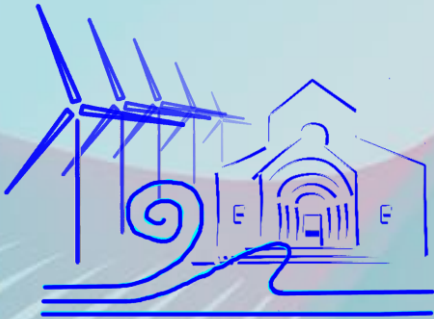




Delivering a New Energy



## OFFSHORE WIND ENERGY DEVELOPMENT IN THE ADRIATIC SEA: THE P.O.W.E.R.E.D. PROJECT AS PLANNING POLICY

### ***Wind Energy - Stepping Offshore to Building an Industry***

**Event:** Presentation to P.O.W.E.R.E.D. Project Conference

**Venue:** Università Politecnica delle Marche, Ancona

**Date:** 29<sup>th</sup> May 2013



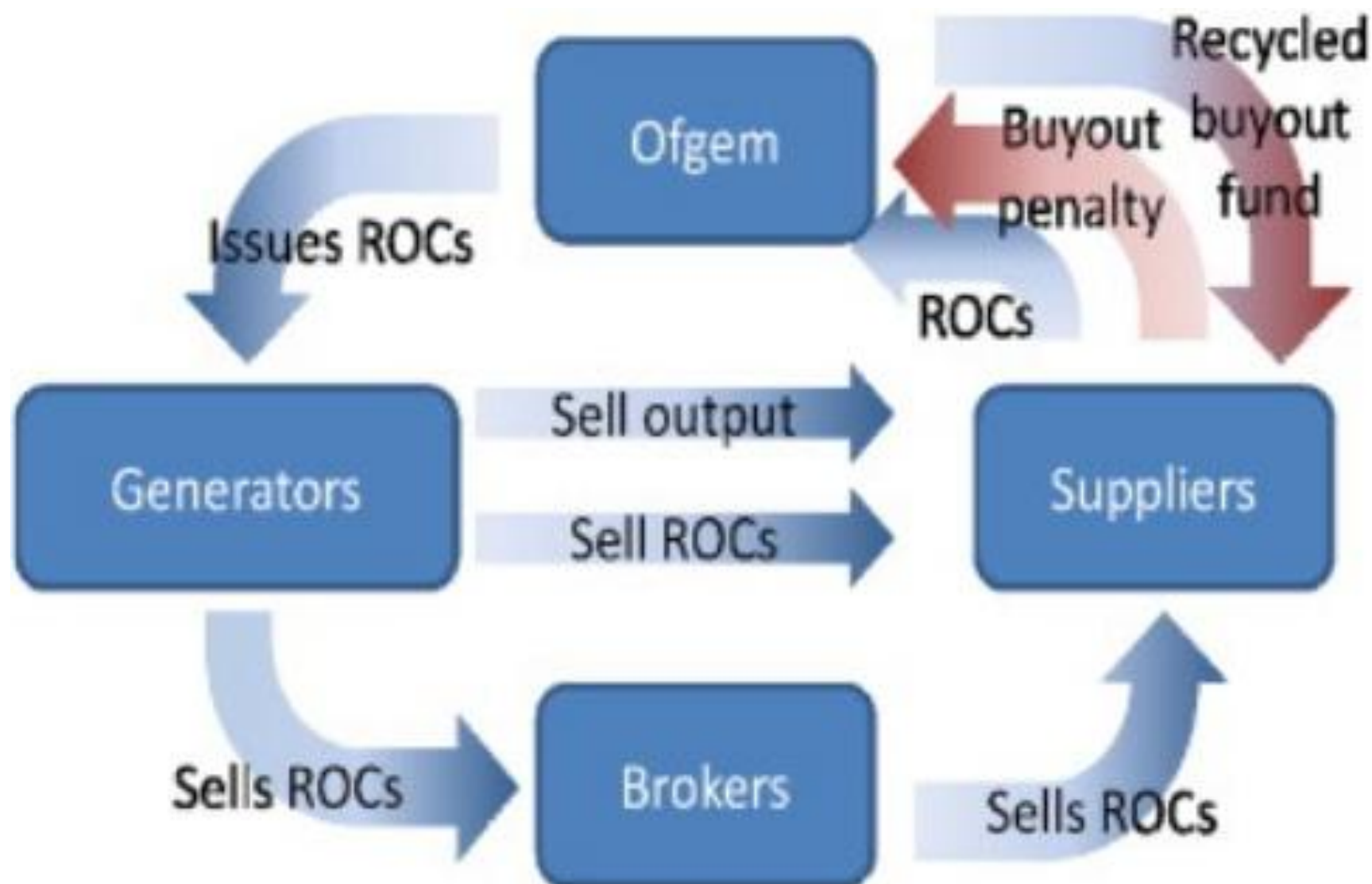
[smartwind.co.uk](http://smartwind.co.uk)

SMart Wind Ltd. is a joint venture between Mainstream Renewable Power  
and Siemens Project Ventures GmbH

