



renewableUK

Marine Cables Seminar

London, 7th October 2010

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.....The Smart Wind Consortium, a joint venture between Siemens Project Ventures, of Germany, and Ireland's Mainstream Renewable Power, has secured the link for the project, which is designed to produce a maximum of 4,000 megawatts of electricity — enough to power up to three million homes or 4 per cent of total UK demand.....



The logo for SMart Wind features a stylized graphic of a wind turbine or a series of curved lines in shades of red, orange, and yellow, resembling a fan or a turbine blade.

SMart Wind

SIEMENS

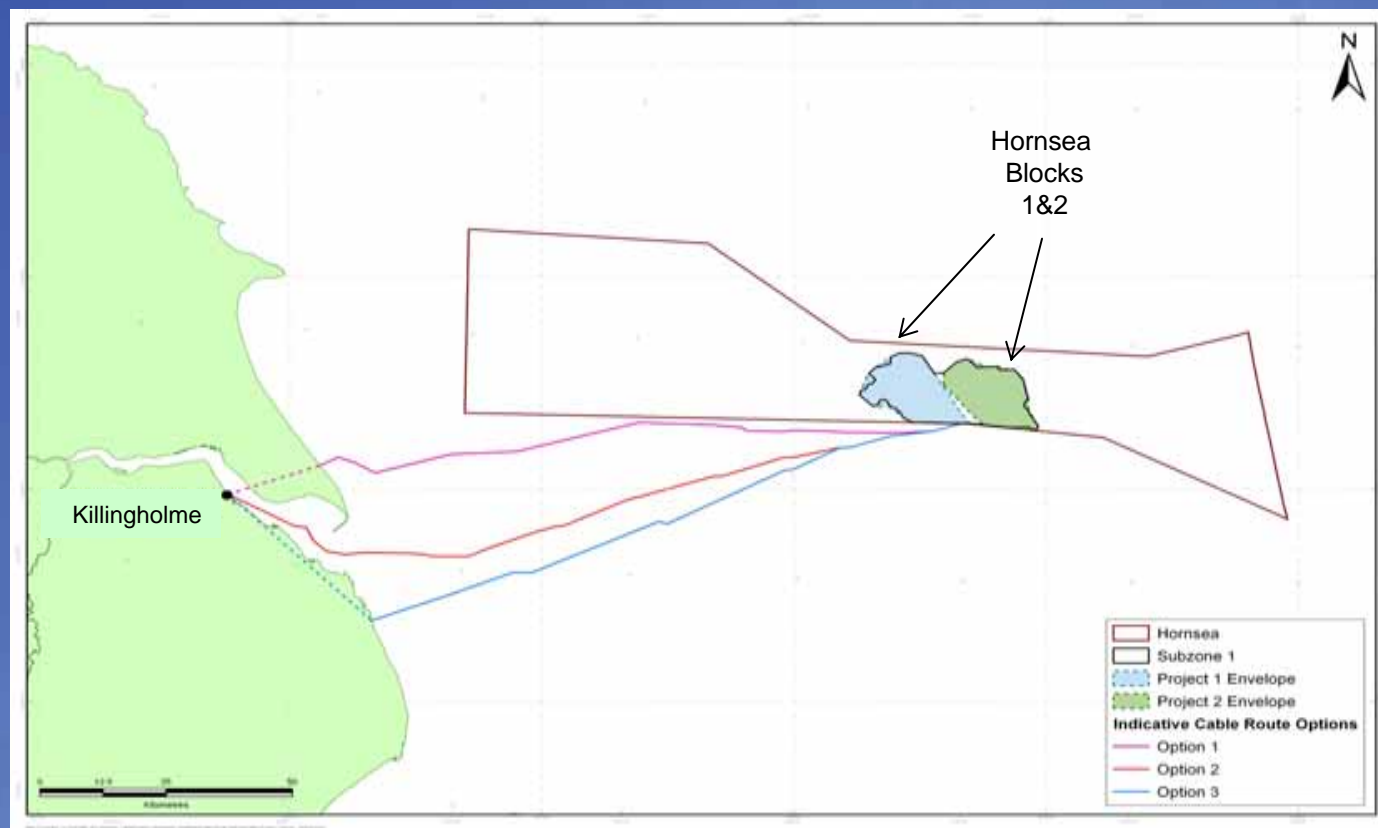
- The world's leading environmental company with total revenue in 2008, €19bn from its environmental portfolio
- To maintain its Number 1 position in UK offshore wind energy



