



The practicalities of securing investment
Financing Innovation
September 2015

 **OrbisEnergy**
offshore renewable business

OrbisEnergy – What are we?



- Innovation & incubation centre for offshore renewable energy
- Technology transfer / acceleration
- Business and sector development
- Links to higher education research
- Access to funding and grants
- Conference and exhibition centre
- **Hub for Offshore Renewables in the East of England**



What we do



TENANCY OPTIONS





INDUSTRY NETWORKING



CONFERRNCING



- ECOWindS – 3yr European funded collaborative R&D project between **South Denmark, East of England, North-West Germany and Norway.**
- **Focussing on cost reduction through improving the innovation capacity of the European offshore wind servicing sector.**
- Generating and validating innovation and research needs over the next 10-20 years.



European Clusters for Offshore Wind Servicing

www.ecowinds.eu

- Key project element is feedback from Industry, Research and Administration
- Stakeholder lead project, with input via workshops
- Successful Final Conference took place 29/09 here at OrbisEnergy
- 100+ delegates attended, with cross EU speakers

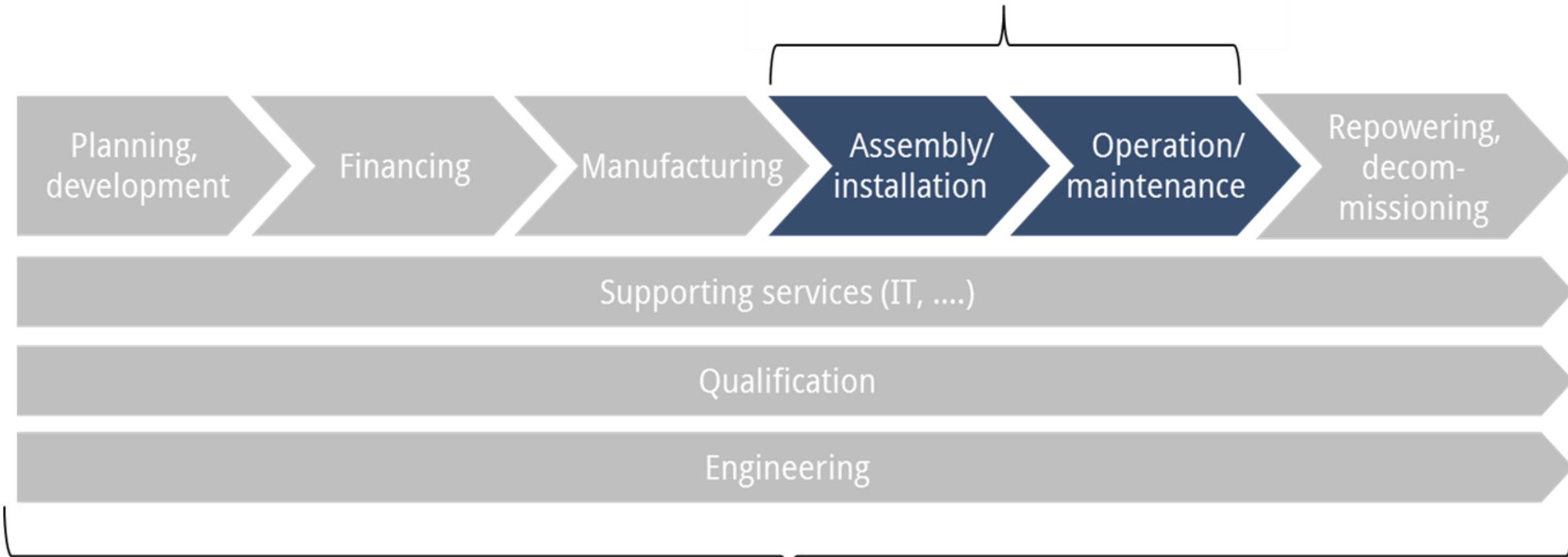


European Clusters for Offshore Wind Servicing

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Offshore Wind Servicing

Offshore wind servicing (OWS)