# An Introduction to Mainstream Renewable Power

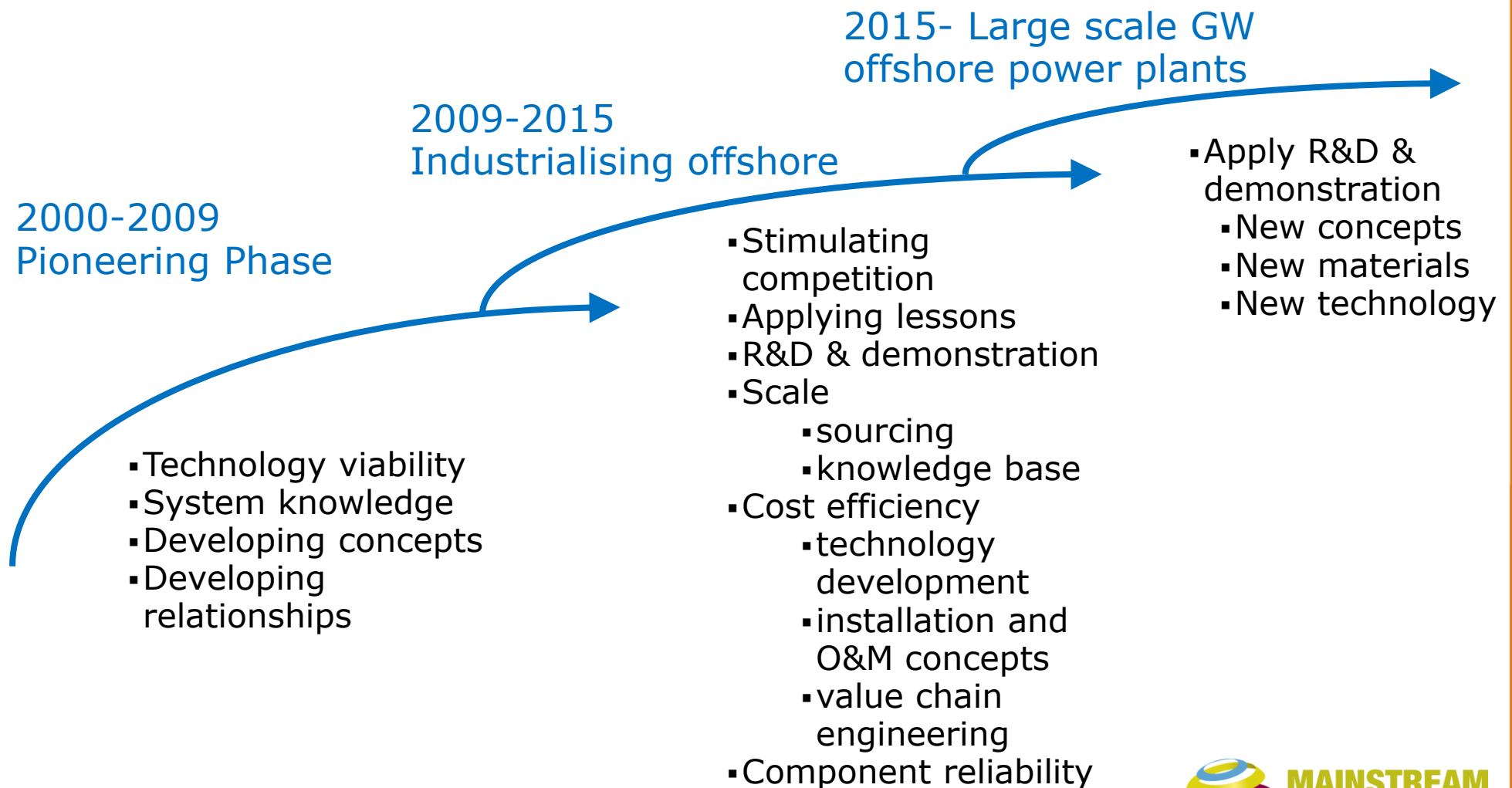


# Renewables Obligation – The Economic / Business Case





## *Enabling Wind Energy to Step 'Offshore'*



# SMart Wind Ltd.

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50:50 Supply Chain-led, Joint Venture Consortium

**SIEMENS**

- With revenues in fiscal year 2011 of €30 billion from its Environmental Portfolio, Siemens is one of the world's largest suppliers of eco-friendly technologies



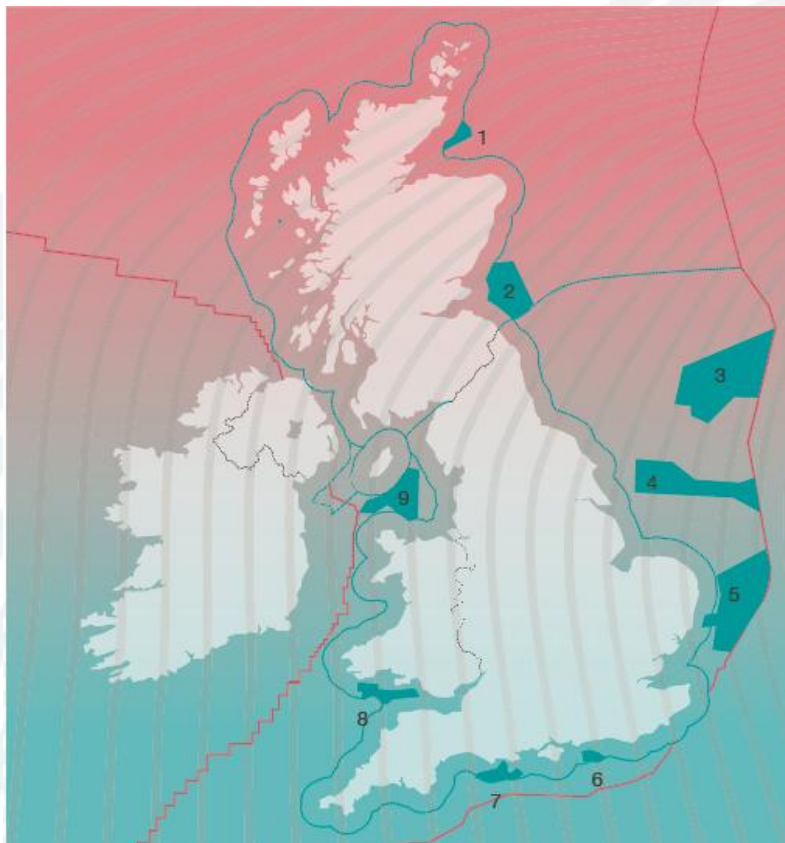
- A leading developer of large scale renewable energy projects that accelerate global progress towards a sustainable future
- To make the UK the powerhouse of Europe by accelerating and maximising offshore wind delivery and realising the Supergrid

