Driving innovation in sub-sea inspection for offshore wind
New challenges and old solutions

Michael Stephenson | Carbon Trust
GCE Subsea Offshore Wind Seminar

31/05/2018
Agenda

1. The Offshore Wind Accelerator

2. Underwater Inspection Competition

3. Wrap-up
# Carbon Trust Offshore Wind

## Advice and insights

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## Programmes

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The Carbon Trust’s Offshore Wind Accelerator (OWA)

Industry-led programme centred on the cost reduction and de-risking of offshore wind.

Partnering developers are involved in over ¾ of all operating offshore wind farms in Europe.

Programme promotes the engagement of industry designers, innovators, consultants and specialists.
The Carbon Trust’s Offshore Wind Accelerator (OWA)

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Since 2009

Driving international, cross industry engagement and development

> £100m

Cumulative investment in R&D projects

60%

Funded by the participating industry developers

> 100

R&D projects developed
The Carbon Trust’s Offshore Wind Accelerator (OWA)

The programme has 5 research areas. Projects in each area range from technical studies to technology testing, demonstrations or support. New projects are developed and tendered every year according to the interests or needs from the programme partners.

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Overview of Underwater Inspection Methods project

Why?
Developers are interested in new methods for carrying out underwater inspections to improve data quality and ultimately reduce costs and improve HSE

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Challenge 1: Monopile weld inspection

Winner: Oceaneering

Oceaneering

- Crawler based inspection technique – magnetic attachment
- Use of ‘phased-array’ ultrasonic sensors
- Can be deployed internally
- Tracks circumferential weld

Image courtesy of Oceaneering
Challenge 2: Jacket weld inspection

Winners: (1) Oceaneering and (2) Kraken Robotik

**Oceaneering**
- Tool equipped with alternating current field measurement sensors
- Attaches directly to jacket leg and can inspect weld

![Image courtesy of Oceaneering](image_url)

**Kraken Robotik - Seavision**
- Laser image scanning
- Increased accuracy visual inspection
- Flexible mounting – ROV proposed
- On board real time processing

![Images courtesy of Kraken Robotik](image_url)
Challenge 3: Monopile grout inspection

Winners: (1) Uniper Technologies and (2) Next Geosolutions

Uniper Technologies

- Low frequency ultrasound at wavelength of grout thickness.
- Produces spectra from reflections that can be interpreted to understand gaps in grout.
- Technology developed with British Geological Survey.
- More mature than other entrants – lab and offshore trials already undertaken.
- Further commercialisation support.
Challenge 4: Jacket grout inspection

Winner: Next Geosolutions

Next Geosolutions (in partnership with Hydrason and Ashtead Technology)

- Use of innovative wideband sonar to tackle jacket grout inspection.
- ‘Bio-sonar’ inspired by bottlenose dolphins.
- Consortium has operational, logistical and technological bases covered.
- Previously used in other industries but not yet applied to offshore wind.
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Summary

• Another case study of market-pull innovation.
• Innovators now have direct access to nine leading global offshore wind developers.
• Still a lot of interest despite no cash award – a lot of value in experience and support.
• Offshore trials planned for summer/autumn 2018.
• OWA continues to be interested in innovation in this sector.
Offshore Wind Accelerator

Opportunities

- **Consultancies and universities**– keep an eye out for our annual tenders for engineering studies, desktop work.
- **Supply chain** – let us know about potential demonstration projects, key capabilities so we can involve you in our projects.
- **Innovators and researchers** – have a great idea that will reduce the cost of offshore wind? Talk to us.

carbontrust.com/about-us/tenders/ or search ‘Carbon Trust tenders’

carbontrust.com/offshore-wind/ or search ‘Carbon Trust offshore wind’
Thank You

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