



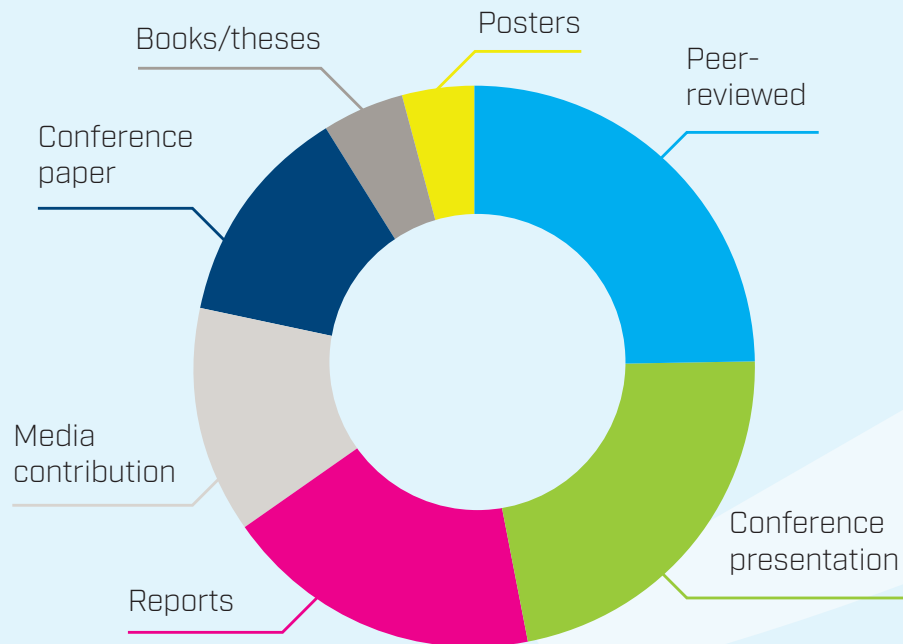
# NOWITECH

## HIGHLIGHTS



## OUTREACH AND COMMUNICATION

864 PUBLICATIONS



## VISION AND GOALS FOR NOWITECH

NOWITECH is an international precompetitive NOK 320 million (2009–2017) research cooperation on offshore wind technology co-financed by the Research Council of Norway, industry and research partners.

### VISION

- Contributing to large scale deployment of deep sea offshore wind turbines,
- An internationally leading research community on offshore wind technology enabling industry partners to be in the forefront.

### OBJECTIVE

Precompetitive research laying a foundation for industrial value creation and cost-effective offshore wind farms. Emphasis is on “deep-sea” (+30 m) including bottom-fixed and floating wind turbines.

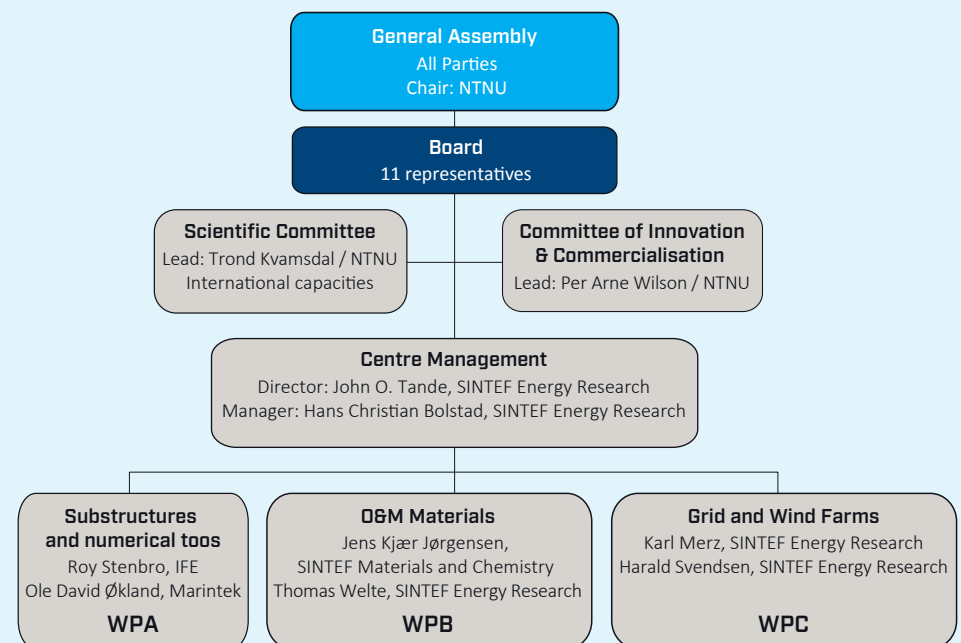
### KEY ISSUES

Innovations, knowledge building and education aiming to reduce the cost of energy from offshore wind farms.

