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Drift og vedlikehold - Spisset satsing i UK og Tyskland

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Industry meets Science, Trondheim 20. oktober 2015

Agenda

- Bedriftsnettverk Offshore Wind
  - Offshore Wind – Windcluster Norway
  - Globalt Europeisk marked offshore wind
  - Marked Tyskland & UK
  - Mulighetsområde

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§ 2 Formål

Windcluster Norway er en teknologi-, industri-, og leverandørklynge. Klyngens medlemmer samarbeider om gjensidig å styrke hverandres konkurransekraft for å oppnå leveranser av produkter og tjenester til produksjon av vindenergi, samt produksjon av vindenergi, til havs og på land i definerte markeder.

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Dette er Windcluster Mid-Norway:

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Team Humber
MARINE ALLIANCE

INNOVATION
NORWAY

TARGETING
INNOVATION

enterprise
europe
network
Business Support on Your Doorstep

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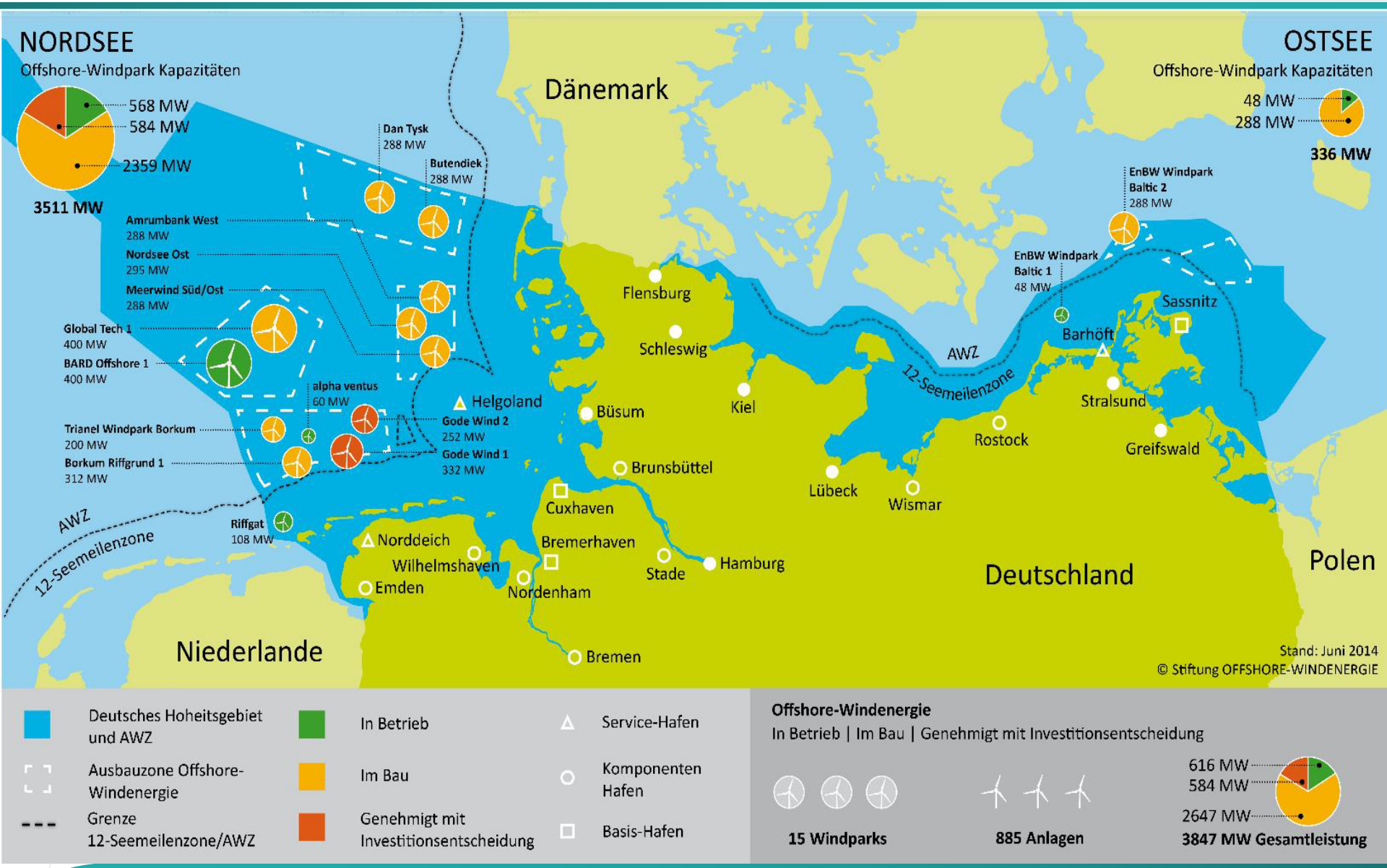

