The Composites Engineering Show 2012
7-8 November • NEC Birmingham
Aero Engineering 2012
The Aerospace Engineering Suppliers Fair & Congress
7-8 November • NEC Birmingham • UK
Automotive Engineering 2012
7 – 8 November, NEC Birmingham
UK Plastic Electronics Show 2012
Organic & Printed Electronics Trade Show & Industry Briefing
7-8 November • NEC Birmingham • UK

Opportunities in the Sustainable Energy Value Chain: Offshore Wind

Advanced Engineering 2012

6 November 2012, Birmingham

Bruce Valpy

Wind Power Engineering Showcase
Advanced Engineering UK 2012

BVGassociates

Opportunities in offshore wind

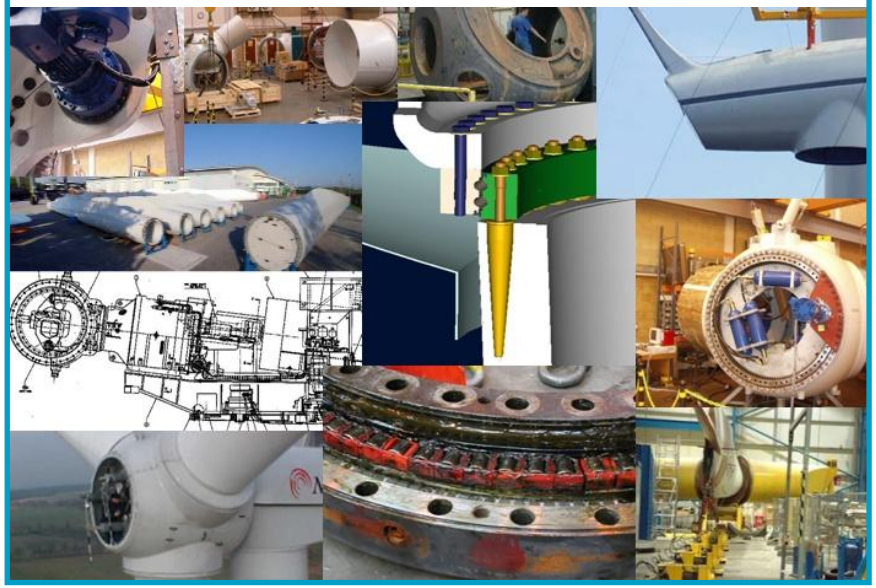
Introduction

Today

- Intro
  - Useful information
  - Big technology
- Market status
  - Why offshore wind?
  - UK offshore wind market
  - Other offshore wind markets
  - Future demand
  - Supply
  - Cost reduction
- Supply opportunities
  - Market structure
  - Typical project plan
- R&D funding

BVG Associates: technical and market consultancy

- Market analysis and business development
  - Supply chain development
  - Entrance strategy
  - Support to industrialisation
- Technical innovation & engineering analysis
  - Support to investment in technology
  - Design and engineering services
- Project implementation
  - SCADA & condition monitoring
  - O&M technical support



Opportunities in offshore wind

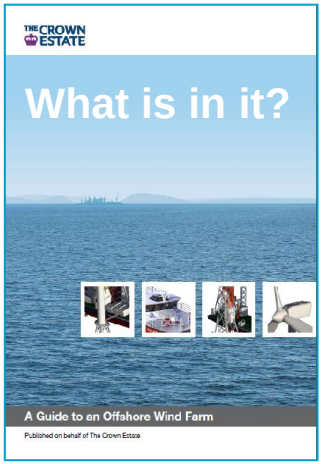
Wind and marine renewables is our domain

