

Up to: 'Unmanned Maintenance'



Program 22-09-2022



13.15 Opening

- Martijn Koelers, LM Windpower Blade Maintenance Future; A glance into the crystal ball of wind turbine blade operation & maintenance
- Jos Gunsing, HZ UAS/Scalda *Crawler development for blade maintenance*
- Koen Hermans, TNO Open questions before we can make real impact with robotic based inspection and repair of rotor blades

14:30 Coffee/tea break with demo's

- Jan Cees Sabel, Fugro Fugro developments in remote offshore inspection
- Ayham Alharbat, Saxion UAS *Physically Interacting Maintenance Drones*
- Pawel Lesniewski, Mistras Group Spider SA-semi-automated ultrasonic system for C-Scan data aquisition on rotor blades



16.00 Network drinks with demo's

Rollout 2023-2030 cumulative one-off direct employment regarding the studied packages (job roles; see appendix 2 of report) of the construction phase (supply and installation) for the period 2023-2030 is 62,000 pers-years. Outlook 2050 cumulative one-off direct employment regarding the studied packages (job roles; see appendix 2 of report) of the construction phase (supply and installation) for the period 2030-2050 is 163,000 person-years.



Challenge:

Unmanned Maintenance

"Zero Downtime & Zero on-site Maintenance in Offshore Wind"







WorldClassMaintenance







Lobby & politiek



ledenvoordeel

The Dutch Network for Smart Maintenance

- Development and execution of cross sectoral innovation projects ullet
- Participation of Asset Owners, Managers, Service Providers & • Knowledge- and Education institutions, Government
- Development of Fieldlab programs for complete industry sectors •













Collaboration with:





NORTHERN NETHERLANDS OFFSHORE WIND

Energy Port Zeeland







Nederlandse WindEnergie Associatie

Mars4earth,

Modular Aerial Robotic Systems for Sustainable living on Earth

FIXAR: new automated composites repair project



Living lab de KAAP Vlissingen => Offshore Renewable Energy O&M Campus

- Shared large-scale innovation test & demo facility
- Located at: Kenniswerf, Vlissingen











ZEPHYROS

Maintenance Robotics in **Offshore Wind**







Call for Action / Business Driver = Need for LCOE reduction

- Lifetime extension
- AEP improvement
- Maintenance logistics reduction
- Elimination of human presence offshore
- Reduction of pollution in the marine environment (also erosion particles)

AIRTuB solution:

Fully autonomous robotized turbine blade maintenance by:

- Robotized inspection and repair system resident in windfarm
- Condition monitoring
- Frequent small high quality repair interventions

Business model:

- Owner Operator (OO) contracts AIRTuB as a Service from Service Provider (SP)
- SP operates on performance contract with OO
- OEM of AIRTuB Equipment rents Robots to SP

Involved partners:





New innovation projects:

- SKILLIANT ERASMUS T-Shore project (Technical Skills for Harmonized Offshore Renewable Energy)
- INTERREG Offshore for Sure (initiatief Peter Scheijgrond)
- JTF Offshore Wind O&M Campus
- MOOI 2022 ASIMOW project (Autonomous System for Inspection and Monitoring of Offshore Windfarms)
- TSE-HER⁺ AIRTuB 2 (see AIRTuB roadmap)
- Smart Drivetrain Lubrication





Viable Offshore Wind (OW) requires Smart Maintenance



STORK

Scalda

TNO innovation for life

smart industry

Zeeland

LM WIND POWER Detect & investigate OW maintenance challenges

Stimulate & facilitate collaboration (triple helix)

Initiate & facilitate (funded) innovation projects

Facilitate testing and demo's in living labs

Provide expert judgement

North Sea Port

TKI WIND OP ZEE

Support knowledge development by sharing



Innovate together – JOIN US!!



www.worldclassmaintenance.com

Fieldlab Zephyros Steering Committee







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