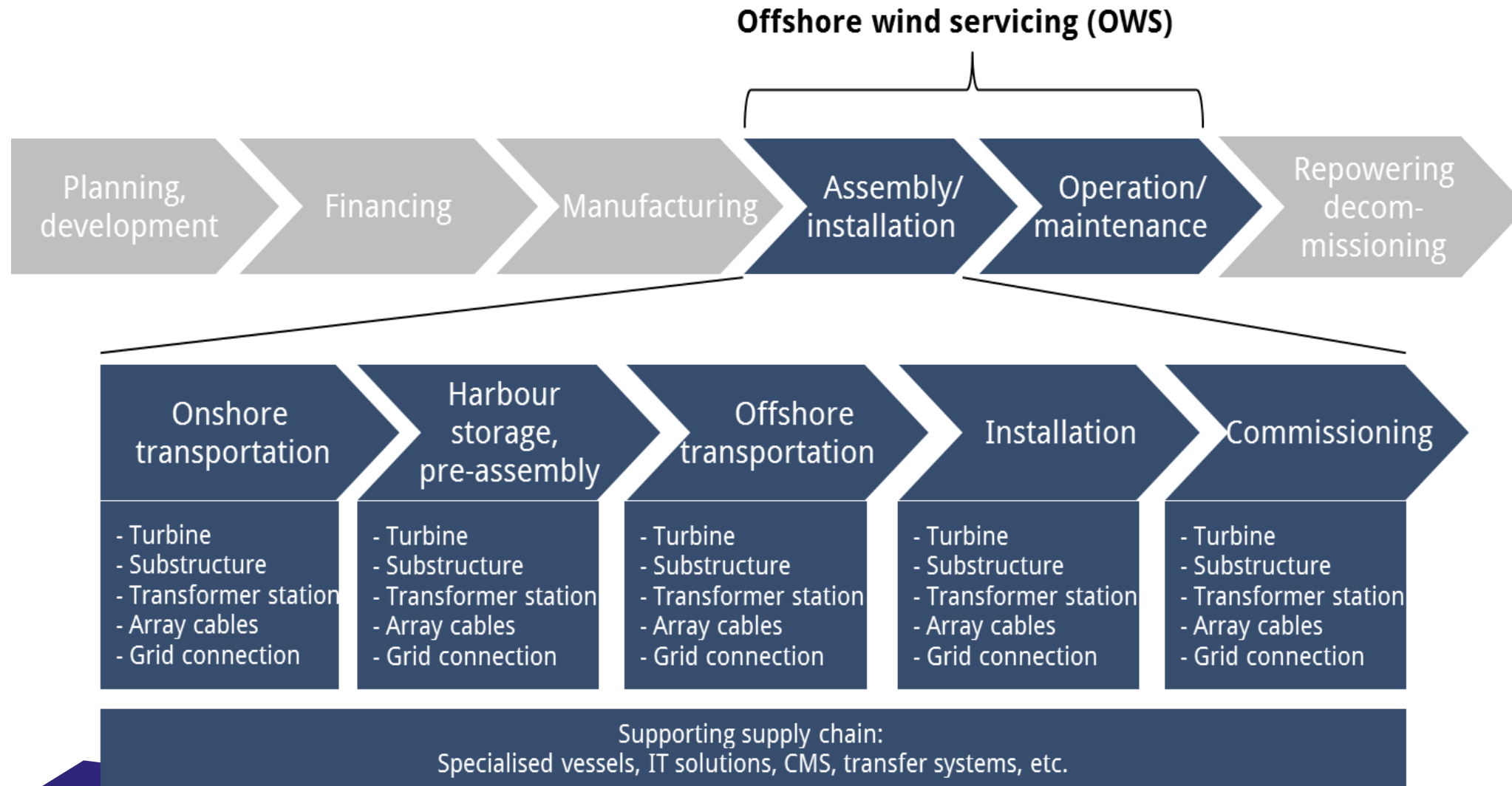
Value chain of offshore wind (OW)

Developing Research and Innovation Ideas

- Initial ideas and reviewed by a Technical Advisory Group of industry experts
- Catalogue developed based on feedback from TAG group.
- 150+ initial ideas distilled into 32 detailed concepts



