SSE Renewables

Offshore Wind Energy Supply Chain Opportunities

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SSE Renewables - Who are we?

30th largest company in the FT-SE 100	
Electricity & Gas Networks	£4.7bn RAV 2nd largest
Energy Supply (GB & Ireland)	9.2 million customers 2nd largest
Generation (UK)	Over 11,000MW 2nd largest
Renewable Generation (wind, marine hydro, biomass)	Largest in the UK Over 2,300MW **Over 450MW in operation in Ireland**

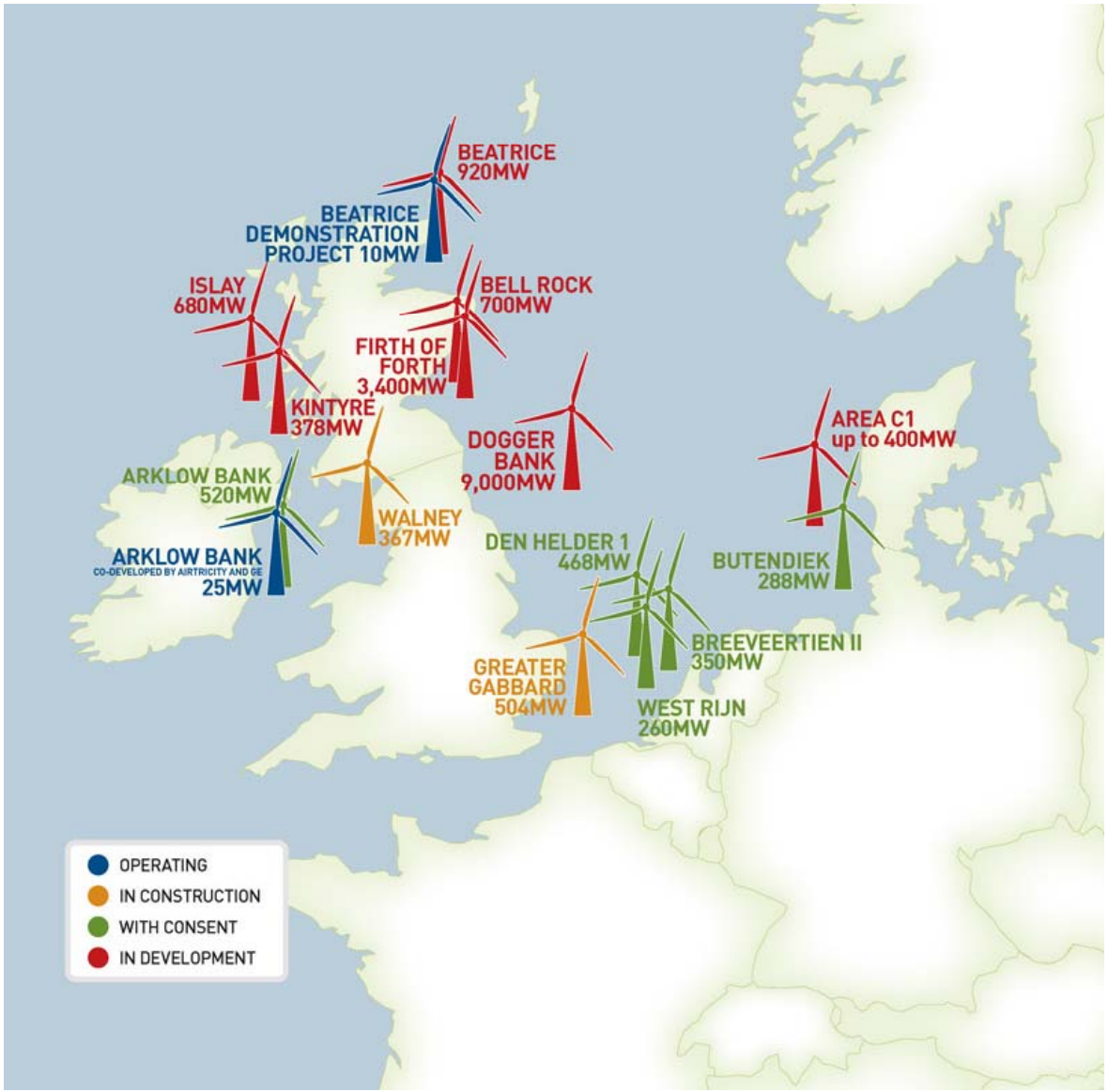
Safety **Service** **Efficiency** **Sustainability** **Excellence** **Teamwork**

Our Response to Key Energy Questions

504MW Greater Gabbard in construction

1. How do we respond to climate change?
   - Reduce the carbon intensity of our electricity generation by 50% by 2020
2. How do we address the dilemma of rising global demand for energy with depleting oil and gas supplies?
   - Build one of Europe's largest renewable portfolios Wind, Hydro, Marine, Solar and Biomass
3. How do we secure energy supplies and make them more reliable?
   - Focus on a European platform that maximises local sustainable energy sources
4. **Delivering Offshore Wind is a key part of the solution**

