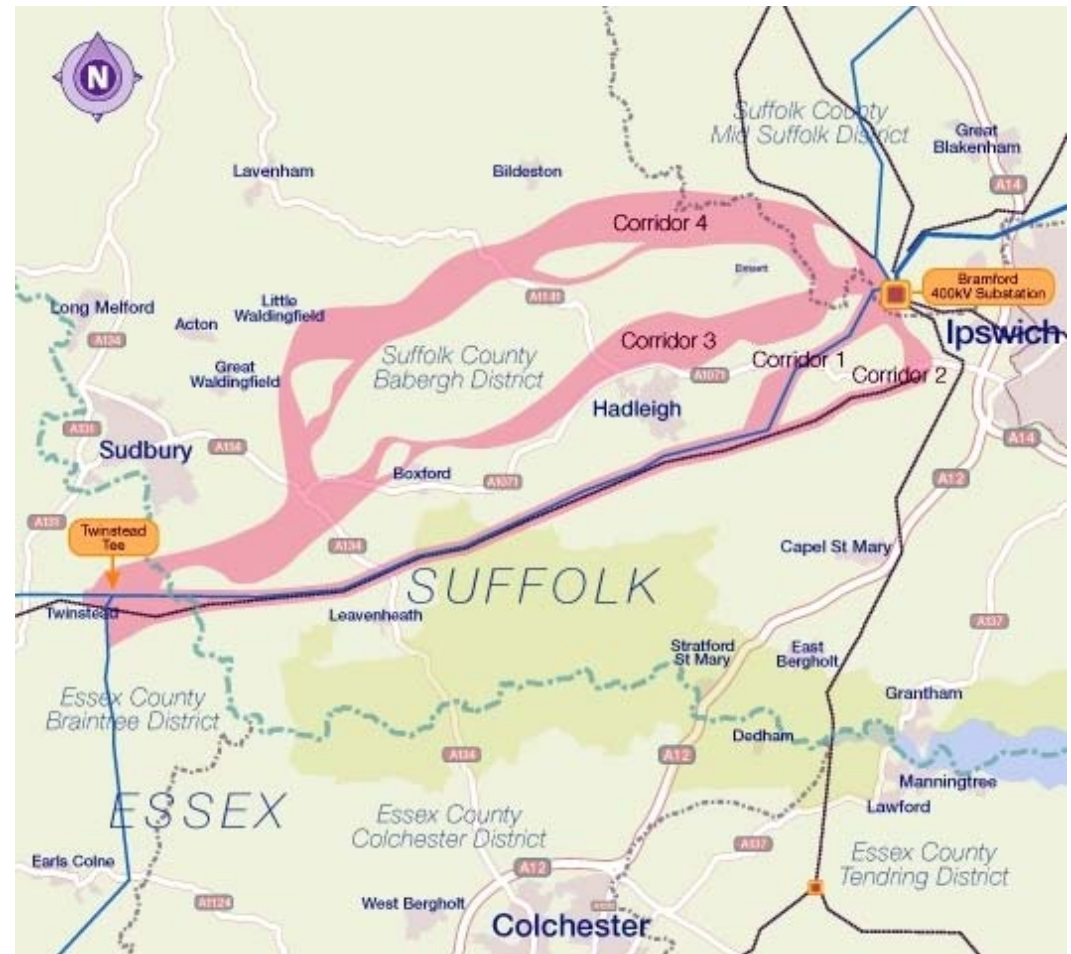
- Environment
- Energy, resource use, waste
- Community / economy
- Safety
- Technical and financial issues

Process Stage 1 – Choose the Strategic Option (s)

- All reasonable options identified which meet the project need
- All technologies considered - AC overhead, AC underground, HVDC and AC / HVDC hybrid
- Land and Sea
- Engagement with stakeholders and the public to test that NG have understood the sensitivities of each area