OWS Value Chain Breakdown – A&I



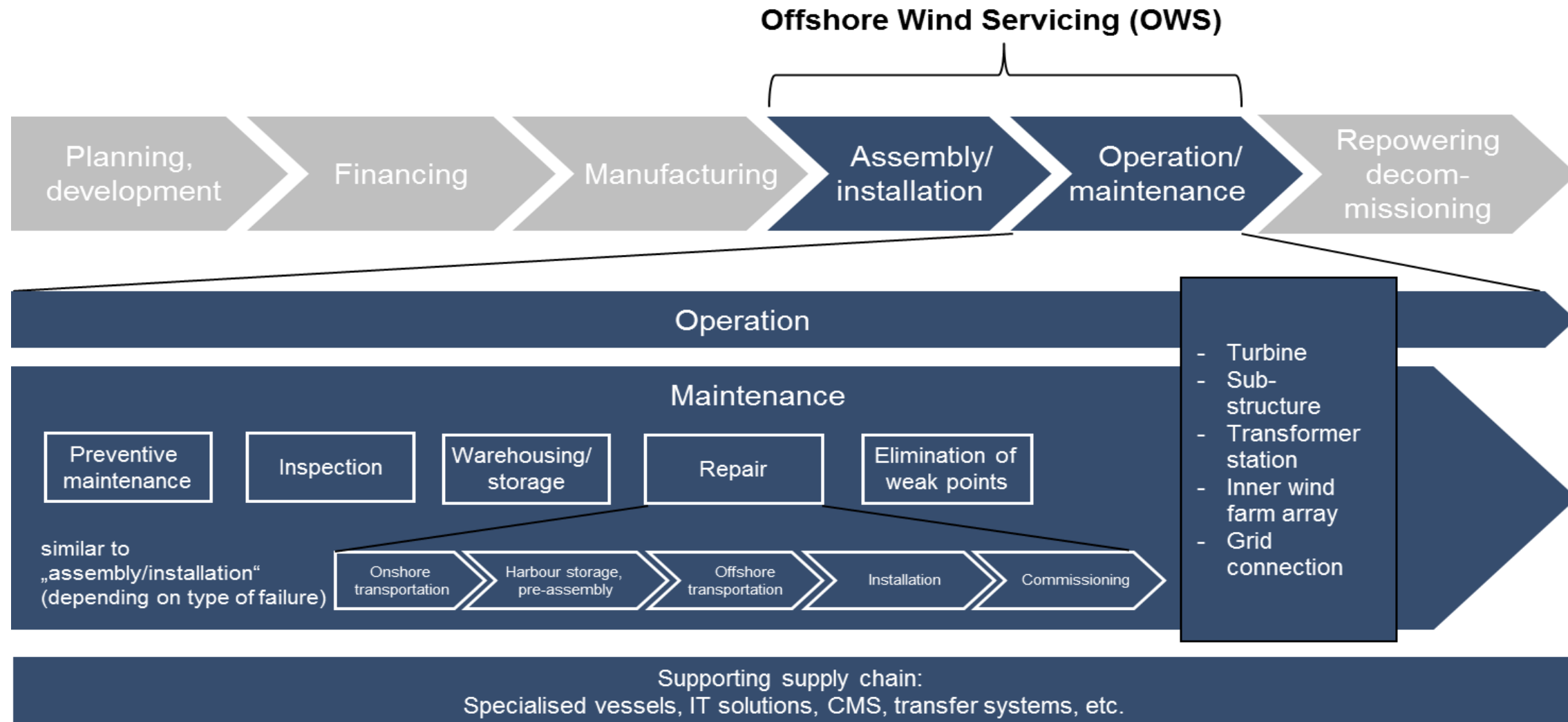
Example A&I Innovation Concepts:

- R&D into the best practices (methods) for the effective repair and/or replacement of turbine components
- This project will establish highly reliable best practices for the onsite repair of components where possible, and for their easy removal and replacement where necessary.
- To prolong the lifetime of turbines and their components, the possibility of repair or reuse of the turbine components should always be evaluated. These best practices should be incorporated into the design of O&M strategies for operators and OEMs, and methods to verify and evaluate the efficiency of new repair techniques should also be incorporated.