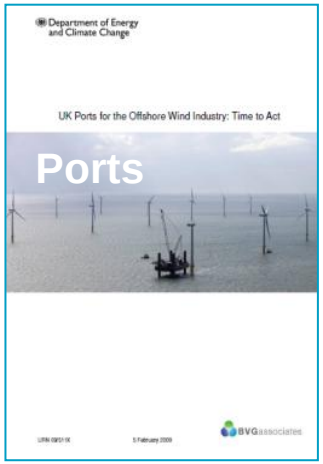
Customers

Useful information

New and dynamic industry

Free information





All available **free** from **bvgassociates.co.uk** or RenewableUK

Len Rogers Collection

Len Rogers Collection

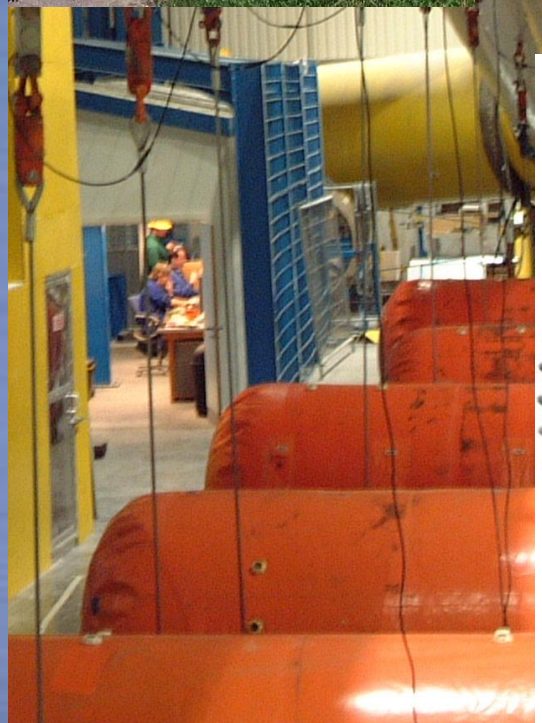
Len Rogers Collection

Len Rogers Collection


RAMBIZ
SAINSBURY'S
FODEN
4340
R686 AMX
Sainsbury's
making life taste better
Len Rogers Collection


Sainsbury's
making life taste better


Street



Why offshore wind?

Offshore wind is the large scale low carbon energy technology of choice for UK

Onshore wind	Offshore wind	Nuclear	Carbon capture and sequestration
13GW by 2020	18GW by 2020	16GW by 2030	10GW by 2030
£0.8bn value	£15bn value	£60bn value	c£18bn value
c. 30-50 developers	c.13-17 developers	c. 3 consortia	5-10 consortia
Up to 12,000 jobs	Up to 70,000 jobs	Up to 30,000 jobs	Up to 100,000 jobs
Maturing technology, cost reduction dominates; planning/public acceptability	Innovation, technical challenge dominate the sector	Mature technology. Safety and regulatory compliance dominate	Maturing technology with UK based developers. £1bn capital committed

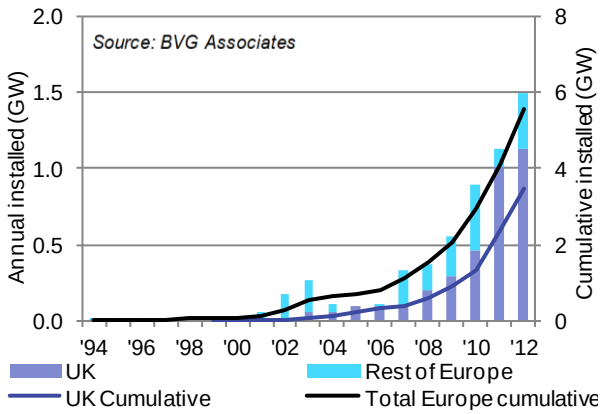
Source: BIS, 2012

BVGassociates

UK offshore wind market

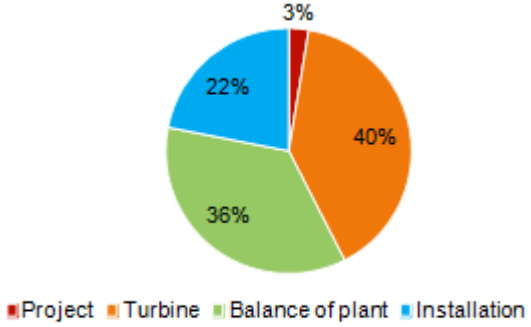
UK is the world leader in offshore wind

EU Offshore wind market



Demand headlines

- 34% CAGR (last 8 years)
- Comparable to global onshore wind during growth of 1990's
- UK 60% of global market to date
  - Strongest development frameworks
  - Most consistent demand
  - Best offshore wind resource in EU
- 2012 UK market value £4-5bn



Supply chain characteristics

- Turbine supply dominated by two key suppliers
- Costs risen significantly 2007-2011 – much explainable:
  - Moved to deeper water, further from shore, higher winds
  - Little competition
  - Exchange rate – continental supply
  - Commodity prices
- Cost of energy reduced due to higher wind resources
- Low margins compared to investment and risk - and hence business failures
- Industry moved from single EPC contract to multi-EPC – moving towards alliancing

