Bigger, Larger, Heavier

New offshore wind projects in the pipeline and consequential demands for the supply chain

Dr Alun Roberts, Associate Director

Offshore Renewables – Wind, 6 December 2016

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- Analysis and forecasting
- Strategic advice
- Business and supply chain development

Economics

- Socioeconomics and local benefits
- Technology and project economic modelling
- Policy and local content assessment

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- Engineering services
- Due diligence
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Selected clients


IRENA
INNOVATION OUTLOOK
OFFSHORE WIND
Future renewable energy costs: offshore wind
51 technology innovations that will have greater impact on reducing the cost of electricity from European offshore wind farms
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Renewable Energies
Update 2016

My brief today

What the programme says

- Assessing permits and licences for future offshore wind farms
- Assessing life cycles of current offshore wind farms
- New demands for vessels to cater for next level wind projects and resulting potential contractor work

… which sounds rather dull

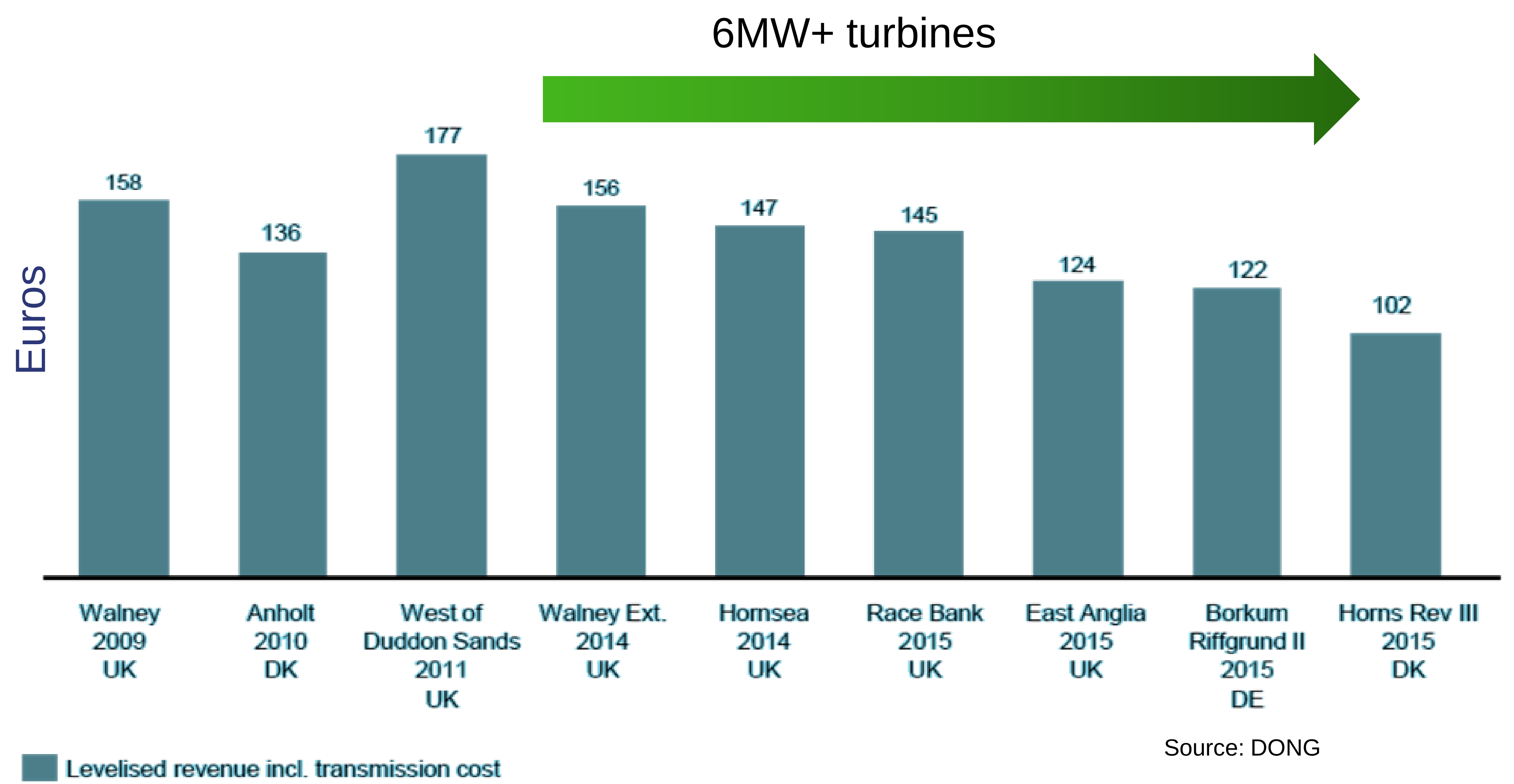
My brief today

I will talk about this instead

- What has happened to LCOE and bid prices (hopefully the same thing)?
- What does this mean for the projects that get built?
- What does it mean for future UK licensing activities?
- What will tomorrow's turbines look like (or weigh)?
- What does all this mean for the supply chain?

Offshore wind is no longer expensive

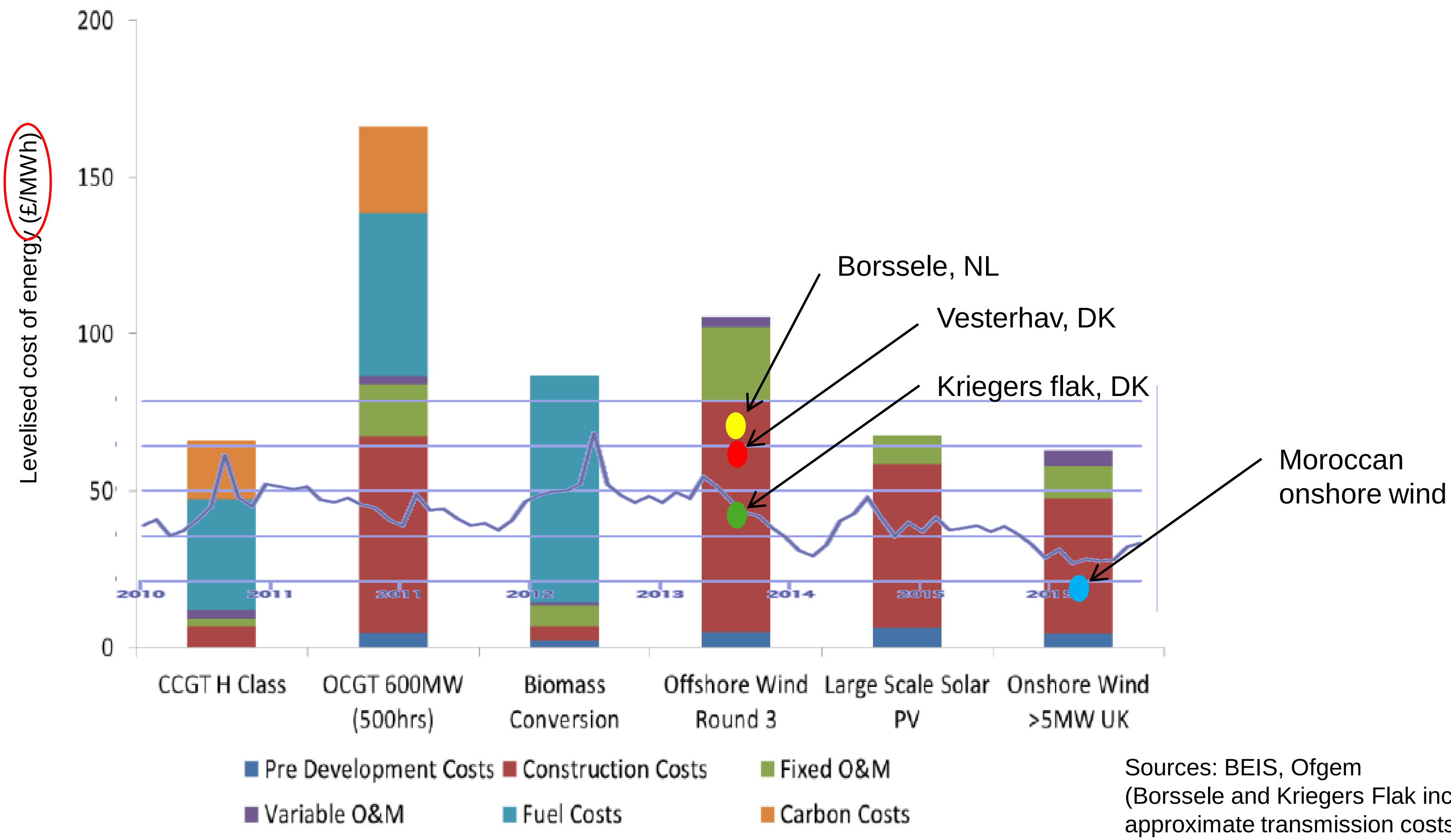
Electricity generation costs for projects commissioned in 2020