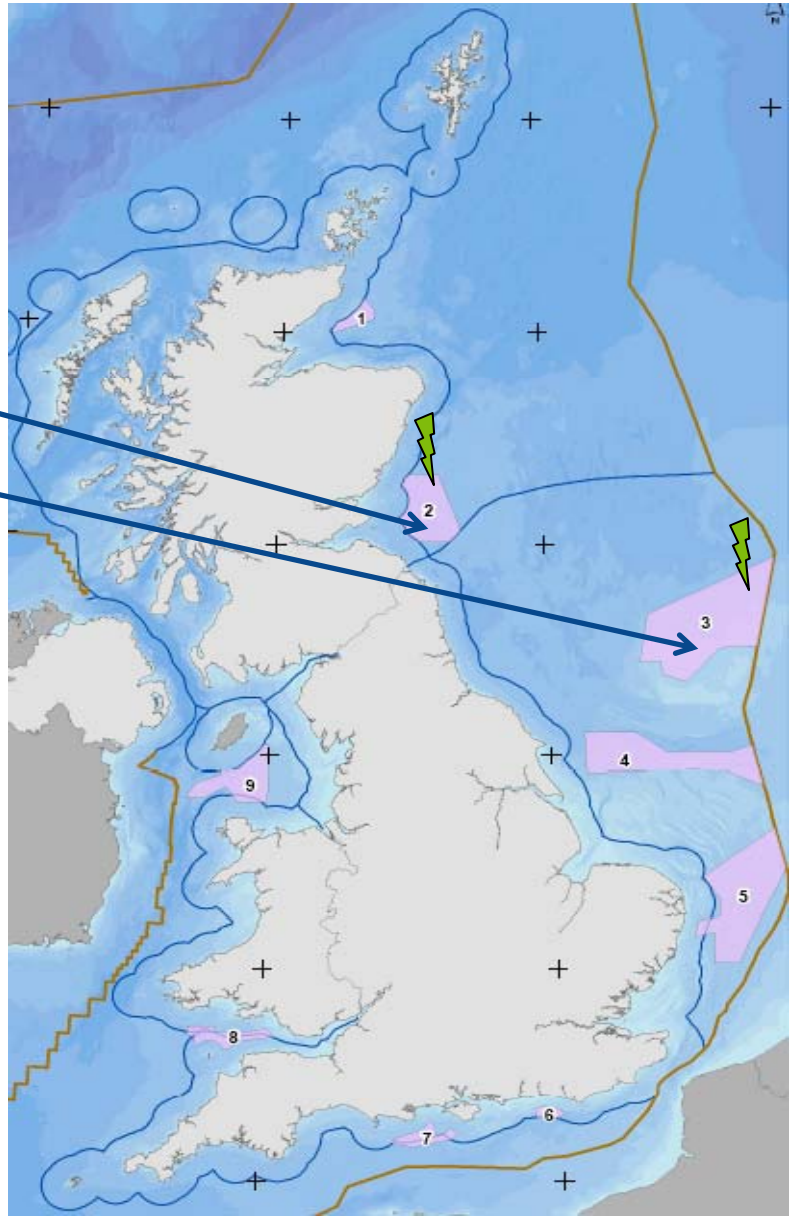
SSE Markets - Offshore



Pipeline of
8 GW
of which
1.5 GW
is consented

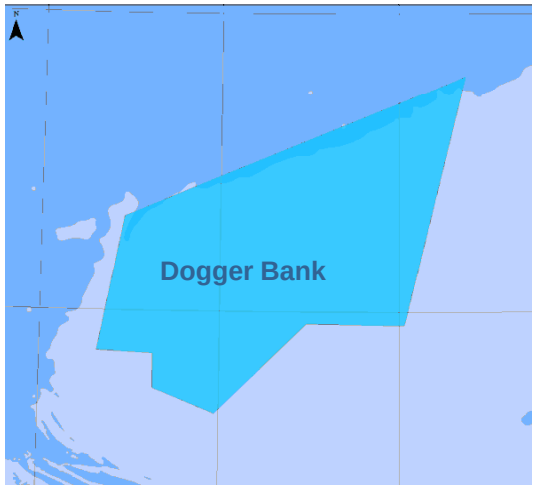
UK Round 3 – A step change

Zone	Name	Developer
1	Moray Firth	Moray Offshore Renewables Limited
2	Firth of Forth	Seagreen Wind Energy Limited
3	Dogger Bank	Forewind Limited
4	Hornsea	SMart Wind Limited
5	East Anglia	East Anglia Offshore Wind Limited
6	Southern Array	E.on Climate & Renewables UK Southern Array Limited
7	West Isle of Wight	Eneco Round 3 Development Limited
8	Atlantic Array	Bristol Channel Zone Limited
9	Irish Sea	Centrica Energy Renewable Investments Limited