Other offshore wind markets

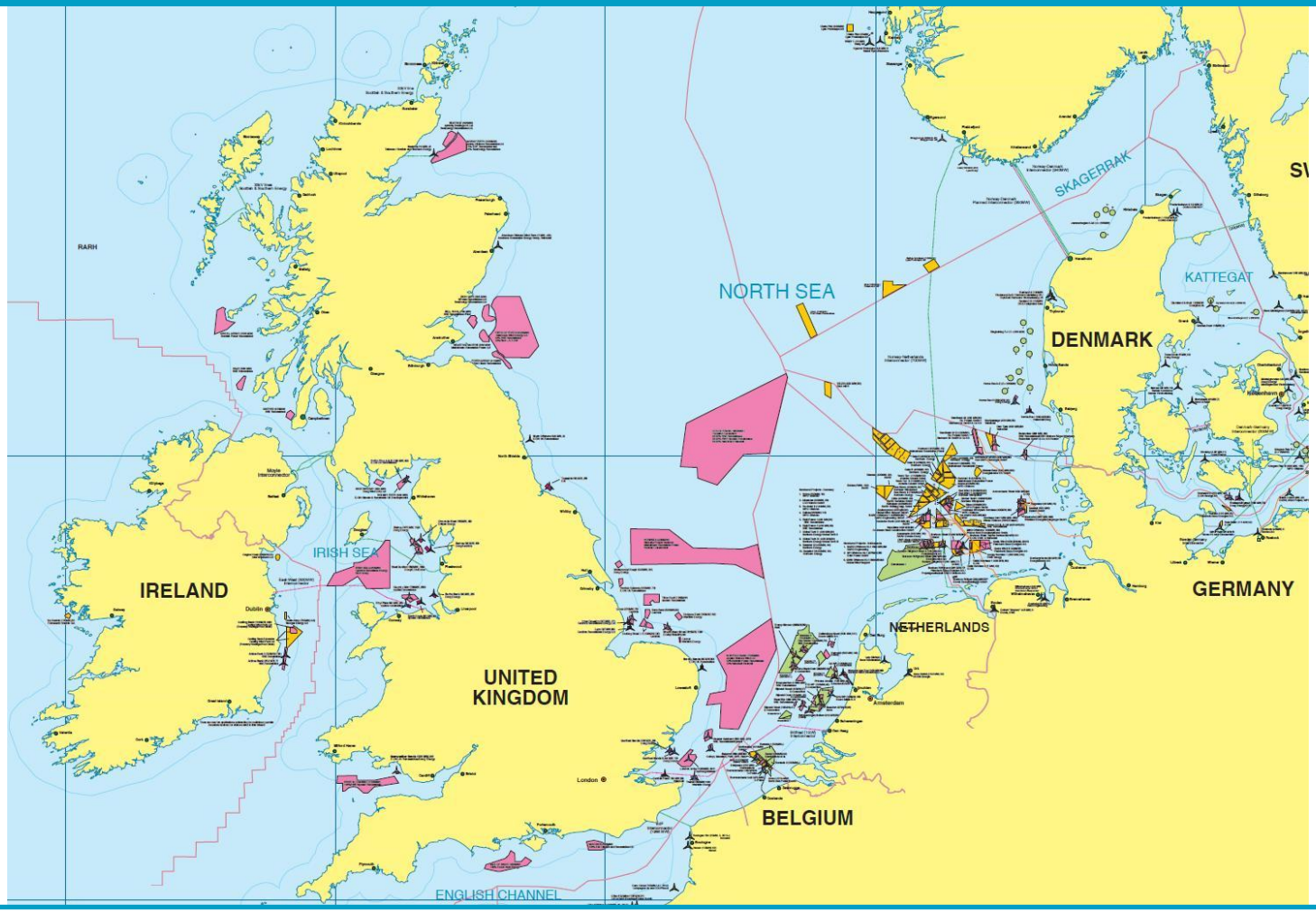
UK is not the only one to have big plans and see the opportunity

Germany	Denmark	France	China
10GW by 2020	2GW by 2020	4GW by 2020	25GW by 2020
Advanced supply chain and high demand for new renewable capacity	Advanced supply chain and high demand for new renewable capacity	Centrally driven and big industrial players on board	Plans for rapid grow and unrivalled manufacturing capacity
Grid connection and financing challenges	Lower potential	Starting late and delays to early leasing rounds	

Northern Europe

Need to look beyond UK

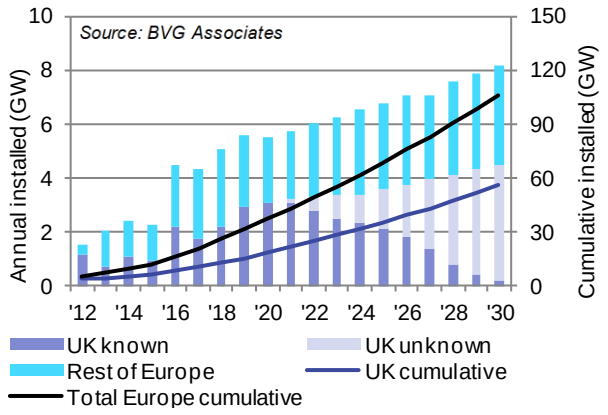
Northern European supply and demand



Future demand

Little consensus on demand

EU offshore wind market forecast: positive scenario



Background

- Demand to 2015 mainly contracted
- Demand to 2020 lower than some trade body forecasts
- Demand post 2020 combines known projects and anticipated future licensing rounds
- Designed to be realistic and facilitate healthy UK sector
- Depends on industry cost reduction AND political support

Supply chain challenge

- UK dip in 2013
- Little installation growth until 2016
- Overall equivalent to 16% CAGR (next 8 years)
- Depends on own cost reduction AND political support
- Evolving technology and project conditions

Technology evolution

	2012	2020
Turbine	4MW	6MW
Rotor diameter	120m	155m
Foundation	Monopile	Jacket/Concrete
Array cable	33kVAC	66kVAC
Export cable	245kVAC	HVDC