Example A&I Innovation Concepts:

- **RDI to improve cable installation and protection methods at a low cost**
- **The project will investigate methods/processes to reduce the costs associated with installation and damage prevention of offshore subsea cabling**
- This will include identifying measures to maximise the safe range of working conditions for installation and trenching activities, and the development/adoption of improved solution to cable protection/scour prevention

OWS Value Chain Breakdown – O&M



Example O&M Innovation Concepts:

- **R&I in the monitoring and analysis of weather data on site, with improved models for on site weather prediction to support OWF design, installation and O&M activities**
- **Project should include; Extracting additional value from existing metrological data sources. Acquiring environmental data such as wind speed, atmospheric temperature, wave height and turbidity, and Improvements in forecasting weather to result in improved operational efficiencies**
- Explore the feasibility of using innovative apparatus, e.g. measurement of surface wind from swilling elements (buoys) to substitute met masts/apparatus for localised gust monitoring using low cost LIDAR technologies

Example O&M Innovation Concepts:

- **Develop simulation apparatus and programmes to provide standardised, real-time training for key offshore wind operations**
- This project would begin with reference to simulation models developed through the ECOWindS project, and continues to develop and disseminate the simulator provision in line with industry needs

Example O&M Innovation Concepts:

- **Development of technology testing facilities relevant to OWS, and critical to encourage and facilitate innovation**
- This project will map existing facilities/capabilities for the testing of new technologies and processes in offshore wind servicing across Europe and identify gaps in the provision or where demand for facilities is not met. The feasibility, location and cost of one or more European testing centres will then be explored.

A photograph of an offshore wind farm at sunset. The sun is low on the horizon, creating a bright orange and yellow glow that reflects on the water. Several wind turbines are visible, silhouetted against the sky. The sky is a mix of blue and orange. In the foreground, a dark metal railing is visible, suggesting the viewer is on a platform or boat.

Financing Innovation

“Funds to support the creation and development of ideas, systems, and technologies.”



There is no shortage of expertise, support and finance...

.... it's in the small print!

Sources of Innovation Finance

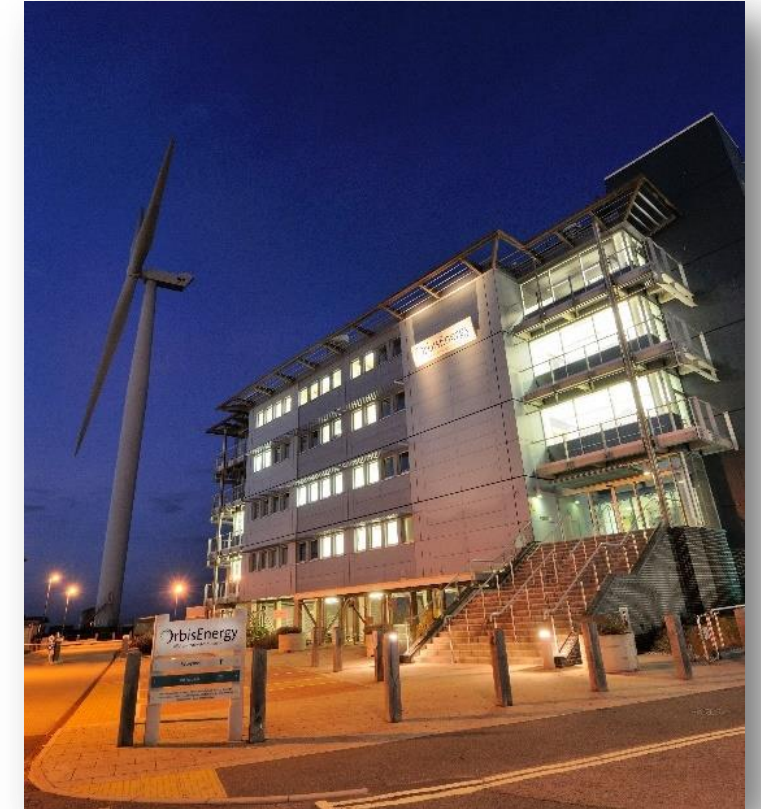
- Government Bodies (*Innovate UK, DECC, BIS*)
- Local Enterprise Partnerships
- Universities
- R&D Tax Credits
- Crowd Funding
- Angel Investor Networks
- Venture Capital Partners
- Private Equity Firms
- GROW: Offshore Wind
- ORE Catapult
- OrbisEnergy

.... and many more

Case Study: SCORE Grant Investment

- **£2.5m Supply Chain Innovation Grant investment programme, supported by EU funds**
- £50k or 30% of project costs
- Progress to date:
 - 44 projects approved
 - £2.6m being invested in innovative projects
 - 70 new jobs created

£46m successor project currently under development



Find the facts first...