Source: DONG

Cost reduction is king

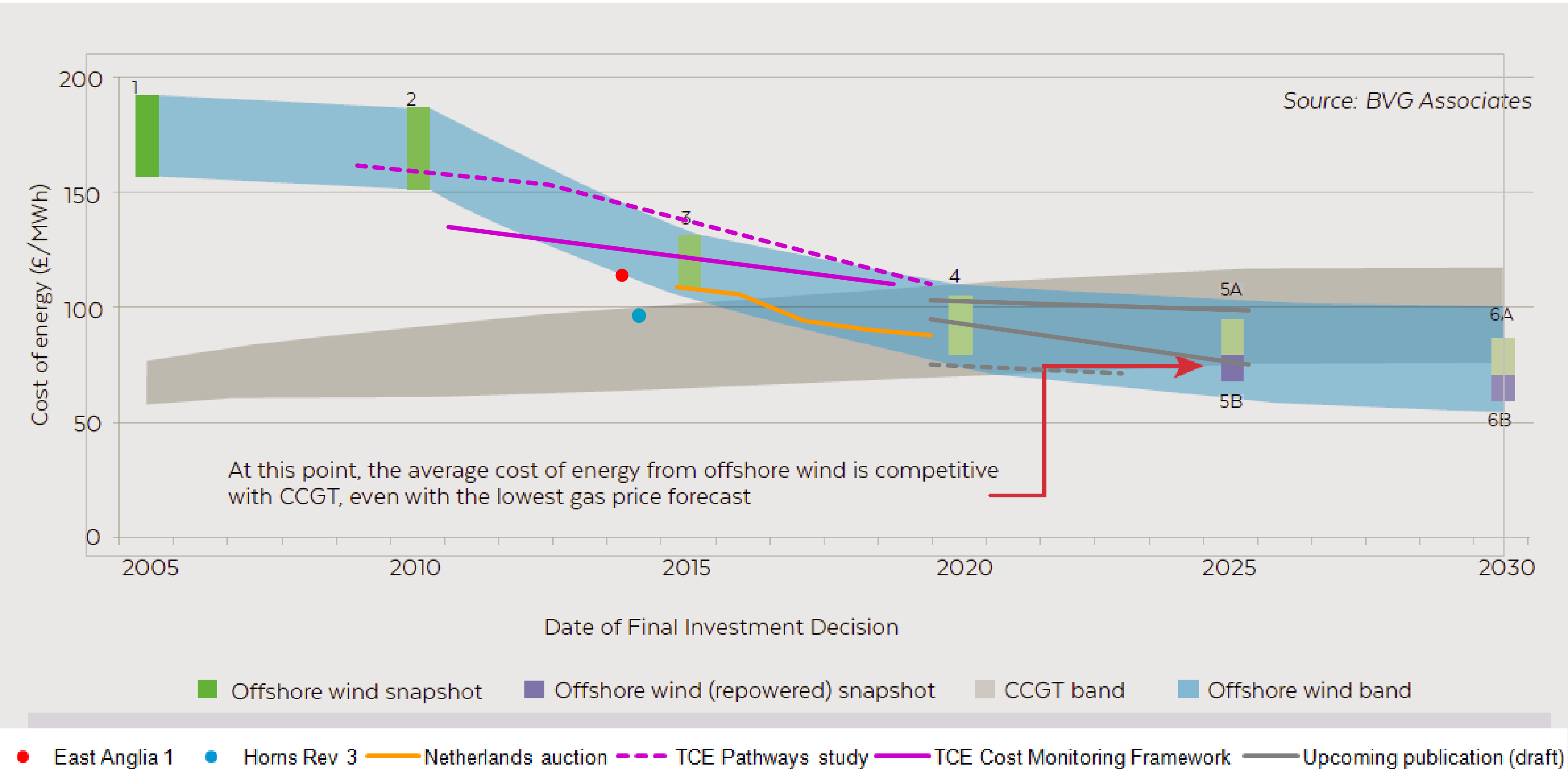
Many said it couldn't be done



Sources: BEIS, Ofgem
(Borssele and Kriegers Flak include