Changing project conditions

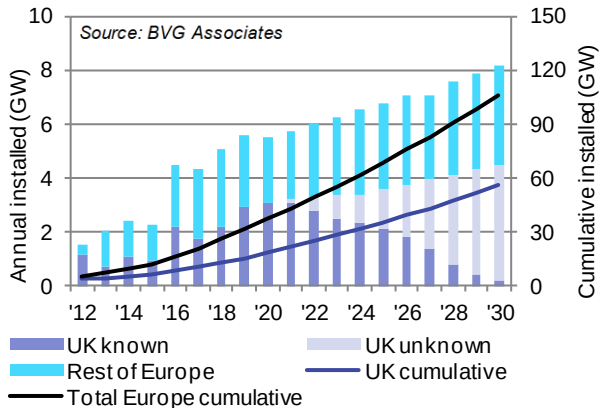
	2012	2020
Project size	300MW	600MW
Water depth	25m	40m
Distance to port	20km	100km
Financing	Balance sheet	Project
O&M	Shore-based	Mother ship-based

BVGassociates

Supply

Key potential bottlenecks

EU offshore wind market forecast

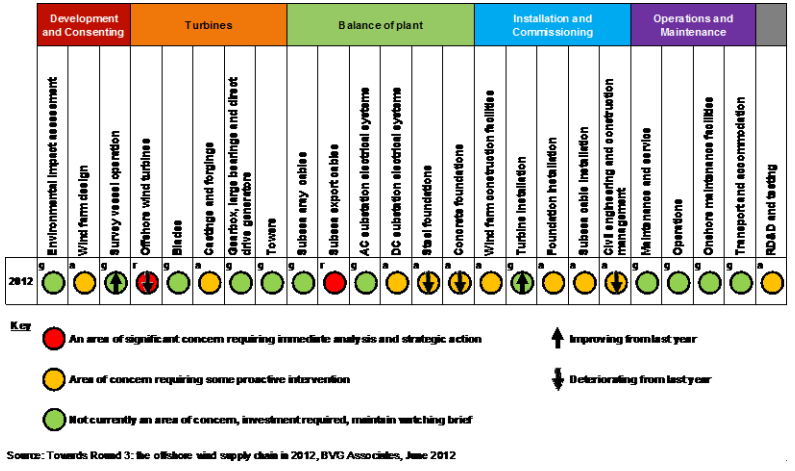


Common messages

- Demand is the problem, not supply
- From continental wind: “can do”
- Sometimes from UK: “I can make higher margins in other sectors - de-risk it for me”
- We have been successful, but now we are empty
- OMS supply chain dynamic different to capital phase

Key potential bottlenecks

	Offshore Wind Turbines	Steel / Concrete Foundations	Export Cables	Foundation Installation Vessels
2009	🔴	🟡🟢	🔴	🔴
2011	🟡	🟢	🔴	🟡
2012	🔴	🟡	🔴	🟡



Cost reduction

Imperative for government support and to stay ahead of other low carbon technologies

Context

- 2011 Energy white paper:
  - Central scenario 13GW by 2020
  - Minded to support to 18GW if cost of energy reduced – target £100/MWh

- The Crown Estate cost reduction pathways study established to evidence what industry thinks could be done
  - Supply chain, finance and technology work streams

- Cost Reduction Task force established to address how to make it happen

Methodology: technology work stream

4 Dimensional cost model: Time, types of wind farm site, turbine sizes, industry scenarios

6 Industry day-long workshops (in UK, DK, DE)

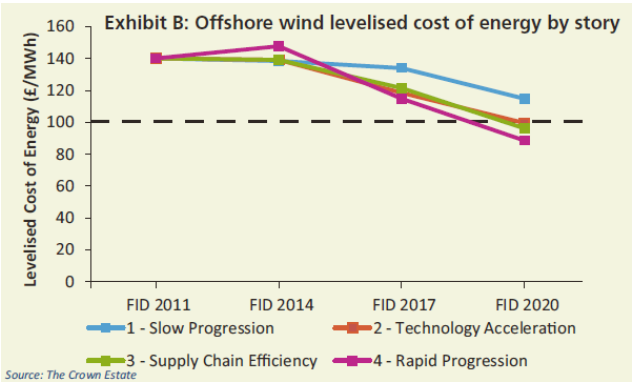
20 Deep industry interviews (4 hours +)

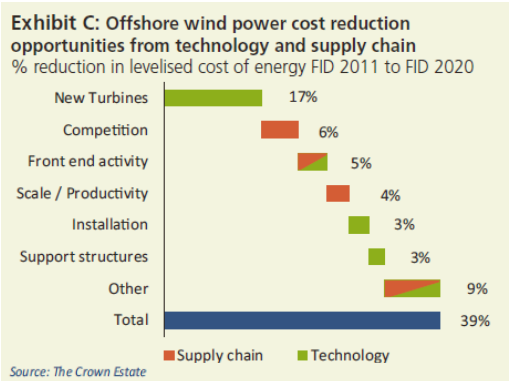
125 Industry individuals directly involved