World Leading Companies with Complementary Objectives



# Introducing the Hornsea Offshore Wind Farm

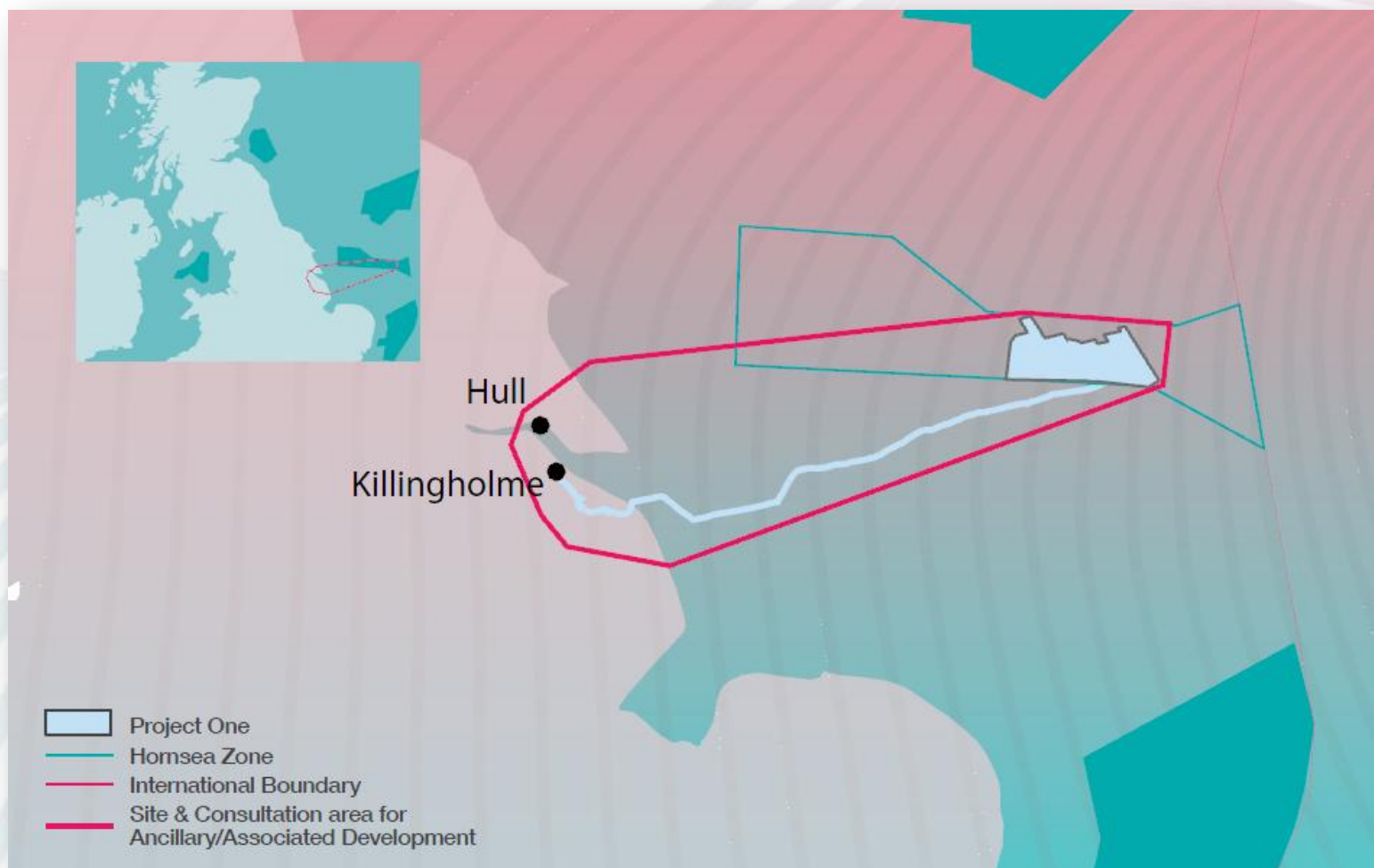
## The Crown Estate Round 3, Zone 4



- The UK goal for renewable electricity generation is approximately 30%. Hornsea's offshore generation could account for approximately 12% of that target.
- The Hornsea Zone has the potential to provide enough electricity to meet approximately 4% of all electricity demand in the UK and power approximately 3 million homes.
- The total Zone area is 4,735 km<sup>2</sup>
- The Zone lies between 31km and 190km off the Yorkshire coast.
- Water depths across the Zone are predominantly between 30 and 40m, with maximum depths to 70m.
- The width of the Hornsea Zone is approximately equivalent to the width of the UK from Liverpool to Hull.



# Hornsea Zone – Project One



**SIEMENS**

**DONG**  
energy



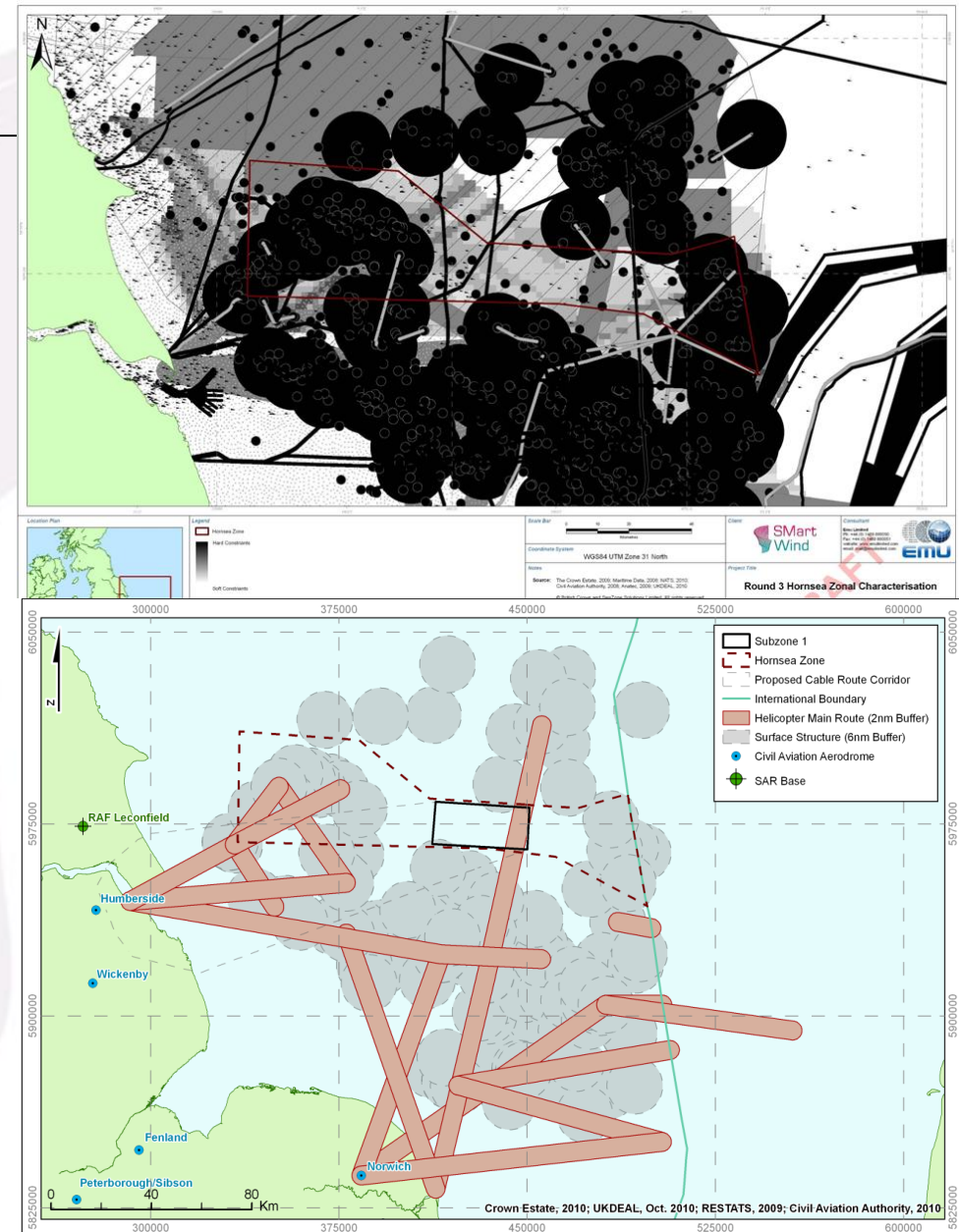
The Project One Agreement for Lease (AfL) from The Crown Estate was signed on 20<sup>th</sup> July 2011 and the cable route AfL was signed in January 2012



# Hard-Constraints Base Case

## “Low-Hanging Fruit”

- Suspended wells – no buffer applied at this stage;
- Completed, drilling, plugged and abandoned wells with 500 m buffers;
- Active subsurface structures with 500 m buffers;
- Surface structures with helipads 6 Nm buffer;
- Surface structures without helipads also have a 6 Nm buffer at this stage;
- IMO routes (located in the south east corner tip of the Zone)
- Any development/structure that has been consented;
- Wrecks have a 200 m buffer, which will be reviewed on a case-by-case basis once further data and information about individual wrecks have been obtained;
- Active pipelines plus 500 m buffer; and
- Active cables plus 500 m buffer.