Kilde: German OFFSHORE WIND ENERGY Foundation

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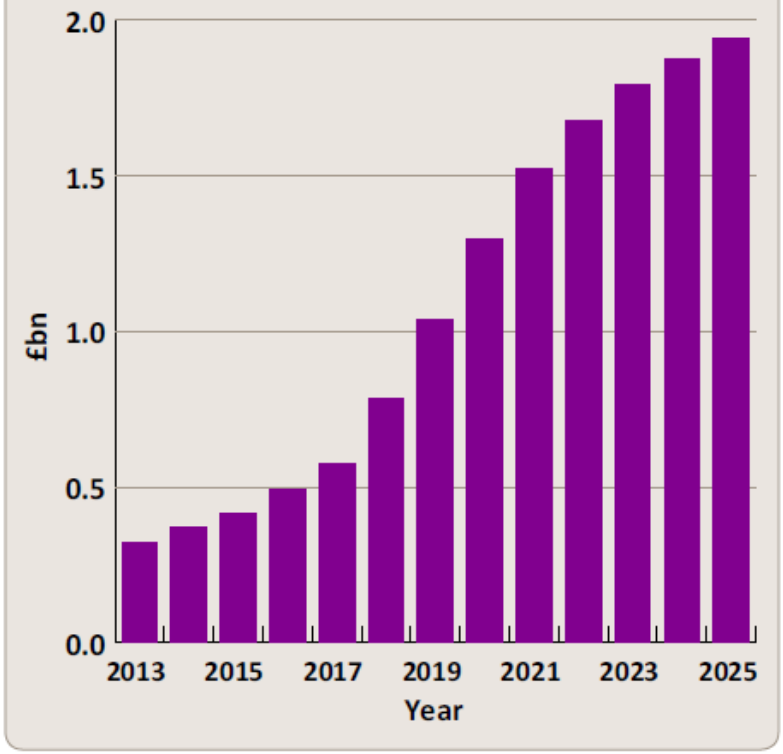
UK – O&M

The market for offshore wind O&M services is expected to grow to £1.2 billion/year by 2020 and almost £2 billion in 2025 – in the UK alone. This represents a five-fold increase on today's level. By the end of the decade there will be up to 4,000 wind turbines and 50 offshore substations requiring O&M in the UK.

The required O&M services are contracted by three main actors: project owners, wind turbine original equipment manufacturers (OEMs) and offshore transmission owners (OFTOs). These players are driving a wide range of contractual and strategic approaches to offshore wind O&M, underlining the need for commercial flexibility for contractors targeting this evolving and relatively fragmented market.

Figure 1.1: UK offshore wind O&M spend



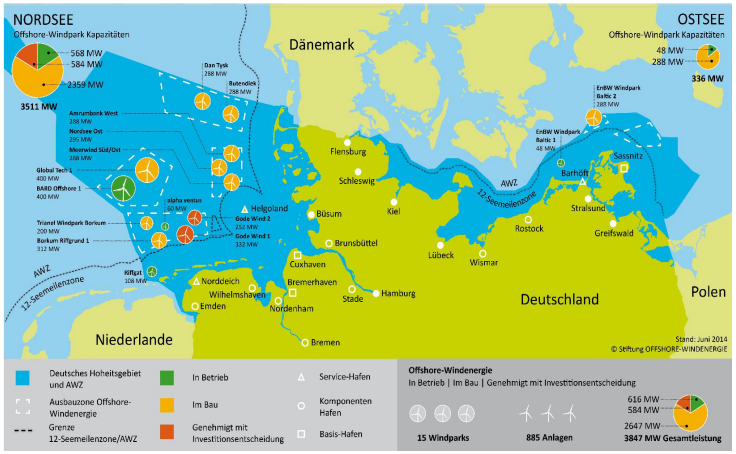
Kilde: Crown Estate

Business Development in German Offshore Wind

- 46% of the planned capacity of 6.5 GW are operational (15 Parks with a total of 3 GW: Alpha Ventus, Amrumbank West, Bard Offshore 1, Borkum Riffgat, Borkum Riffgrund 1, DanTysk, EMS Dollart, Global Tech 1, Meerwind Ost, Meerwind Süd, Nordsee Ost, Trianel Borkum, Baltic 1, Baltic 2)
- 23% are currently under construction (6 Parks with a total of 1.5 GW: Butendiek, Gode Wind I, Nordergründe, Nordsee One, Sandbank, Wikinger)
- Further 19 Parks are licensed (with a total of 6.7 GW)1
- The German government announced the possibility to extend the total capacity to 7.7 GW