215 Pages – available for download from our website

Cost reduction pathways study: results

- Given right external conditions, industry can meet target:
  - Confidence in market size to beyond 2020
  - Smooth and timely transition under EMR
  - Planning consent timelines reliably met
  - Clear and predictable offshore grid regulatory framework
  - Facilitation of new technology introduction
- To deliver, industry also needs to work together:
  - Best practice, standardisation, risk management, accessing new finance

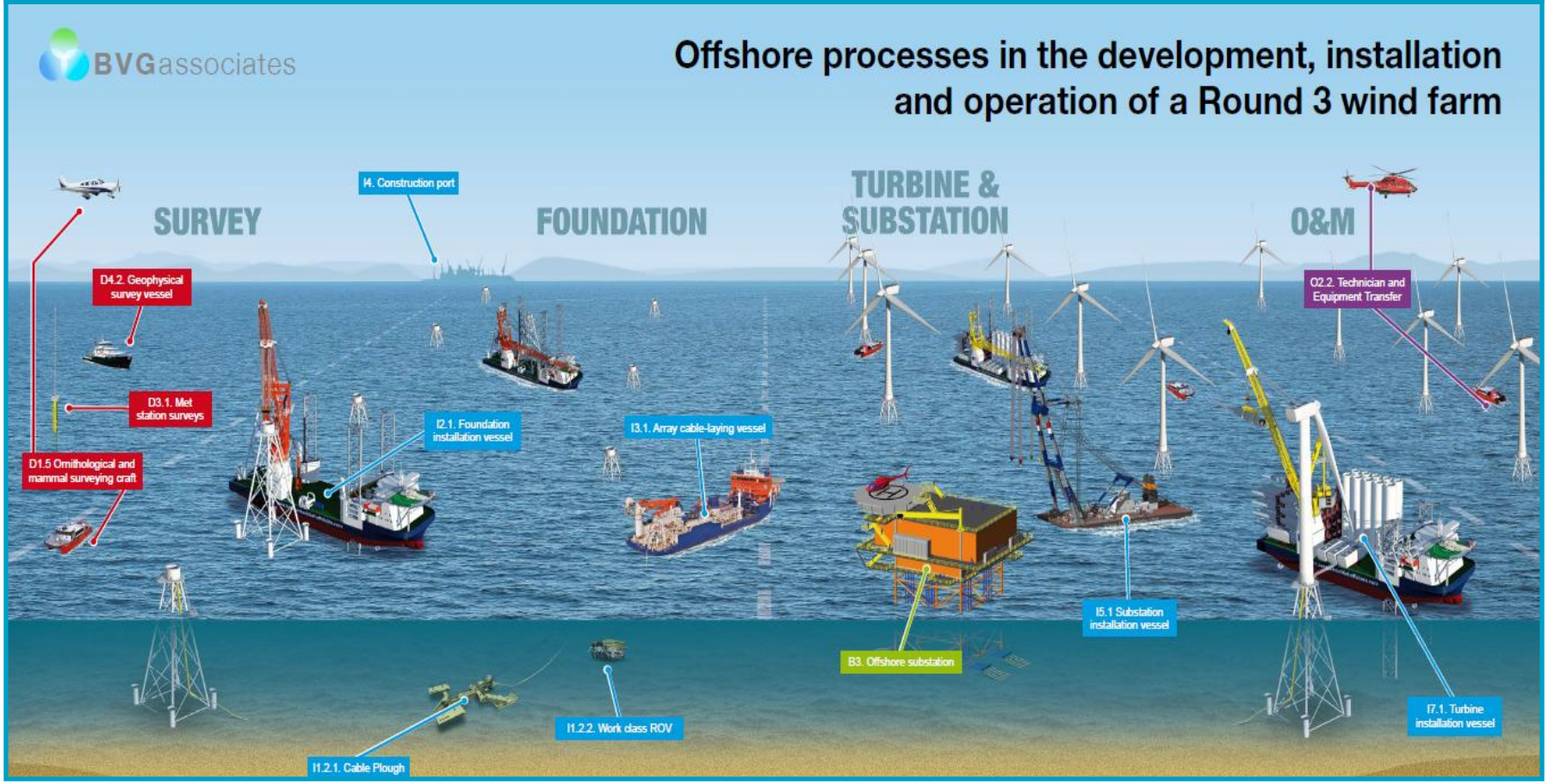




Supply opportunities

Opportunities throughout the project lifecycle

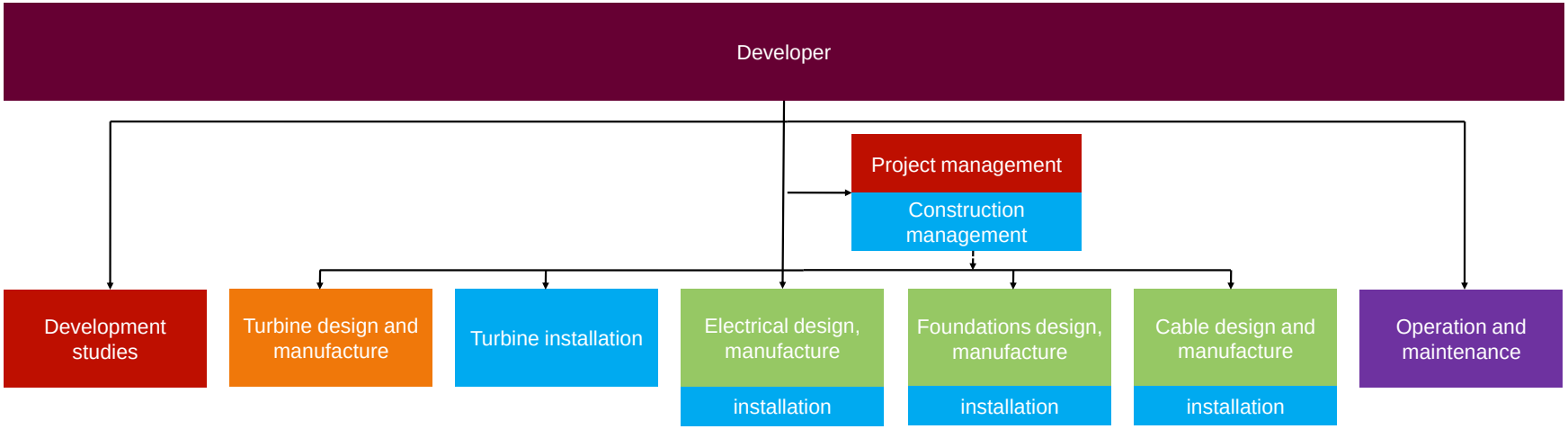
25-30 year lifespan from cradle to grave, and rising