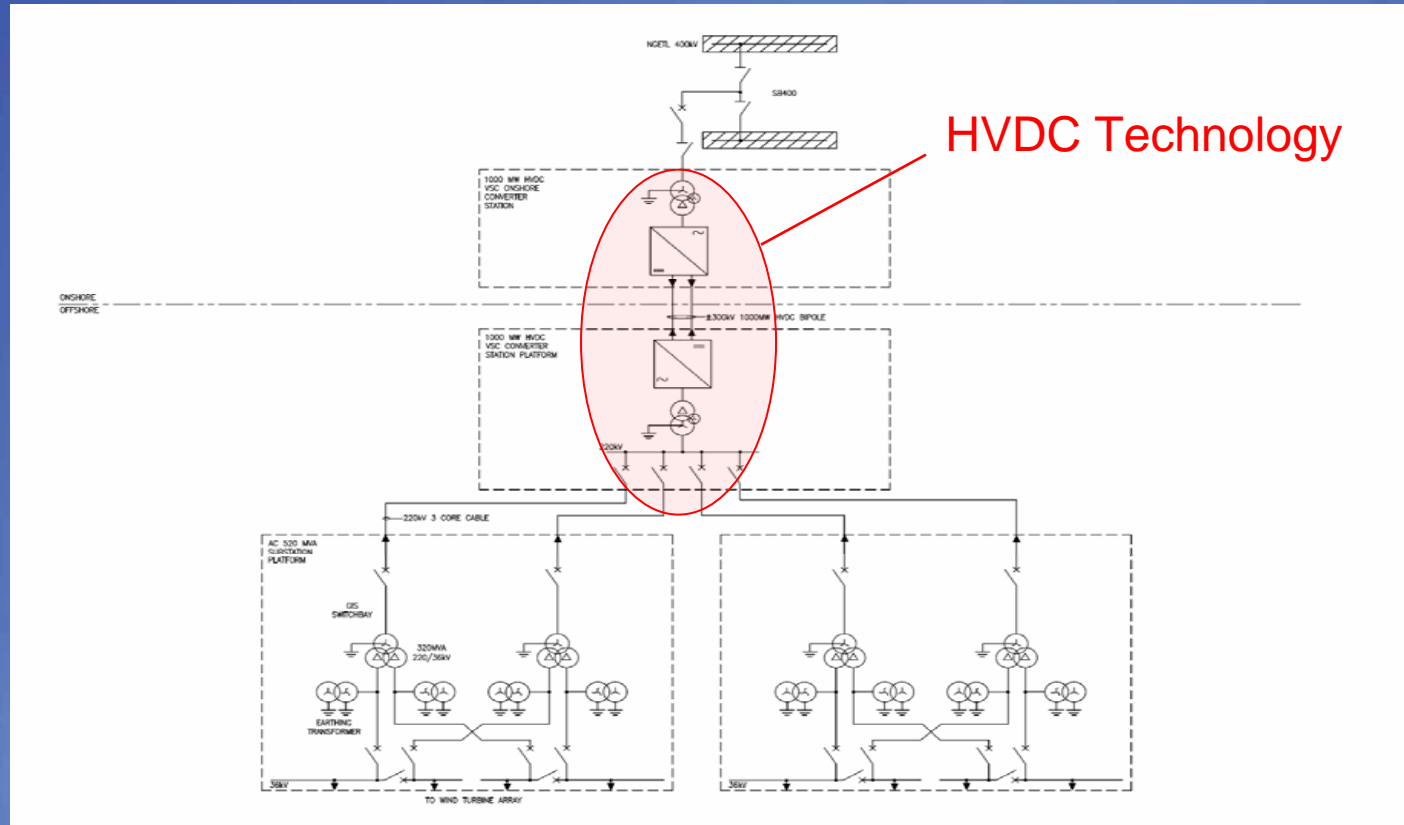
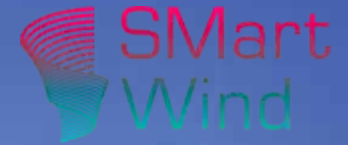
- A leading developer of large scale renewable energy projects that accelerate global progress towards a sustainable future
- To make the UK the powerhouse of Europe by accelerating and maximising offshore wind delivery and realising the Supergrid