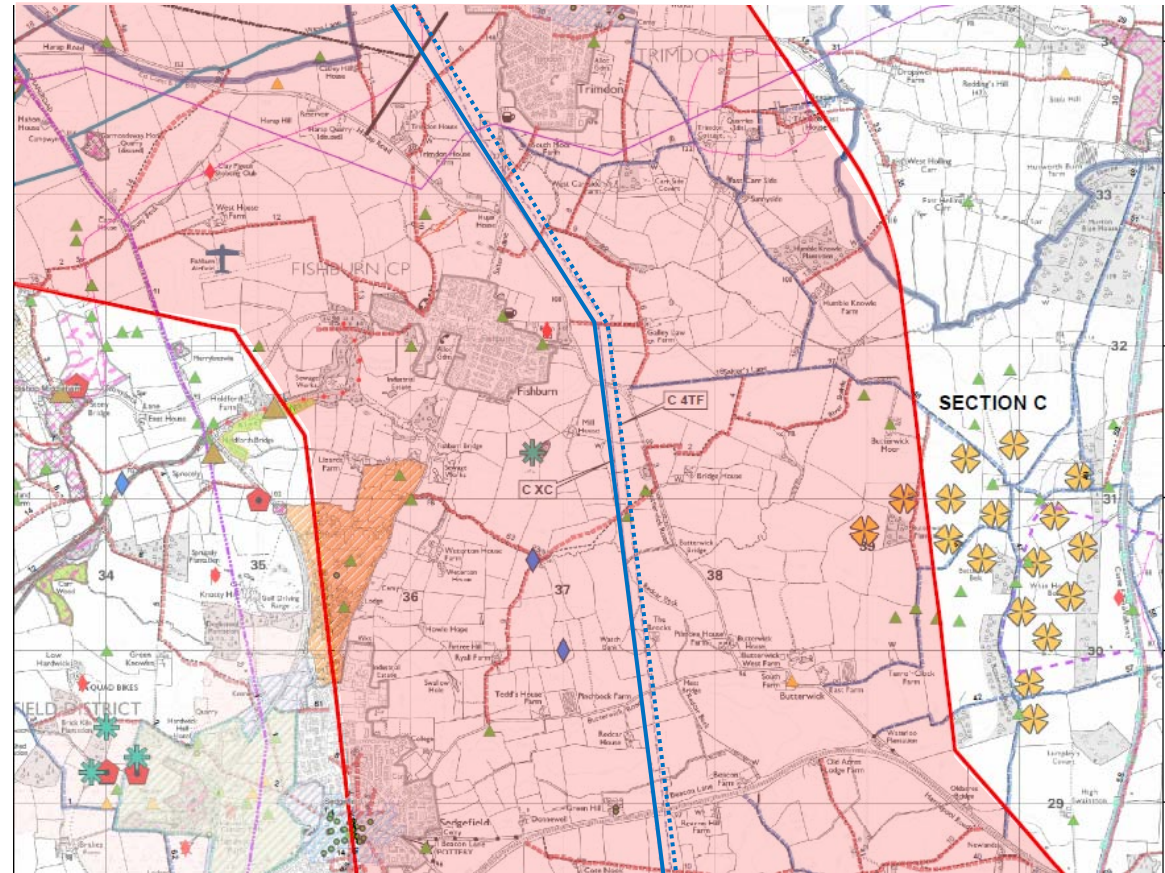
Process Stage 2 – Outline Routeing / Siting

- Choose a broad corridor within which a pylons or underground cables could be located
- Derived from:
 - sensitivity assessment
 - constraint mapping