Market structure

Know your customers

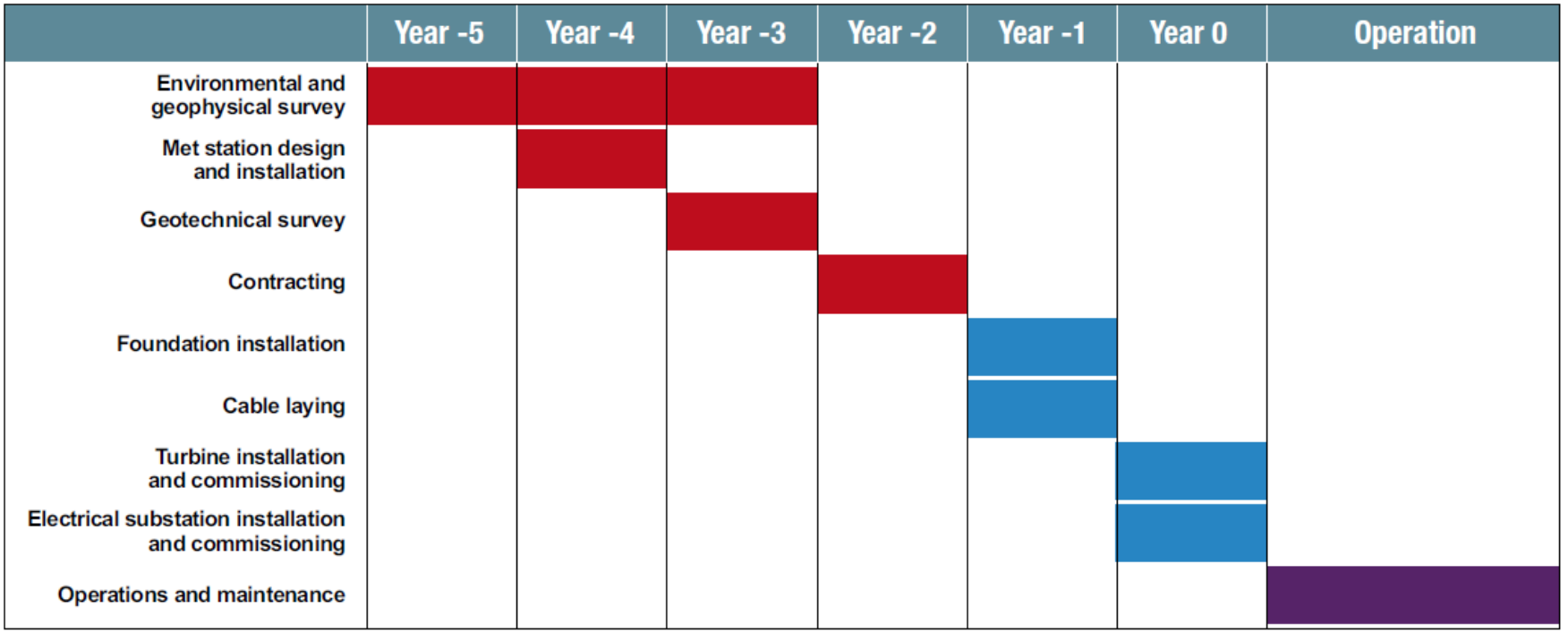
Multi-contract most common, currently



Typical project

Project timescales

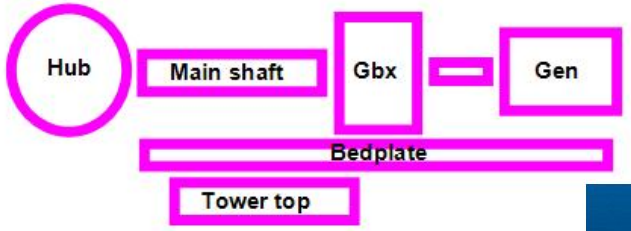
5+ years to develop; 20-25 years operation

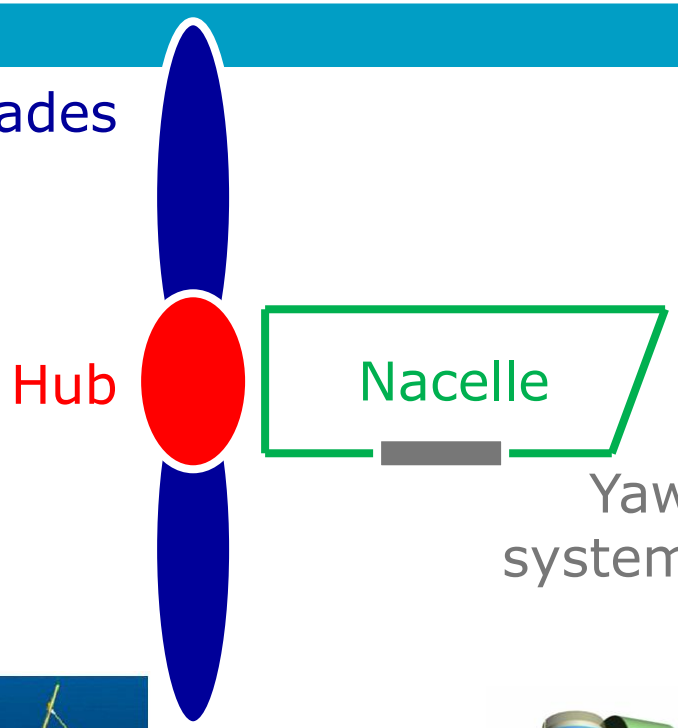


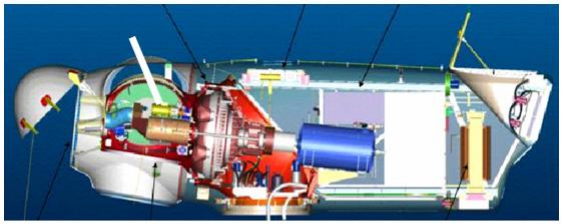
What is needed?

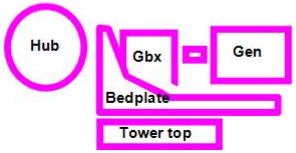