approximate transmission costs)

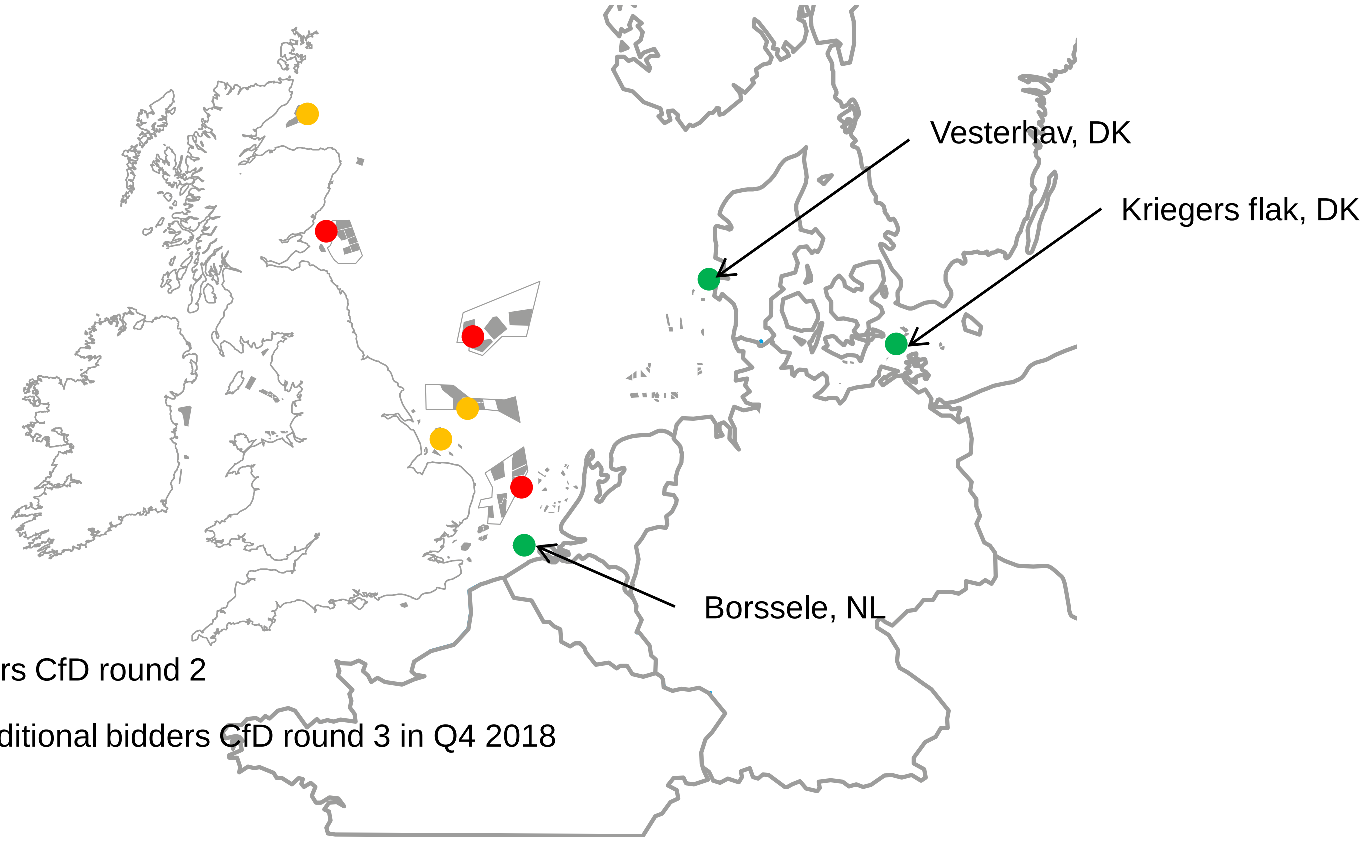
Looking ahead

Subsidy-free by 2023



What does this mean for the projects that are built?