1GW Grid Connection

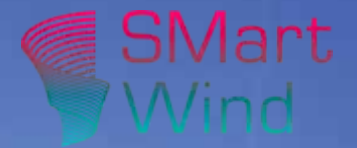


1GW Schematic Representation



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HVDC Cables



HVDC Converters

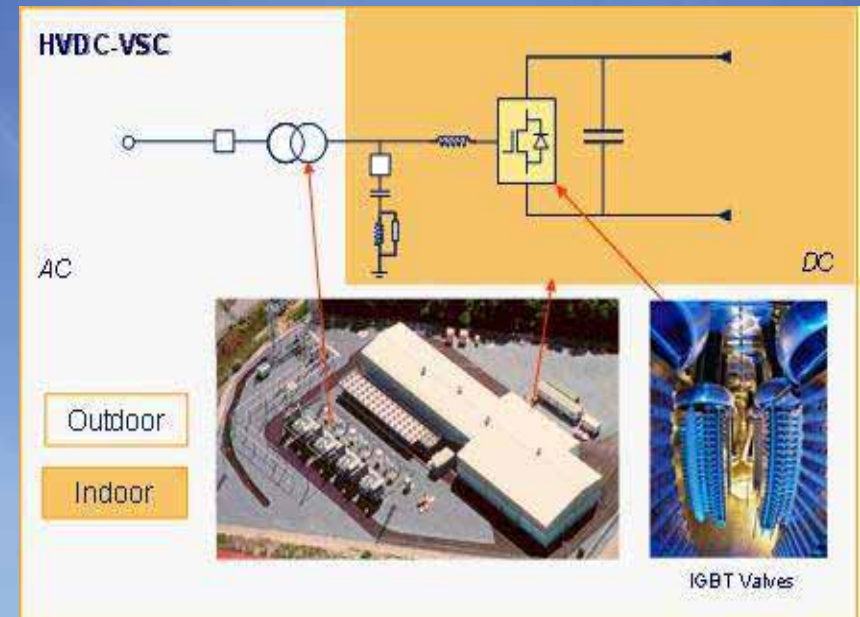


HVDC (LCC)

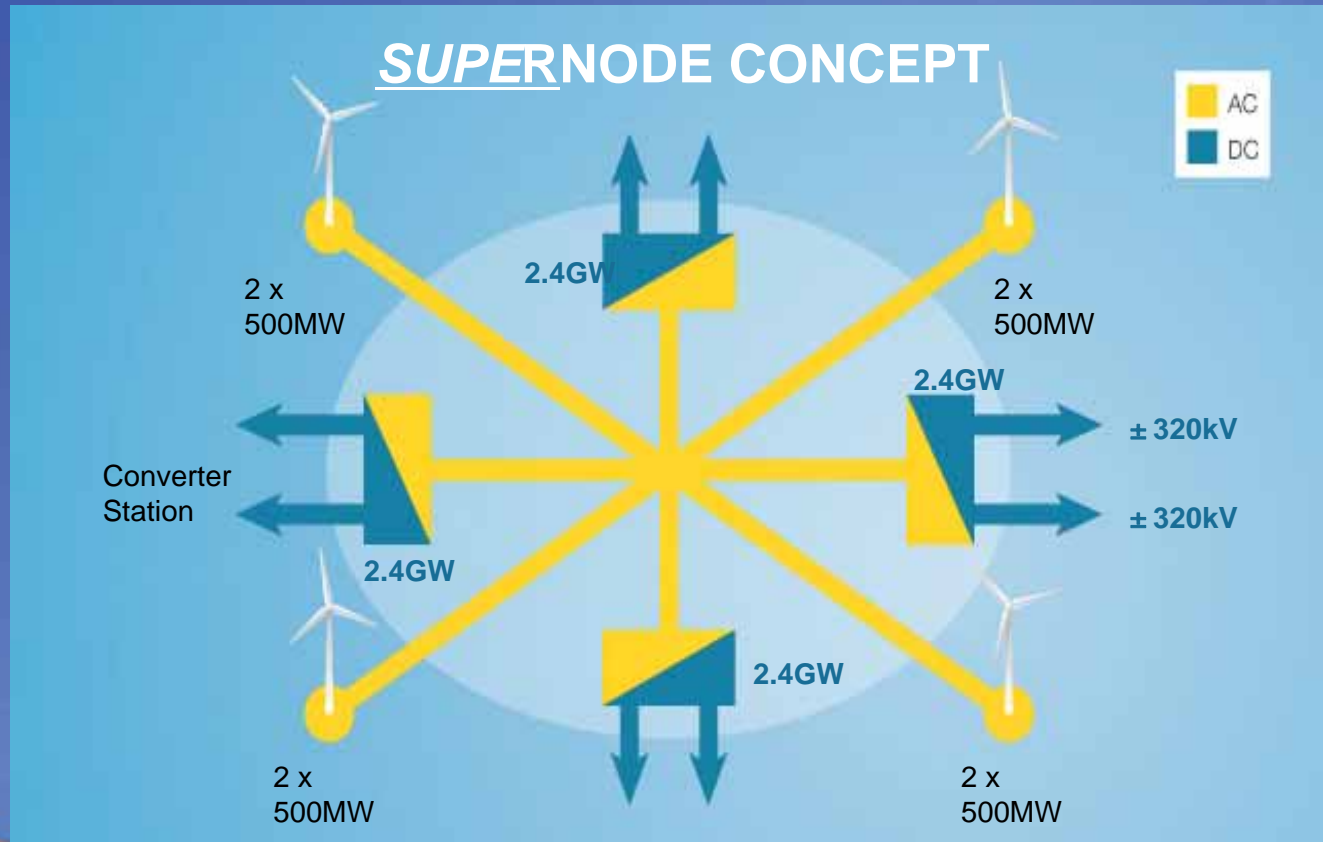
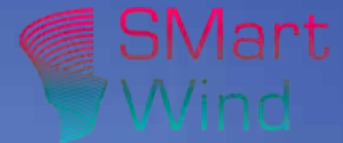
- Current source converters
- Line-commutated thyristor valves
- Requires 50% reactive compensation
- HVDC Converter transformers
- Minimum short circuit capacity > 2x converter rating