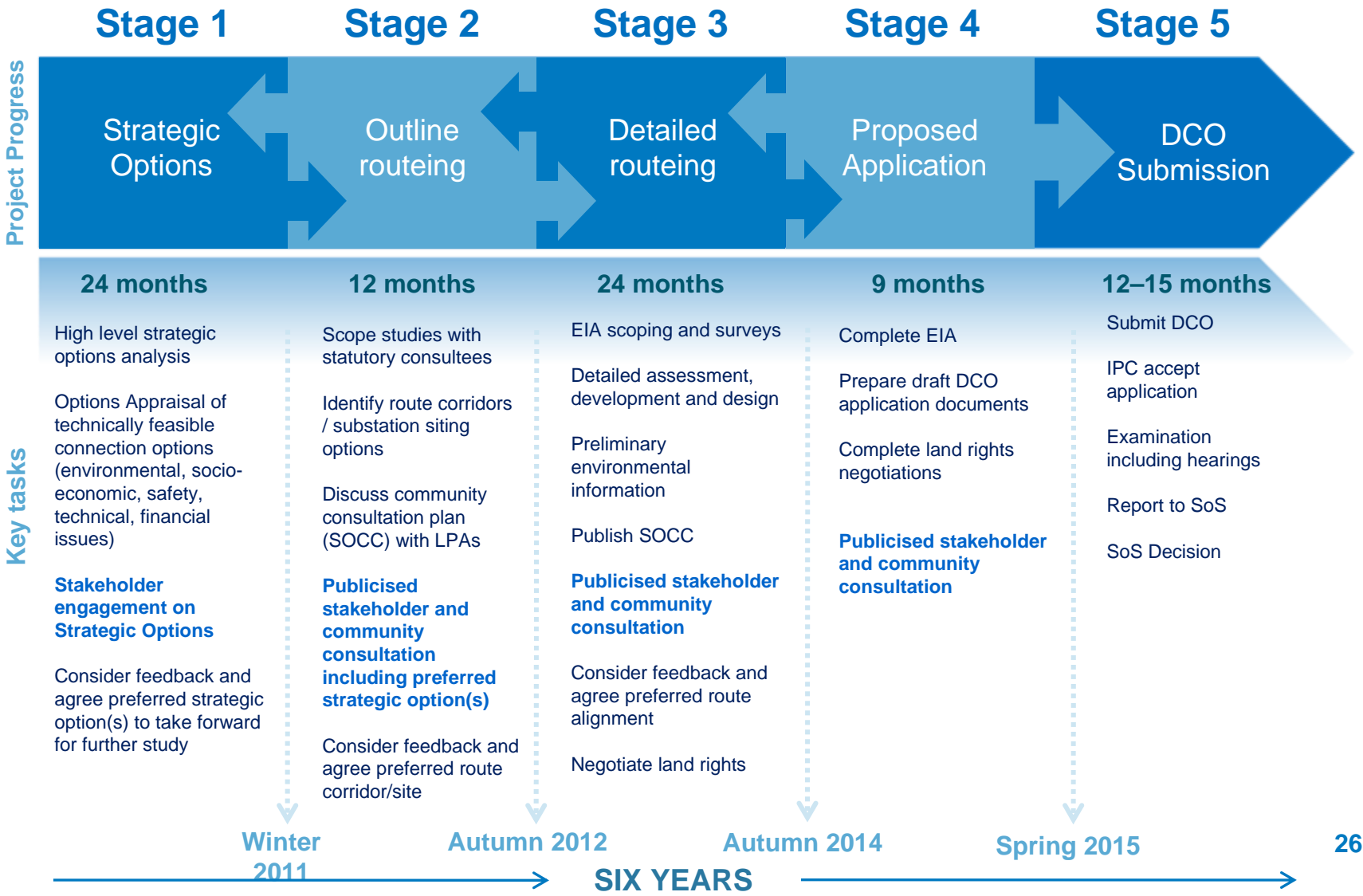
Process Stage 3 – Detailed Routing / Siting

- Choose the Pylon Positions / Cable Route Alignment
- Environmental Impact Assessment
- Pylon sites/ specific cable routes
- Substation sites



Programme

Project programme



The Energy Challenge



Any Questions?