Key projects



- Likely bidders CfD round 2
- Possible additional bidders CfD round 3 in Q4 2018

The UK pipeline

The wrong projects?

- For CfD round 2, winning bids about £85/MWh?
- UK wasted all its low-cost sites on industry building?
- Big zones just vanity projects? Has Round 3 been a failure?
- Has the UK consumer/tax-payer made the investment that others benefit from? (we haven't got much of the supply chain either)
- Perhaps unfair – but we are probably not where we wanted to be
- UK definitely needs to supplement these big zonal developments with smaller projects in attractive locations
- The Crown Estate has talked about Round 3.1 but it needs to be careful that the big zone developers maintain their commitment

Thinking big

How do we get the benefit of big zones

- Increased pipeline of projects with similar technology needs can create certainty for supply chain, stimulating investments
  - Vessels?
  - Turbine variants?
- Learning is consolidated in project teams
- Optimised operations and maintenance
- How do we design CfD rounds 3 onwards? Is 1.2-14GW each time enough? Would you build Creyke Beck A separately from B?
- Do the CfD rounds need to be rethought? Currently you need a consented project to play - £80 million is an expensive ticket. How many developers would start on this process now?
- The current CfD allocation process doesn't look sustainable.

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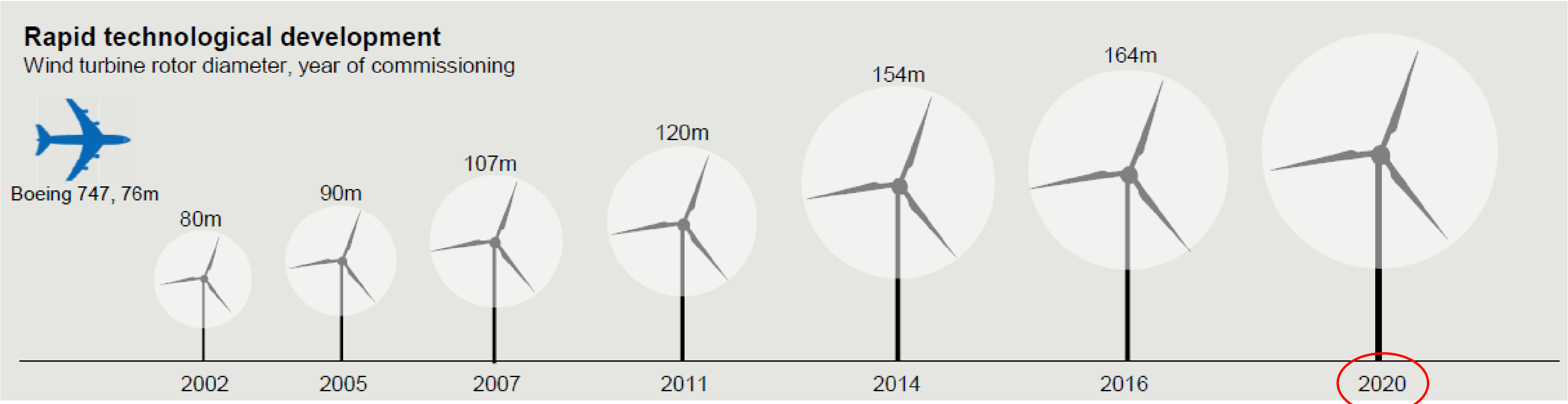
What does this mean for the supply chain?

How do we get to subsidy free?