HVDC (VSC)

- Voltage source converters
- Self-commutated IGBT valves
- No minimum short circuit capacity
- Requires no reactive power compensation
- Standard transformers
- black start



Supergrid – the building blocks



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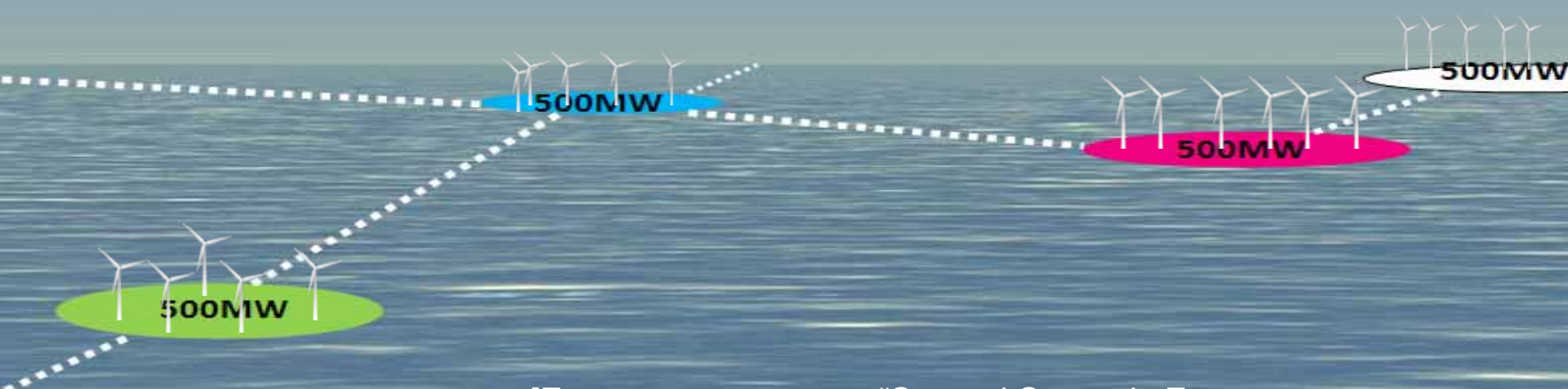
Supergrid

An electricity transmission system, mainly based on **direct current**, designed to facilitate **large scale sustainable power generation in remote areas** for transmission to centres of consumption, one of whose fundamental attributes will be the **enhancement of the market in electricity**.



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*“.....a **Blueprint for a North Sea offshore grid should be developed to interconnect national electricity grids in North-West Europe together and plug-in numerous planned offshore wind projects. It should become, together with the Mediterranean Ring and the Baltic Interconnection project, one of the building blocks of a future European supergrid.**”*



[European Commission “Second Strategic Energy Review – An EU Energy Security and Solidarity Action Plan”]

Supergrid

Enablers

(or barriers?)

- Technology
- Supply Chain
- Policy & Regulatory Framework
- Government Support
- Finance



Technology

HVDC

- HVDC
- DC Circuit Breakers
- Control & Protection Systems
- Standardisation / Interoperability



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Research, Design & Development

EU Commission

- FP6/7, WEETP

UK Government

- Carbon Trust OWA
- Marine Renewables Deployment Fund
- DTI & Research Council



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Supply Chain

- Ports
- Vessels
- Manpower & Training
- Turbines
- Offshore Platforms
- HVDC Cables & Converters
- Onshore Grid
- O&M



Policy & Regulatory Framework

- EU Directives
- EU Commission
 - Energy Security & Infrastructure Instrument
- ERGEG
- ACER enabling?
- ENTSO-E
 - 10-Year Transmission Development Plan
 - National Development Plans
- Maritime Spatial Planning



Questions?



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