# Turbine Parameters

**Turbine Height (MHWS)**

**Project :**

**One = 200m**

**Two to Four = 272m**

**Rotor Diameter**

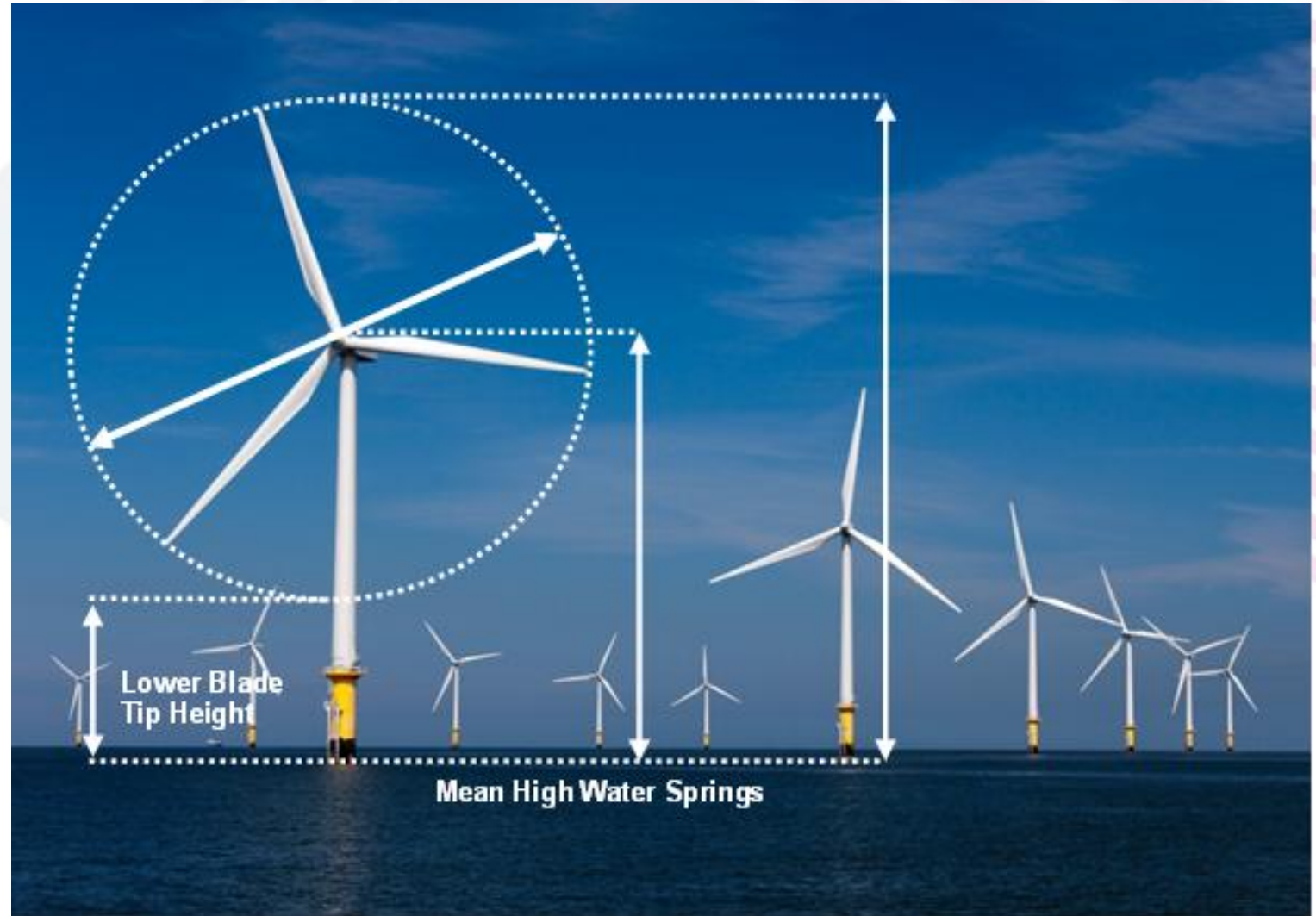
**Project :**

**One = 178m**

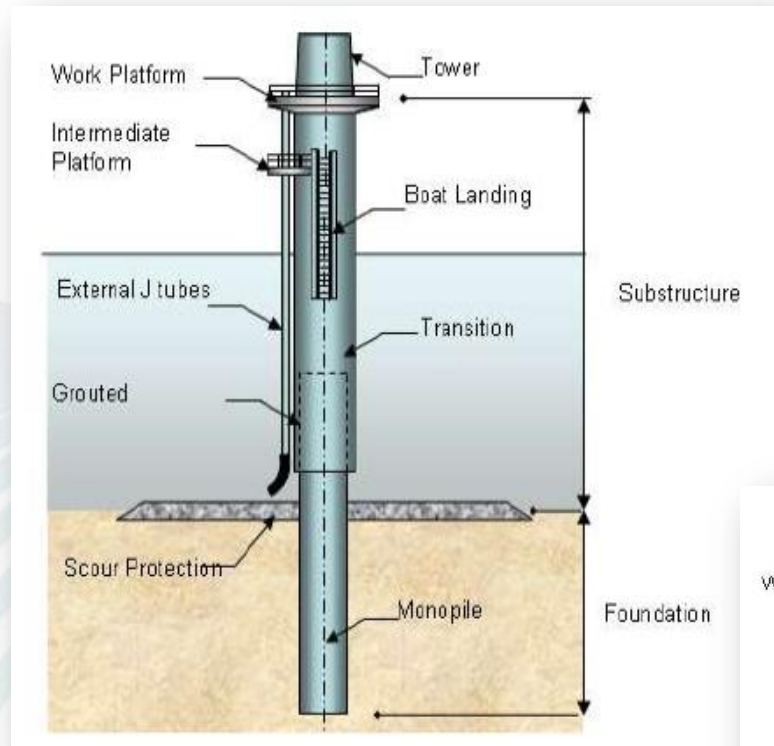