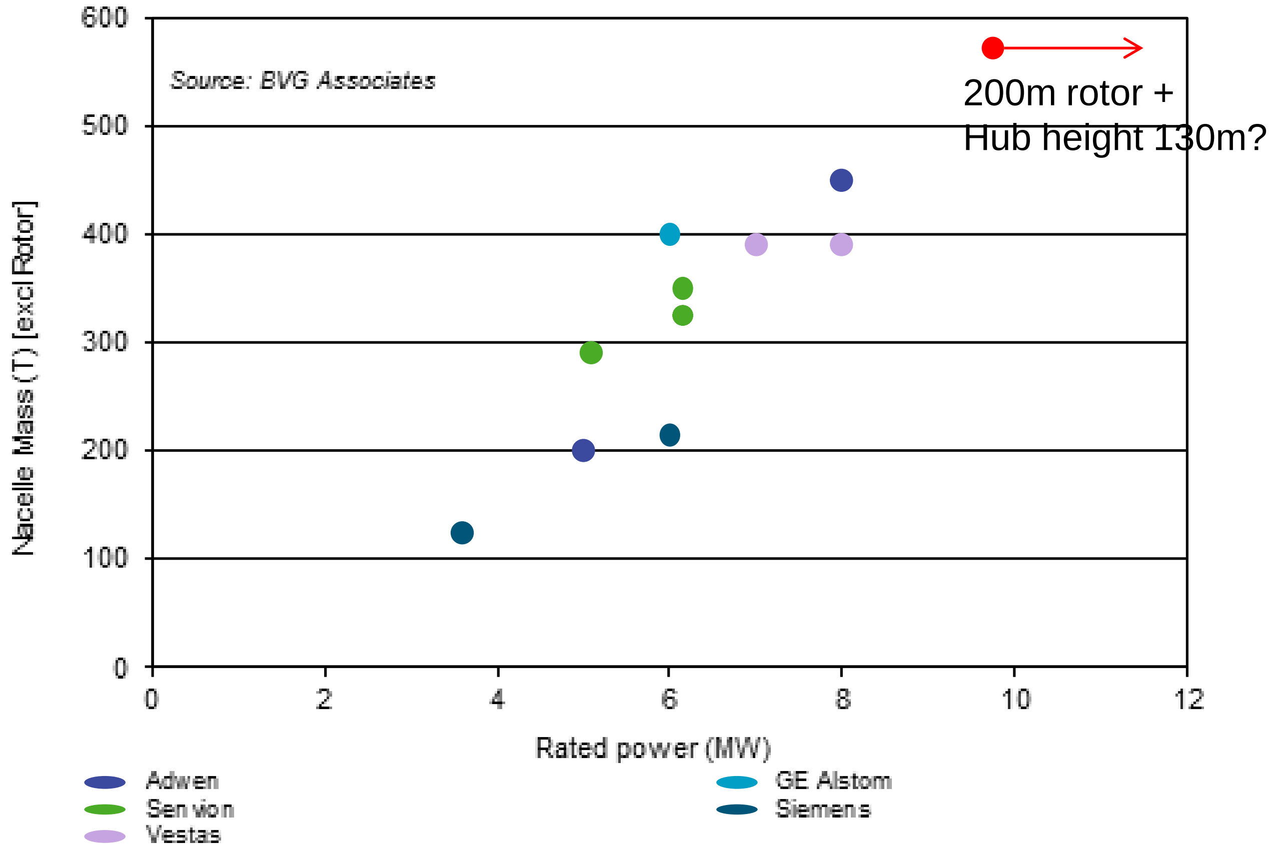
- A word of caution. Just because we have had rapid cost reduction, doesn't mean that it will continue at the same pace. And bid price isn't the same as LCOE …
- Happy coincidence of new turbines, cheap steel and cheap finance. Can't assume that the last two will remain favourable.
- It becomes more important that turbine development (and other innovation) continues.



Source: DONG

What does this mean for the supply chain?

What will a 12MW turbine look like?



What does this mean for vessels?

Collaboration is vital

- Too many were surprised by the rapid introduction of 8MW turbines
- A lot of investment in turbine installation vessels but the fleet no longer looks fit for purpose
- Upgrades to vessels (legs and cranes) can plug the gap in the short term
- Are there any vessels that can install a 10MW+
- When vessel investments were committed in 2010-12, the forecast market was a lot larger
- Is there a business case for a new vessel?
- A manufacturer cannot develop a new turbine if the LCOE benefit is lost through inefficient installation
- If a WTM can make long-term commitment to SOVs…

Seajacks Scylla

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What does this mean for vessels?