Are you eligible?

What's the maximum 'intervention rate'?

Do you need to provide 'match funds'?

What's the application process / timescales?

Claim process... upfront payment / claim in arrears?

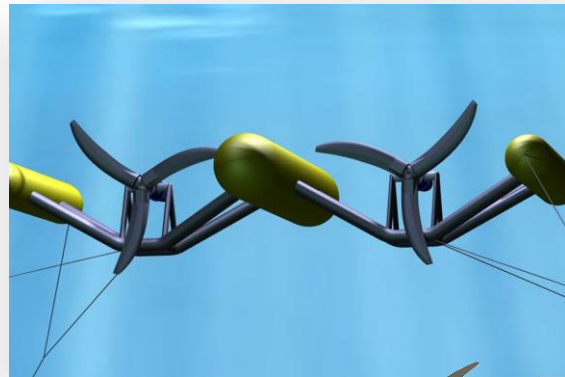
Grant / Loan / Equity / Convertible options?

What are the risks? Audits/clawback?

Angels & VC Investors... when is the right time?

Low Carbon Innovation Fund

- **Low carbon venture capital fund**
- Equity or convertible loan between £25k and £750k.
- Operated by Adapt, part of the University of East Anglia.
- Already investing in the offshore renewables sector!



adapt⁺ part of the Adapt Low Carbon Group



A large-scale photograph of an offshore wind farm at sunset. The sky is a mix of deep blue, purple, and orange, with scattered clouds. The sun is low on the horizon, creating a bright orange glow and a shimmering reflection on the dark water. Numerous wind turbines are visible as silhouettes against the bright sky, with one particularly large turbine in the foreground on the left.

Developing winning bids...

London Array

Get some perspective

Just because you think it's a good idea... do your potential customers? Where's the demand?

What's the problem your solution is trying to solve?

Is there an existing market for your innovation?

What is / How long is your route to market?

Blades

Drive trains

Electrical infrastructure

Wind & ocean conditions

Foundations & substructures

Operations and maintenance

Installation & decommissioning

Challenge led innovation

- ORE Catapult: 7x Knowledge Areas
- New 'Innovation Challenges'
- Developed based on detailed feedback from Industry and Research Advisory Groups
- **Potential market?!**

Innovation Challenges

Knowledge Area	Innovation Challenge Area (examples)
Blades	Blade erosion, health monitoring, improved manufacturing process & quality.
Drive Trains	Condition monitoring, hydraulic to electrical power take off
Wind & Ocean Conditions	Utilise existing met ocean data, remote sensing (e.g. LIDAR), environmental sensors
Electrical Infrastructure	Cable protection, dynamic cables
Foundations & substructures	Structural health monitoring, pin piling
Installation & decommissioning	Mooring systems, connection/disconnection devices
Operation & Maintenance	Access systems, asset management

<https://ore.catapult.org.uk/innovation-challenges>

Get tested!!

- The UK has some of the world's best test and demonstration facilities
 - ORE Catapult (Blyth)
 - WaveHub / FaBTest
 - European Marine Energy Centre
 - Universities and Research Labs
 - Operational projects
- Prove it works before going to market!
- Independent validation and endorsement

Blade Test 1 (50m)

Blade Test 2 (100m)

Nautilus (3MW)

Fujin (15 MW)

Charles Parsons Laboratories

NOAH offshore platform

Docks / artificial seabed

Onshore tower

It's all about the plan...

- Have a clear business, investment or project plan.
- Be honest about the real opportunity (with yourselves too).
- Find the right funding partner that meets **YOUR** needs!
- Get external support to test and refine your plan... remember, funders/investors know their game. Make sure it works for you!
- The days of 100% upfront grants are gone. Think carefully about the cash flow!

SUMMARY

- There is no shortage of expertise and finance to help
- Make sure the funding/finance works for you
- Don't compromise your core business objectives
- Get external support to help refine your plan
- Be realistic about how much you need and when
- Make sure you can cashflow your innovation!

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