**Two to Four = 250m**

**Lower Blade Tip Height**

**All Projects = 22m**



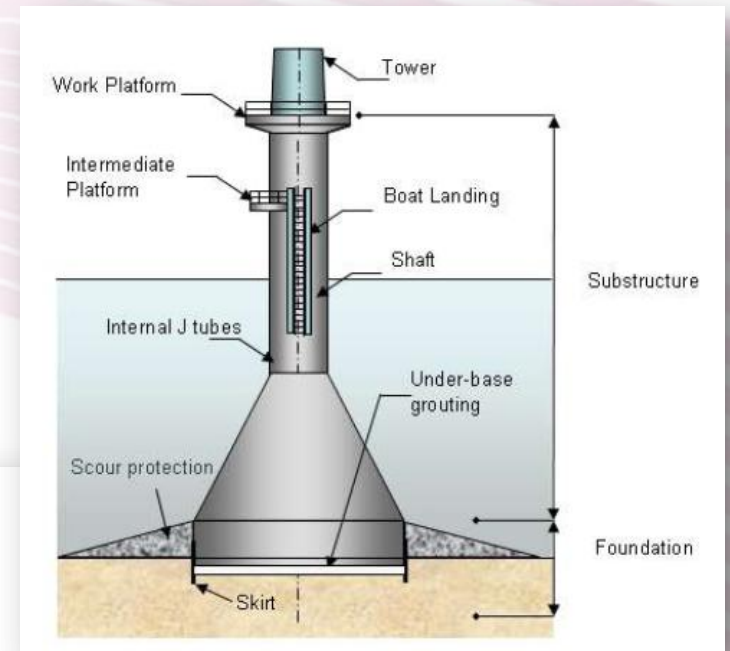
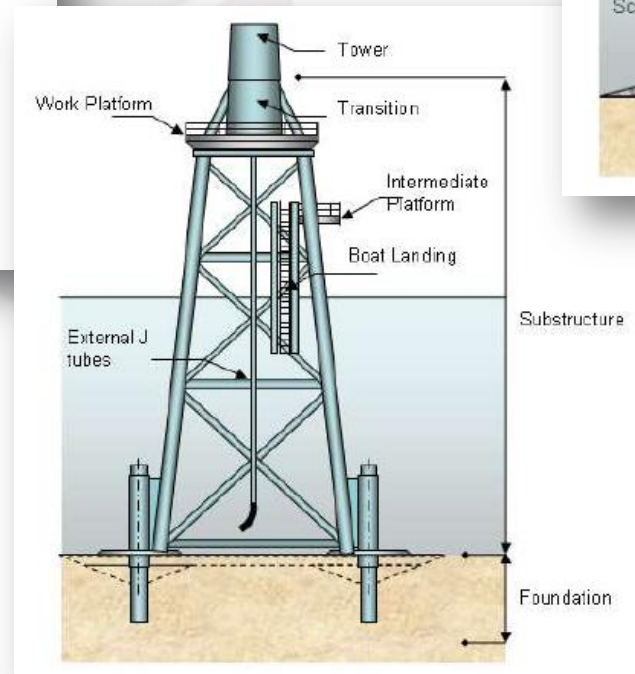
# Turbine Foundation Options



**Monopile**

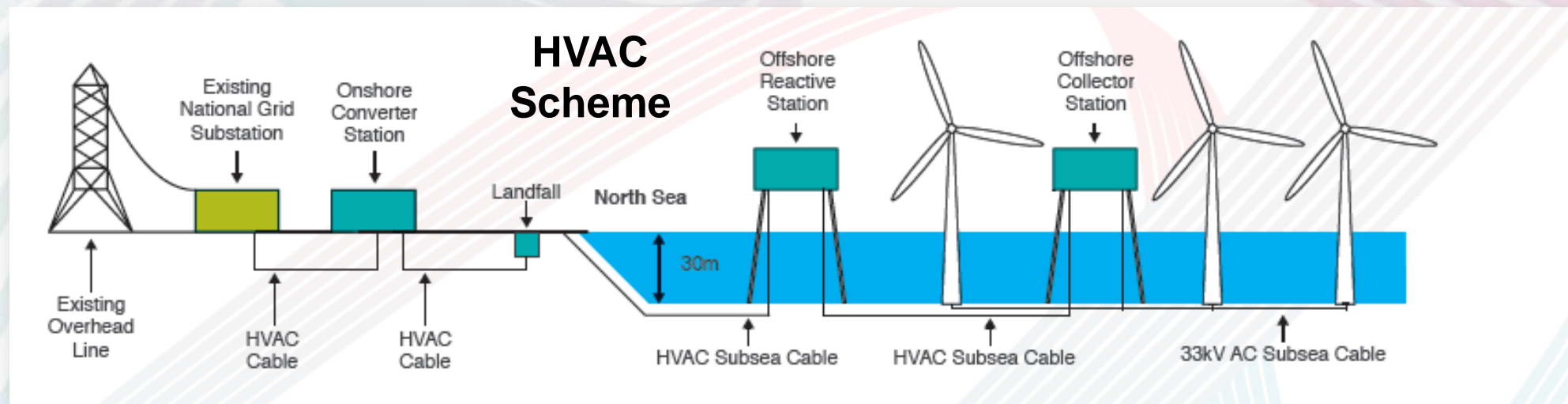
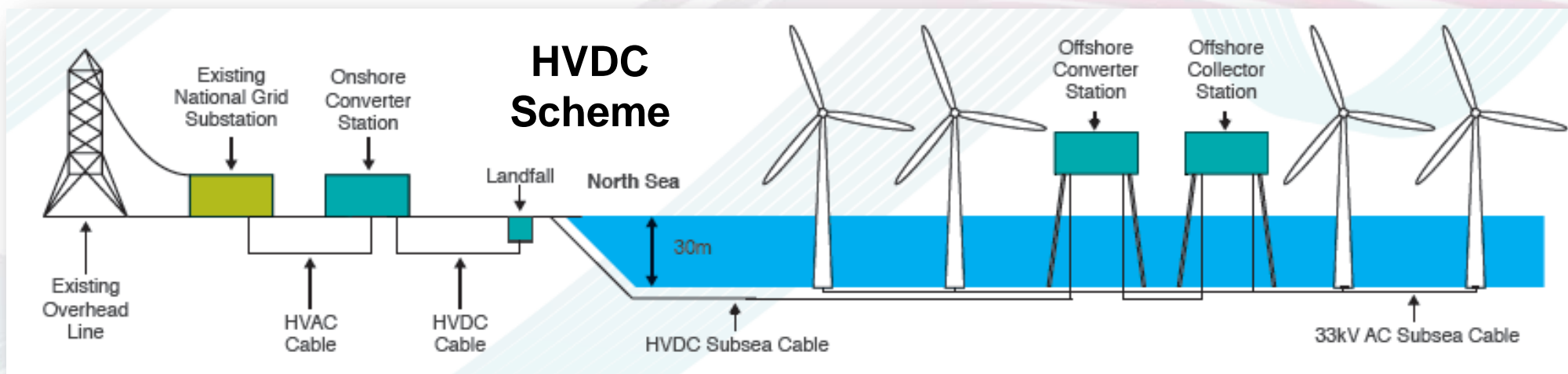