Do we need a radical re-think?

- Is it asking too much to keep bringing new vessels into service to keep up with turbine developments?
- Integrated turbine installation has been explored but barriers to entry were too high
- Is this still true? Could it be the USA's solution to the Jones Act problem?
- Will the floating industry tackle concerns about onshore logistics?
- Will turbine manufacturers need to engage with radical solutions to sustain cost reduction?

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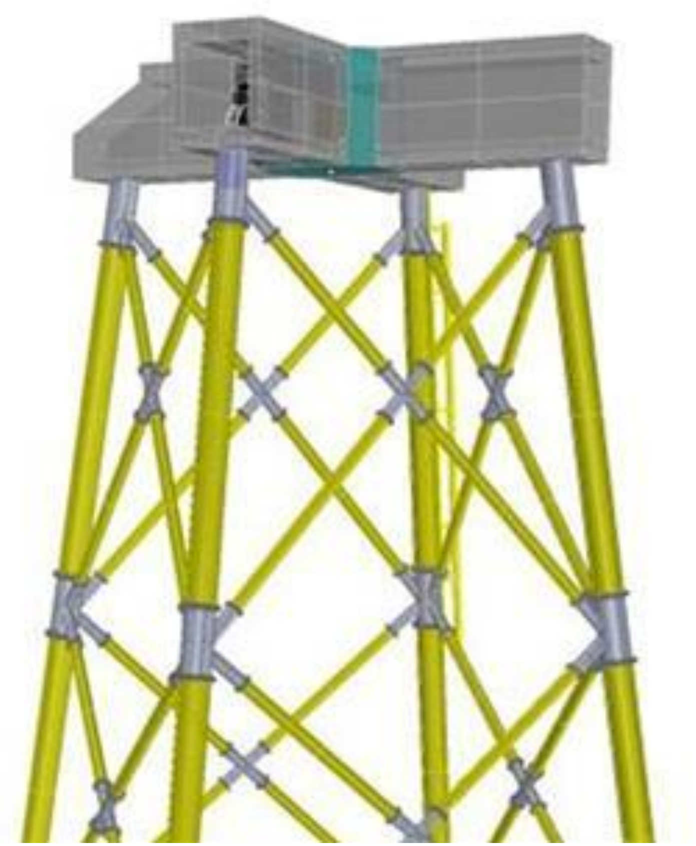
What does this mean for foundations?

The demise of monopiles was greatly exaggerated

- Back in 2012, many thought that you couldn't manage more than a 6MW at 25m on a monopile
- Even for larger turbines, could monopiles still be used for near-shore sites with 10-12MW turbines (assuming there are no consenting problem?
- Investment in jacket facilities has lagged because of technology/market uncertainties and because fabricators need to amortise over a short period.
- No point if turbine innovation LCOE gains are lost on suboptimal foundations
- Again, there is a strong case for turbine manufacturers to collaborate with the supply chain



Source: Siemens

What does this mean for everyone

The turbine manufacturers are more important than ever in shaping the future of the industry

- Turbine manufacturers have made a huge contribution in making offshore wind the most attractive new source of renewable energy in some markets.
- They have shown a huge faith in the potential for cost reduction
- Much of the cost reduction has been from a declining market for foundations, cables and installation contractors
- New investments in the supply chain need the intervention of turbine manufacturers and they therefore become more influential and powerful in the industry
- This is good – because they have shown leadership
- This could be bad for suppliers if they are competing in a shrinking market
- Should we be concerned that competition in the turbine market is less fierce than we would like? Do we need a hungry third player in the UK market?

Thank you

BVG Associates Ltd
The Blackthorn Centre
Purton Road
Cricklade, Swindon
SN6 6HY UK
tel +44(0)1793 752 308

BVG Associates Ltd
The Boathouse
Silversands
Aberdour, Fife
KY3 0TZ UK
tel +44(0)1383 870 014

info@bvgassociates.co.uk
@bvgassociates
www.bvgassociates.co.uk