Turbines

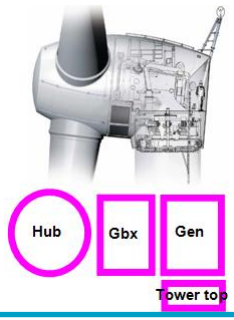
Evolution from onshore wind technology – not harmonised yet

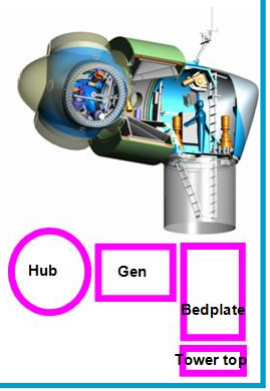












What is needed?

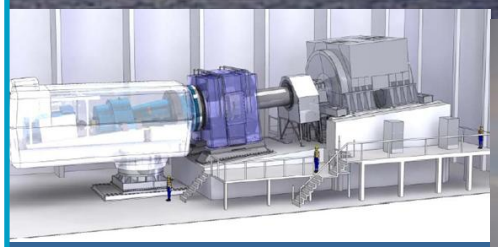
Foundations

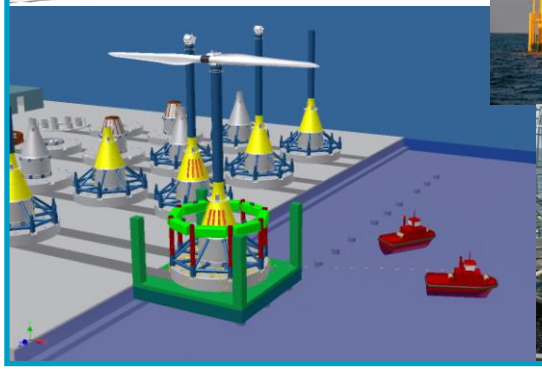
Diverse solutions – more than just a support

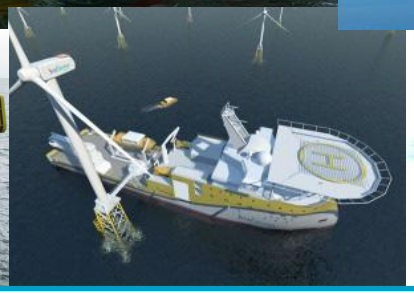
What is needed?