**Jacket**



**Gravity**

# HVAC/HVDC Transmission Options





# 40km Onshore Buried Cable Configuration

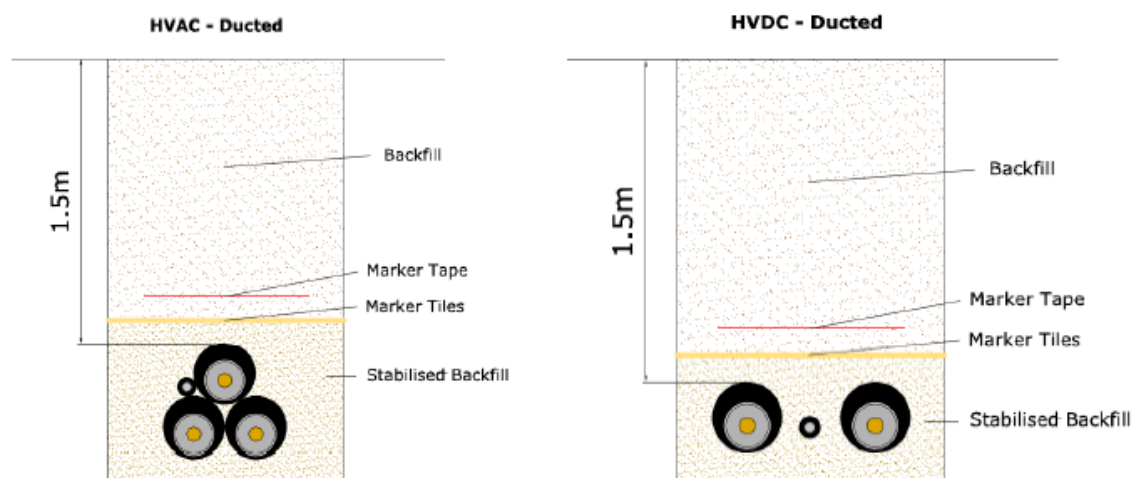


Figure 3.18 Indicative onshore cable trench (HVAC and HVDC).

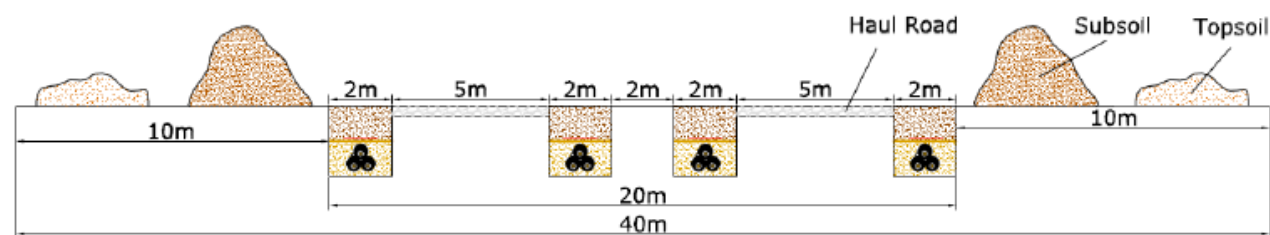
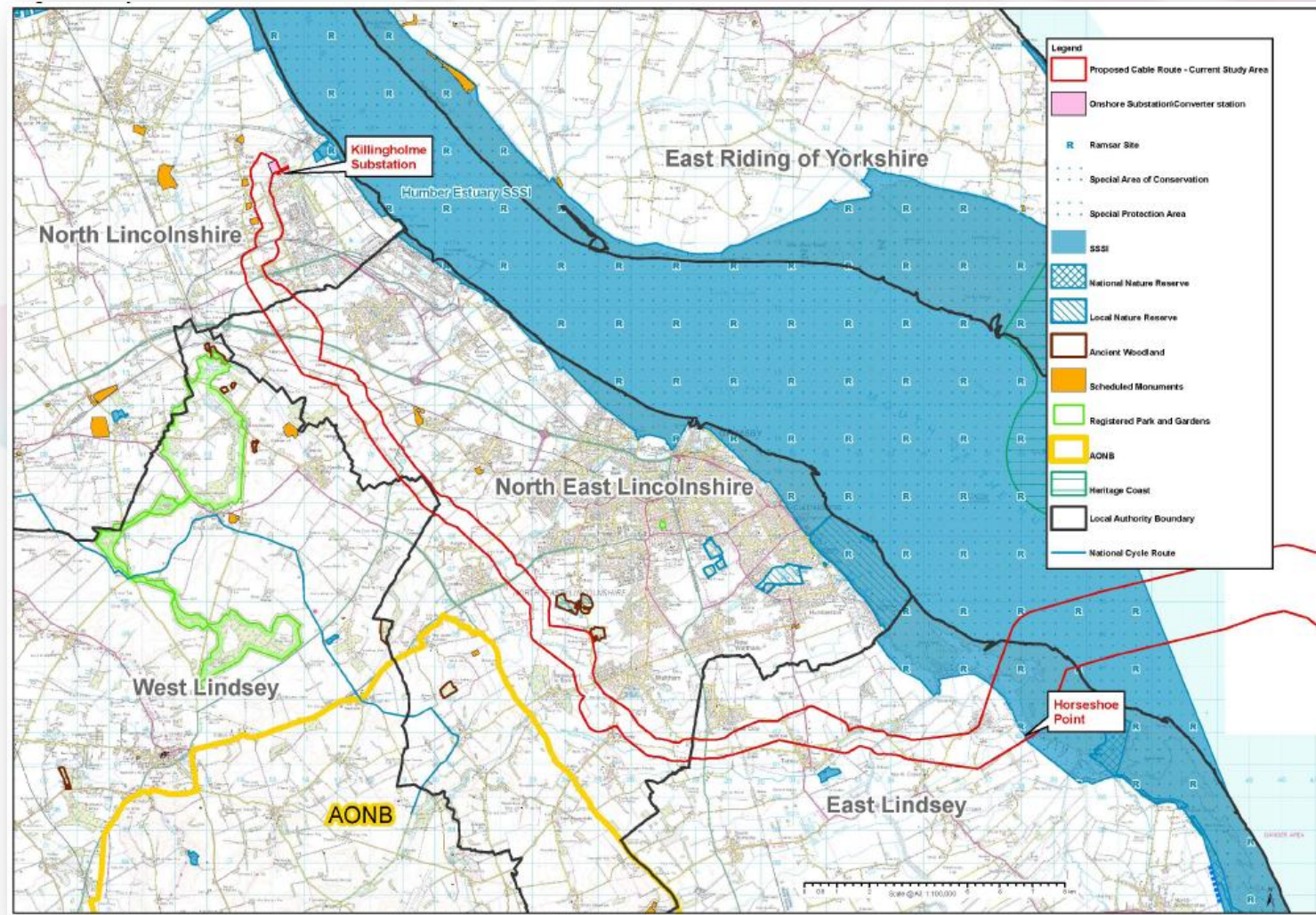


Figure 3.19 Indicative cable construction corridor.