- ***Every 3rd project planned until 2020 provides business opportunities in construction***

- ***All projects need operation & maintenance services once completed***



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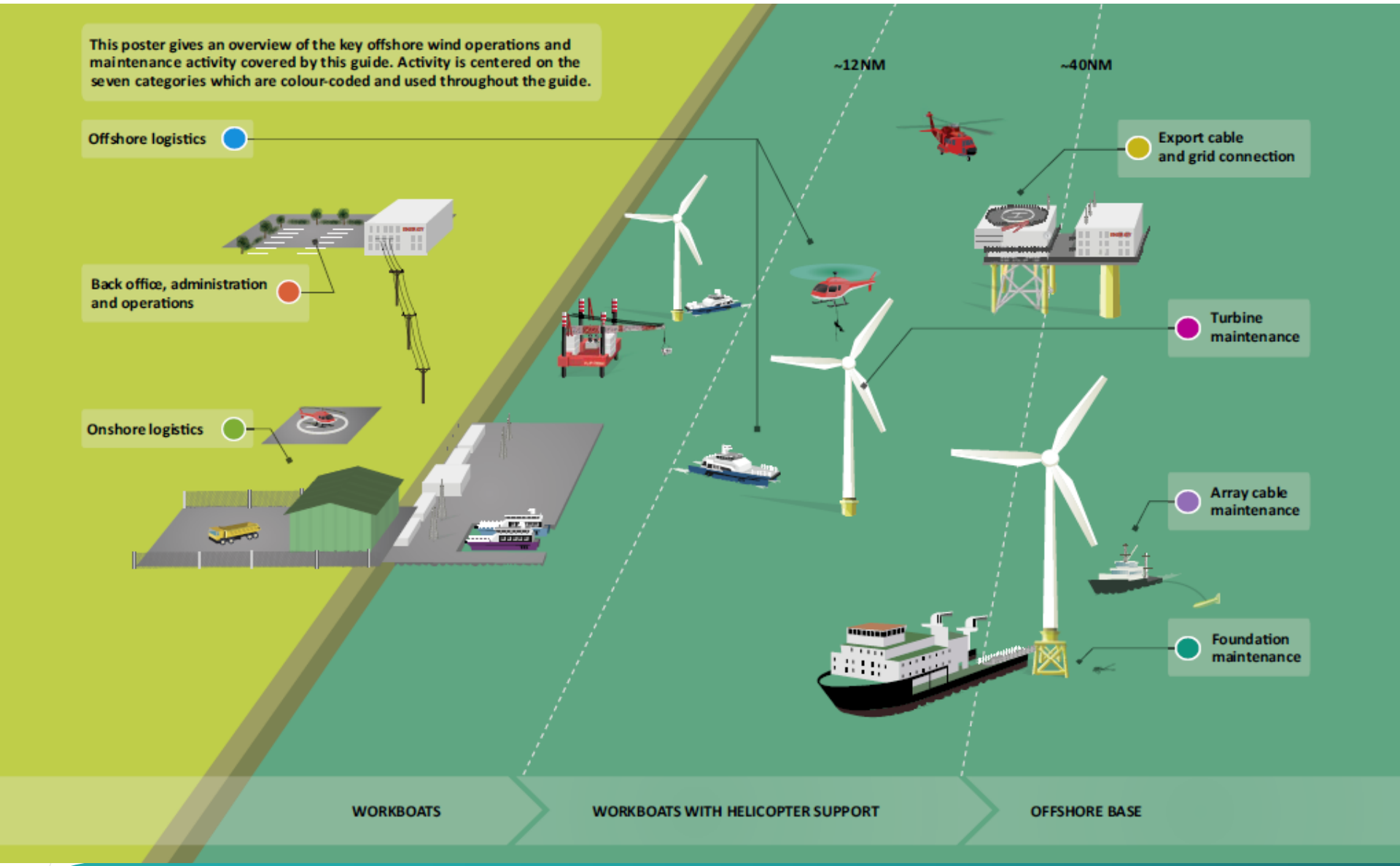

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Figure 4.1: Contract packages against key actors

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13. Foundation repairs

Maintenance of the structure of the turbine foundation and transition piece may involve various activities. Regular maintenance includes repairing the paintwork (especially on the boat landing) and cleaning marine growth.

More significant works can include repairs to grouted joints (unlikely to be needed in the future), rock placement to augment scour protection and intermittent repairs to wave-damaged secondary steelwork such as ladders, gates, grills and platforms.

Other systems installed on the foundation such as low-level navigation and sign illumination lights will also need to be maintained.