Testing, installation, substations, cables, O&M...

Culture is important: Can-do and cost-down







R&D Funding opportunities

Technology Strategy Board

Feasibility Studies

- Up to £3m of funding to explore new innovative technologies for offshore wind
- Grants of up to £100k and 1 year duration
- Bringing new ideas to the offshore wind sector
- Across any part of the system
- Ideas to come from inside and outside the sector
  - Assembly methods / technologies from the manufacturing industry
  - CFD from automotive
  - Composites and coatings from materials
  - Reliability and asset management from defence...

Competition open
5 November 2012 to
16 January 2013
Briefing 13 November

Knowledge Transfer Partnerships

- Up to £1.2m to accelerate innovation from academia to industry
- KTP funds hiring a graduate for a project and provides 0.5 day/week of academic support to it.
- For example:
  - Novel electronics
  - Control
  - Environmental tools development

Competition open
13 September 2012 to
24 April 2013
Briefing 13 November

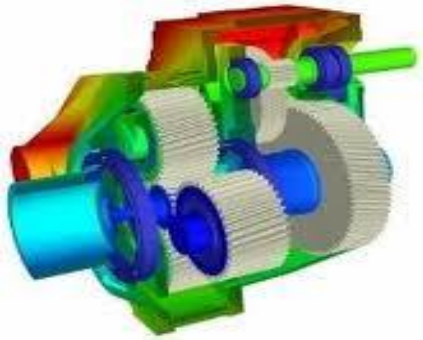
R&D funding opportunities

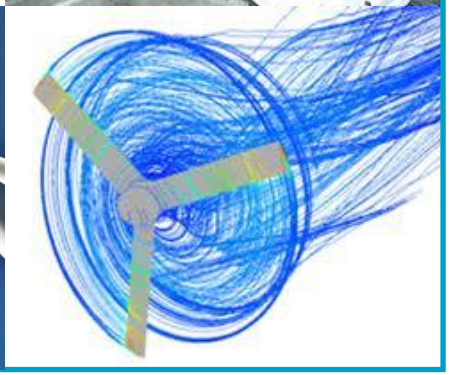
Department of Energy and Climate Change

Component Technologies Development and Demonstration

- £30m+ support provided so far
- Up to £7m of funding to develop new component technologies across the system.
- 3rd Round of calls this year from DECC
- Grants of up to £4m
- Last planned call

Competition open to
16 January 2013
Briefing 13 November

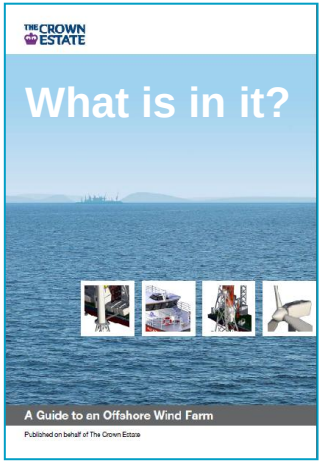


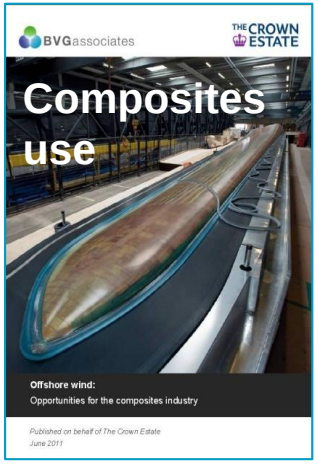


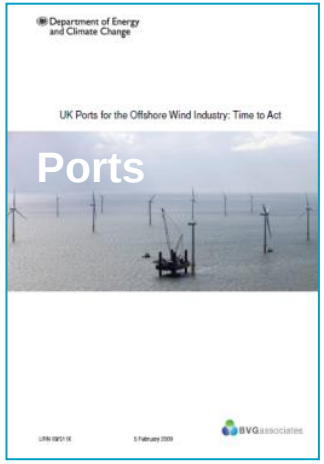
Thank you

Here to help

Come and talk







Bruce Valpy

info@bvgassociates.co.uk
Tel: +44 1793 752308
www.bvgassociates.co.uk

The Blackthorn Centre,
Purton Road,
Swindon SN6 6HY

1 Old Station House,
Burntisland,
Fife KY3 9DJ