# 40km Onshore Buried Cable Route





# HVDC/HVAC Substation Consultation

- The detailed design of the converter station has not yet been confirmed but the maximum dimensions are 180m length x 146m length with a building up to 24m in height.
- There will also be an additional landscaping buffer to mitigate any potential visual impacts of the building.



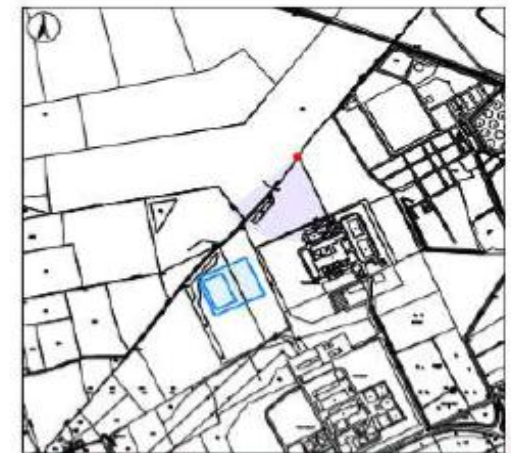


# Converter Station Location

Site A



Location Plan





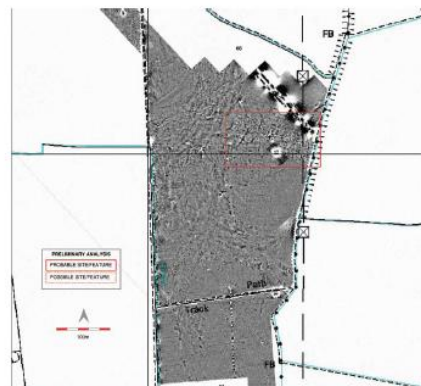
# Onshore Environmental Survey Activity



Pink Footed Geese (Migratory Birds most likely found in the coastal area.)



Geophysics survey in progress



Geophysical survey of cable route near Laceby showing feature of possible archaeological significance



- Great Crested Newts
- Breeding Birds
- Extended Phase 1 Habitat
- Intertidal Habitat Survey
- Badger
- Noise
- Bats
- Otter
- Hedgerow
- Water vole
- Reptile Habitat
- Archaeology
- Traffic & Transport
- Landscape & Visual
- Wintering & Migratory Birds
- Soils





# Hornsea Offshore Survey Activity 2012





# Windcube Lidar – Schooner and Babbage Platforms





# Project Information

**SMart Wind Website – [www.SMartWind.co.uk](http://www.SMartWind.co.uk)**

- Online questionnaires
- Sign up to email updates
- Fortnightly Notices to Mariners
- Environmental reports for download
- Project Update brochures for download

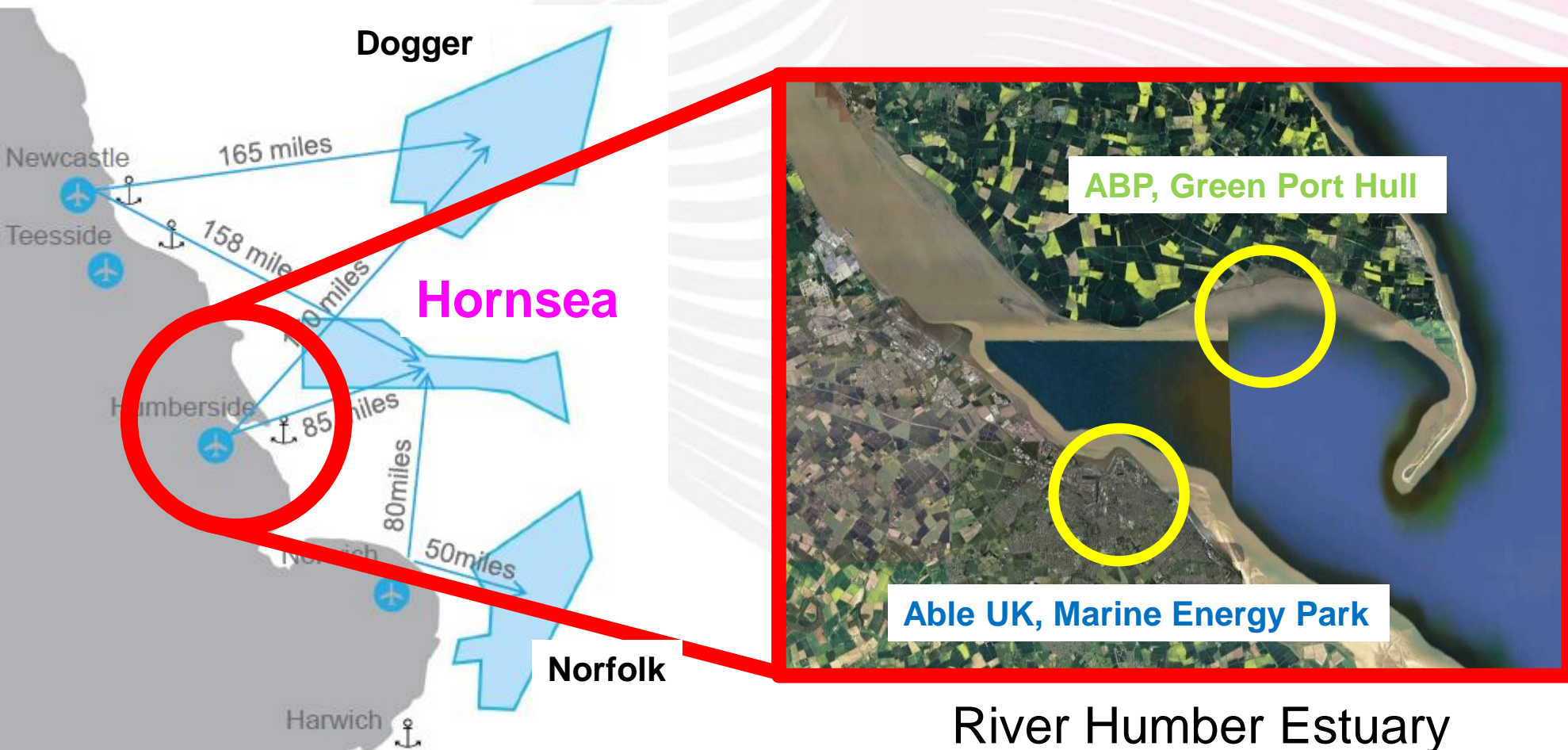
**Phase 4 Consultation Events – completed in Q1**