Example current providers: Various specialist contractors depending on scope

Indicative project spend: Very project dependent, indicatively £100,000 to £600,000/yr for 500MW wind farm (average spend)

Challenges and opportunities

- Specialist equipment and skills required infrequently – a large volume of operational wind farm capacity required to enable investment in dedicated equipment
- Ensuring sufficient redundancy of navigational lighting and ease of supply chain for replacement parts

14. Lifting, climbing & safety equipment inspections

Inspections of safety-critical devices including:

- Fall arrest systems
- Davit cranes
- Boat landing and ladders
- External gates and railings
- External evacuation equipment

Inspections must be carried out by qualified personnel, either as part of the primary turbine maintenance works or by a team of independent inspectors. Inspection frequency will be six-monthly or annual, depending on the equipment.

Drills/practices of health and safety incidences should feature as routine during O&M.

Example current providers: Certified maintenance technicians, Specialist inspectors

Indicative project spend: £100,000 to £200,000/yr for 500MW wind farm

Challenges and opportunities

- It is likely that most owners will seek to train up a number of their own technicians for these roles as they are frequent but require minimal time
- Potential scope for independent certifiers to provide these services, but unlikely to be a full-time role unless spread across multiple projects
- Owners will seek to perform inspections in the summer months to minimise likelihood of weather delays

15. SCADA and condition monitoring

Operating a wind farm depends on supervisory control and data acquisition (SCADA) monitoring, which is used to optimise wind farm performance and, potentially, identify component faults. In addition to the 24/7 monitoring and occasional remote manual intervention, which requires several dedicated personnel per wind farm, data can also be analysed in depth off site for condition monitoring purposes.

Example current providers:

- Operations and monitoring activity generally performed by the turbine supplier or the wind farm owner
- Condition monitoring analysis can be carried out by specialist third parties or consultancies

Indicative project spend: £400,000 to £800,000/yr for 500MW wind farm

Challenges and opportunities

- Improving plant condition monitoring equipment and algorithms to interpret early onset of component failures
- Increasing offshore wind data set

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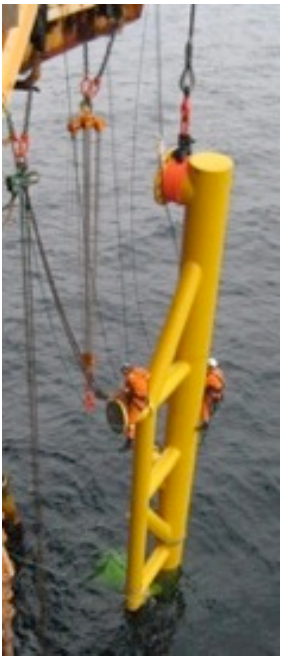
Oppsummering av muligheter

Drift- og vedlikehold

- Generelt løsninger for redusert vedlikeholdskostnader. Økt pålitelighet og oppetid, mer planlagt vedlikehold. Fjernovervåkning av anlegget.
- Fundamentreparasjoner.
- HSE, og trening av personell
- Subsea inspeksjon. Krav til miljømessig og teknisk inspeksjon er et betydelig drift og vedlikeholdskostnad, og det er sannsynlig at det vil øke ytterligere etter hvert som prosjektene bygges i nye omgivelser og forhold. Tilbydere som har kostnadseffektive løsninger, og som redusere behov fysisk tilstedeværelse på strukturen etterspørres.
- Maritime logistikk - løsninger og aktører som reduserer direktekost økt tilgjengelighet eller redusert HSE risiko. Tilkomstsystemer, software løsninger, personelltracking systemer, neste generasjon båter og verktøy.



WCN-klyngen sin styrke

- Spisskompetanse på vedlikehold av stålstrukturer, dvs. spesialiserte leverandører innen
  - Korrosjonsbeskyttelse
  - Monitorering
  - Vedlikeholdsplanlegging
  - Utføring av krevende vedlikeholds-operasjoner
- Erfaring med krevende teknologiutvikling
- Erfaringen hos medlemsbedrifter og klyngemanagement fra konkret arbeid med utvikling/posisjonering av leverandørbedrifter i UK (og til dels Tyskland)
- Og ikke minst det kontaktnettverket som er bygd opp spesielt i UK

Målsettinger for NSOWM II

1) Øke innsikten i kvalifiseringskrav, kontraktsstandarder og beslutningssystemer innenfor bedriftsnettverkets nedslagsfelt.

2) Etablere et konsortium/nettverk av bedrifter med spesialtjenester knyttet til drift & vedlikehold av offshore vind stålfundamenter

3) Bistå teknologibedrifter i SMB-segmentet med markedsavklaring.

4) Identifisere prosjekter eller pilotanlegg egnet for kvalifisering av teknologier og løsninger.