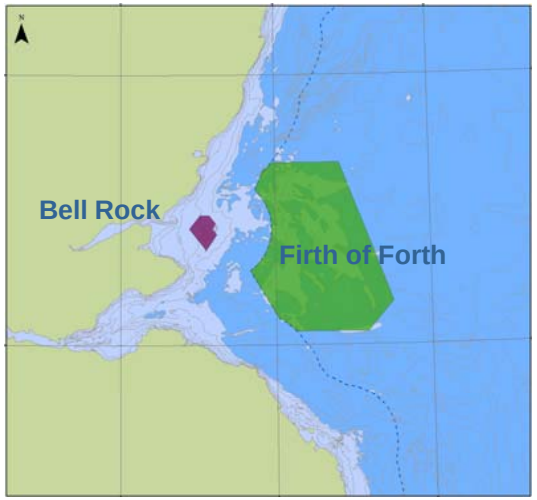


SSE Renewables and JV Partner projects

UK Round 3 Timeline – A clear timeline for delivery



DOGGER BANK	
CAPACITY [MW]	9,000
MIN. DISTANCE TO SHORE [km]	123.3
MAX DISTANCE TO SHORE [km]	289.9
WATER DEPTH	<50 m



FIRTH OF FORTH	
CAPACITY [GW]	3.4
MIN. DISTANCE TO SHORE [km]	23.3
MAX DISTANCE TO SHORE [km]	75.6
WATER DEPTH	> 50 m

Zone Award — 2010

Consent Application

Consent

Design

Procurement — 2014

Financial Close

2015

Start Offshore

2016

Commissioning

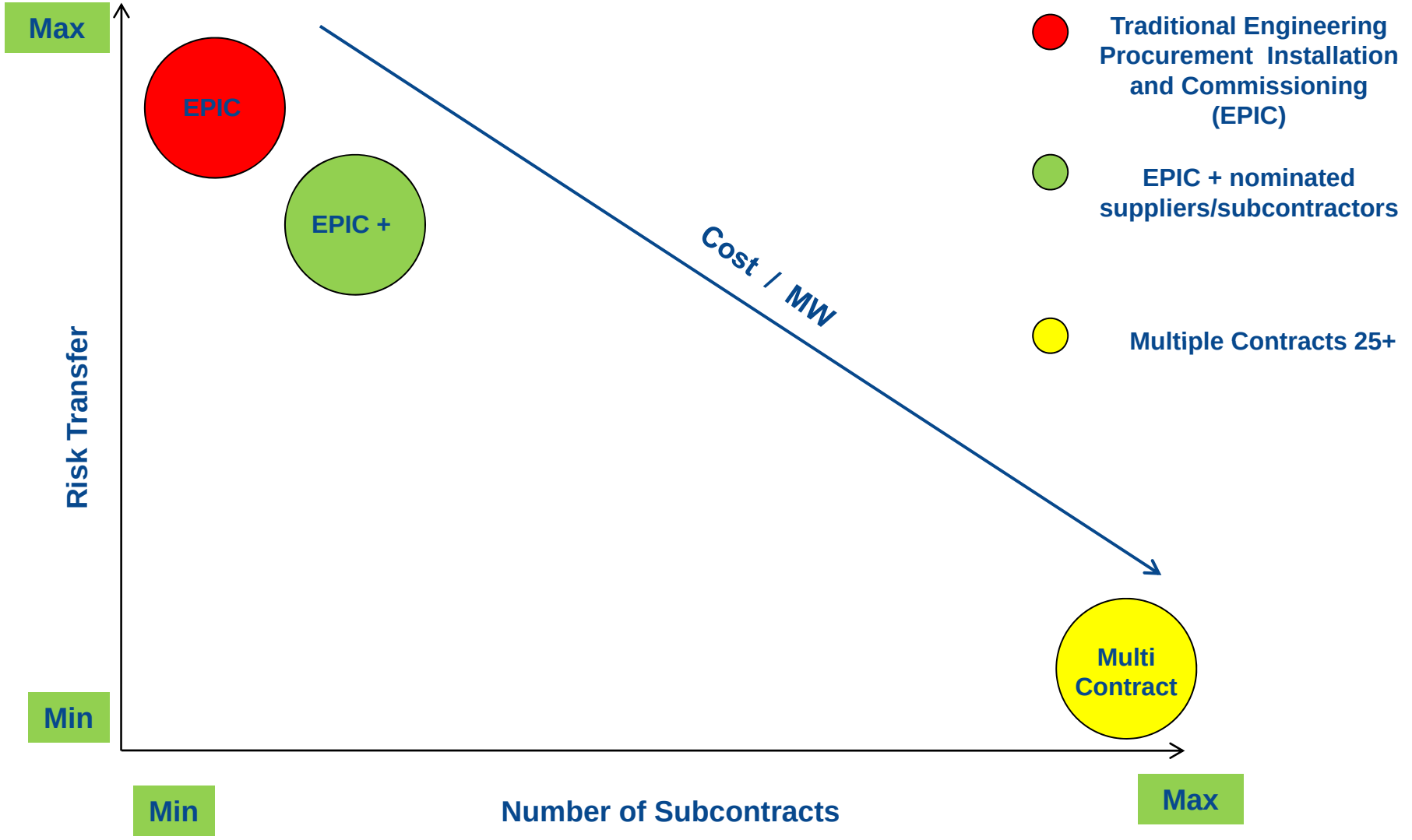
Operation

What does this mean for potential suppliers?

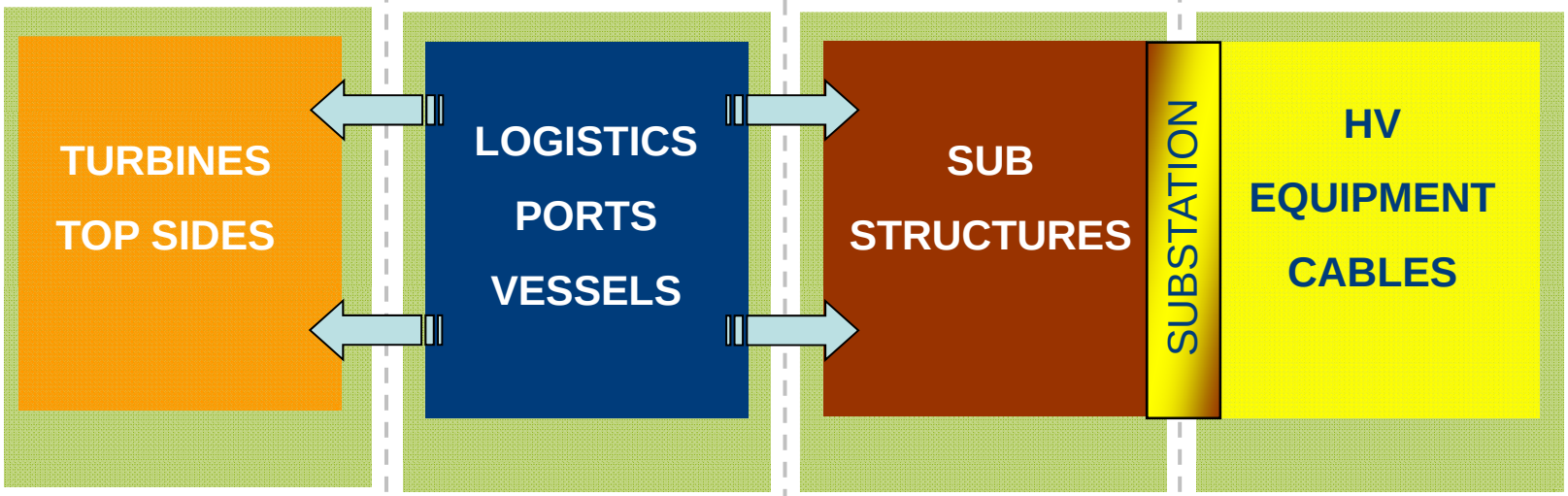
An Example:

Systems	A Generic 500 MW project would consist of	Scaling up to a new 25 GW power system for 2020 potentially suggests
Wind Turbines	140 x 3.6 MW	~ 5,000 x 5 MW
Foundation Substructure	140 driven mono piles or prefabricated jacket structures	~ 5,000 driven piles or prefabricated jacket structures
Cable installation	Shore connection – 25 km of 132 kV - 900 mm^2 cable Array - 200km of 33kV - 400mm^2 cable	Shore Connections -1,250 km + Inter Array cables - 10,000 km +
Electrical System	Balance of Plant – Transformers, Protection Systems, Reactive Compensation	Scaling up in electrical systems
Substations	Offshore – two platform / jacket structures Onshore – One Substation	Offshore -100 Platform /Jacket Structures Onshore – 50 Substations +
Controls	Two SCADA systems one for the turbines and one for the rest of the system	100 integrated SCADA systems

Offshore Wind Contract Types and Cost per MW Correlation



Potential Supply Chain Packages



Each package consisting of an Onshore and Offshore Element

Can Ireland's Green Economy service this market?

The Vision

"……an innovative, high-value export-led economy with some of the world's leading research-intensive multinationals and thousands of innovative small and medium enterprises...."

The Offshore Wind Supply Chain is Irelands smart green economy in action