

Norwegian Research Centre for Offshore Wind Technology

www.nowitech.no

Infrastructure

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1




Norwegian Research Centre for Offshore Wind Technology

NOWITECH in brief

Director: John Olav Giæver Tande, john.tande@sintef.no

- ▶ **Objective:**
Pre-competitive research laying a foundation for industrial value creation and cost-effective offshore wind farms. Emphasis on deep sea (+30 m).
- ▶ **R&D partners:** SINTEF, IFE, NTNU + associates: Risø DTU (DK), NREL & MIT (US), Fraunhofer IWES (DE), University of Strathclyde (UK)
- ▶ **Industry partners:** Statkraft, StatoilHydro, Vestavind Kraft, Dong Energy, Lyse, Statnett, Aker Solutions, SmartMotor, NTE, ScanWind, DNV, Vestas, Fugro Oceanor, Devold AMT, TrønderEnergi + associates: Innovation Norway, Enova, NORWEA, NVE, EBL
- ▶ **Work packages:**
 1. Numerical design tools (including wind and hydrodynamics)
 2. Energy conversion system (new materials for lightweight blades & generators)
 3. Novel substructures (bottom-fixed and floaters)
 4. Grid connection and system integration
 5. Operation and maintenance
 6. Concept validation, experiments and demonstration
- ▶ **Total budget (2009-2017):** +NOK 320 millions including 25 PhD/post docs

2



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SINTEF – an independent contract R&D organisation

Research Divisions (employees):

- ▶ Building and Infrastructure (274)
- ▶ ICT (284)
- ▶ Materials and Chemistry (420)
- ▶ Technology and Society (333)
- ▶ Marine
 - MARINTEK (208)
 - SINTEF Fisheries and Aquaculture (120)
- ▶ Petroleum and Energy
 - SINTEF Petroleum Research (125)
 - SINTEF Energy Research (212)

▶ **Total (2008)** 2145 employees from 64 countries / turnover NOK 2.6 billion

▶ **Partner with the Norwegian University of Science and Technology, NTNU and the University of Oslo, UiO**



Offices in Trondheim (main), Oslo, Bergen, Stavanger, Tromsø, Raufoss, Ålesund, Mo i Rana, Glomfjord, Porsgrunn, Denmark, USA, Brazil, Chile


3




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Infrastructure: Labs on campus (+100 in total)

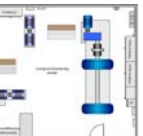
Wind tunnel
(11x3x2 m)




Ocean basin
(80x50x10 m)




Renewable Energy Systems Lab



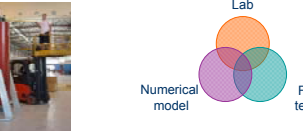
Material testing



Sub-sea lab
(1000 l / 500 bar)




Lab




Numerical model Field testing

4




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Model tests in the Ocean Basin




5



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Infrastructure: Field laboratories


Test station for wind turbines – VIVA AS
Average wind speed 8.4 m/s @ 50 m agl




0.2 MW 0.9 MW 2.3 MW

Photo / Visualisation: InterPares AS

Met station at Frøya
2x 45 m masts
2x 100 m masts
GILL ultrasonic anemometers



6



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HyWind - StatoilHydro

Test station
Met station
StatoilHydro
HyWind

7

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Infrastructure: New investments

- ▶ **Infrastructure CEER offshore wind (RCN, deadline 25.05.09)**
 - Equipment for offshore wind infrastructure (EFOWI)
 - Budget 20 MNOK (APPROVED 29 June 2008; received 17 MNOK)
 - Main components: Met-ocean buoys, LIDARS and scintillimeters
 - Application sent by CMR for NORCOWE and NOWITECH
- ▶ **National Infrastructure (RCN, deadline 04.06.09)**
 - Norwegian Offshore Wind Energy Research Infrastructure (NOWERI)
 - Budget 80 MNOK (application still under validation)
 - Main components: Floating test turbine (~250 kW), offshore met station, bird radar
 - Application sent by CMR for NORCOWE, CEDREN and NOWITECH

Floating test turbine (~250 kW)
Possible EU project?

8

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