- 42 day consultation period
- 8 local events open to members of the public



# Other Progress on Industry Building

Strategic Relevance to Round 3 Projects of Port-side Infrastructure



River Humber Estuary



# GreenPort Hull – Associated British Ports & Siemens

Unanimous Approval at Planning on 9<sup>th</sup> May 2012



Indicative artist's impression





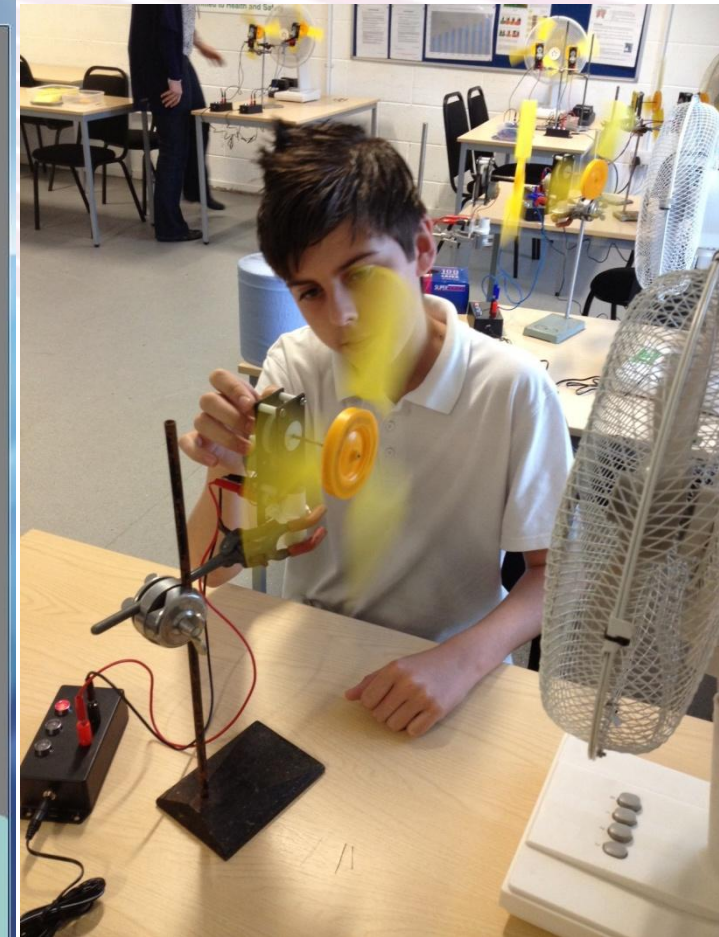
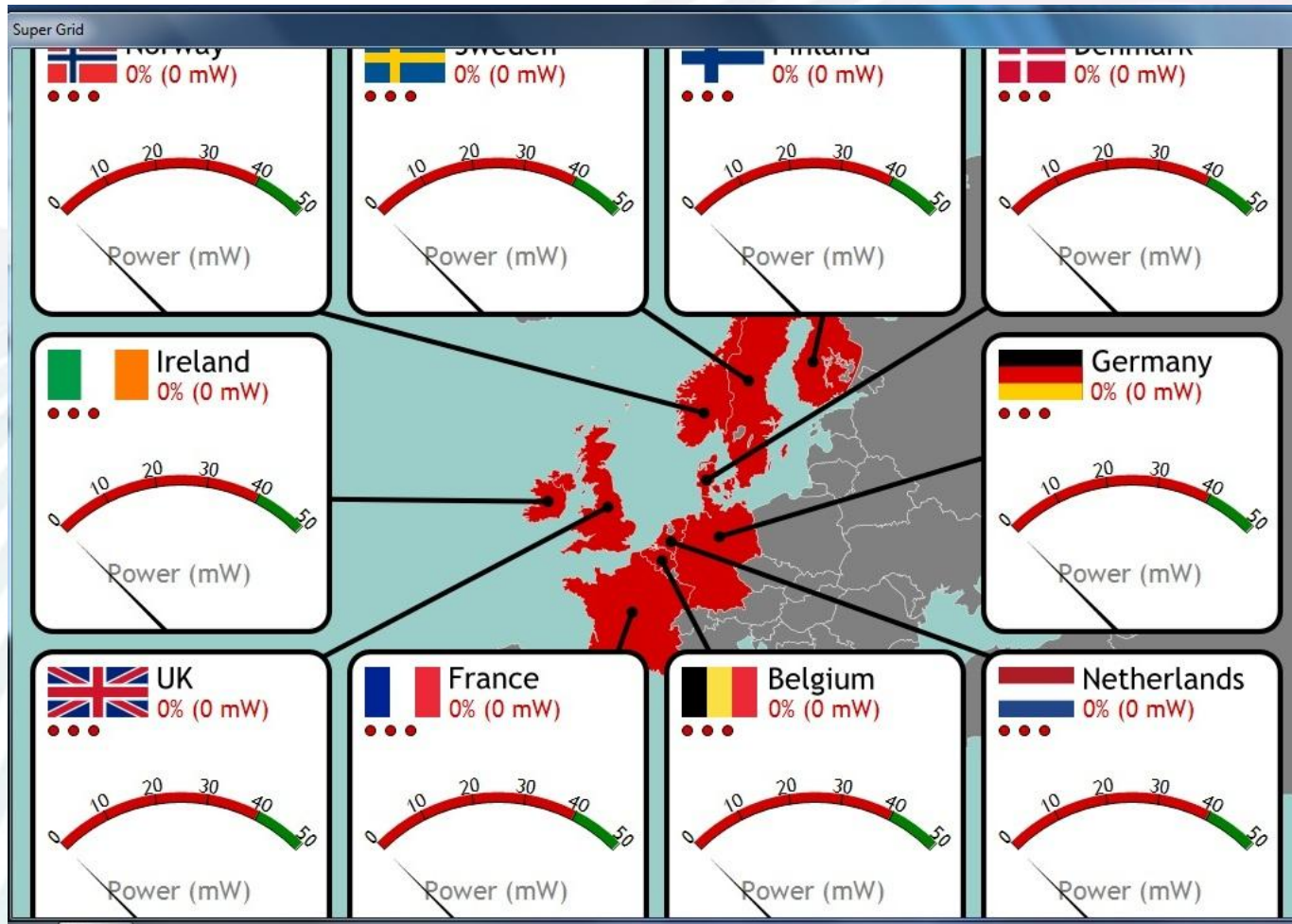
# Marine Energy Park – Able UK

Planning Inspectorate Decision Imminent



# SMart Futures Supergrid

Schools' Programme focussed on *Science, Technology, Engineering & Maths*





**HETA**

RENEWABLE  
ENERGY  
APPRENTICESHIP  
FORMADE FOR

Scunthorpe  
Stalling

SMart  
utures

Sustainable energy is bringing  
a range of career opportunities

A career in renewable energy is  
one of the best ways to make a real  
difference in combating  
climate change and environmental  
pollution. It's also one of the fastest  
growing job markets in the UK  
with solid job opportunities  
comparable with the best in the  
country.

Within the next five  
years, energy in  
the UK will be





# AREVA Tour - Exchange Programme to Bremerhaven







# Delivering a New Energy

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RECYCLED PAPER

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RENEWABLE  
POWER

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[smartwind.co.uk](http://smartwind.co.uk)

SMart Wind Ltd. is a joint venture between Mainstream Renewable Power and Siemens Project Ventures GmbH