### ORGANIZATION

NOWITECH is organized with a General Assembly (GA), a Board, a Centre Director, a Scientific Committee (SC), a Committee for Innovation and Commercialisation (CIC) and a Centre Management Group (CMG).

The research activities are organised into three work packages (WPs): Substructures and numerical tools (WPA), Operation & Maintenance and Materials (WPB), Grid and Wind Farms (WPC).







# NOWITECH INNOVATIONS

Numerical model


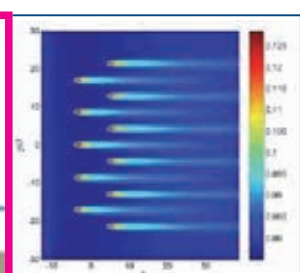
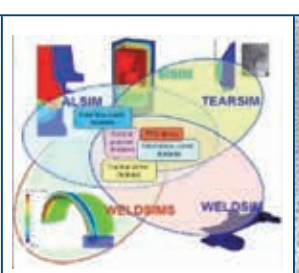
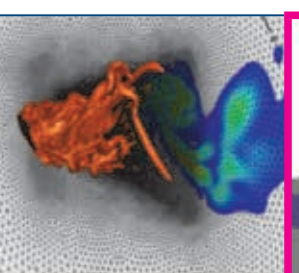
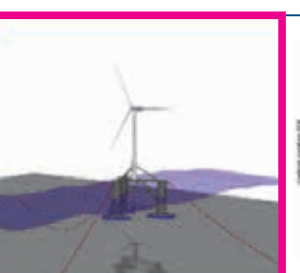
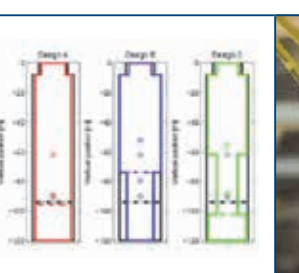
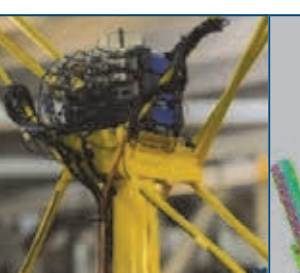
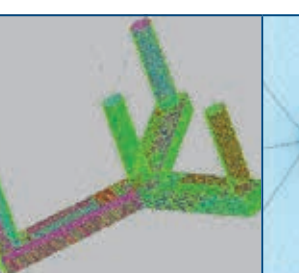
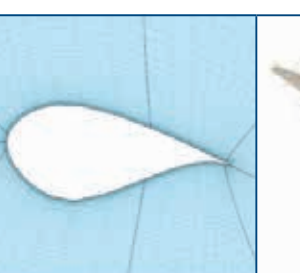



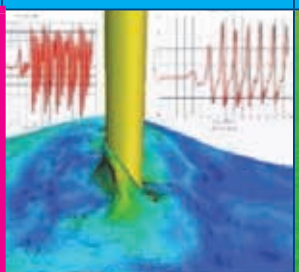
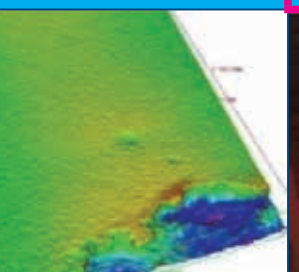

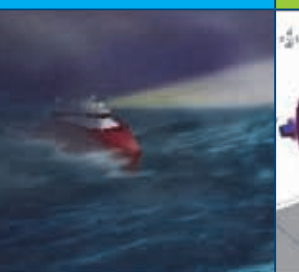
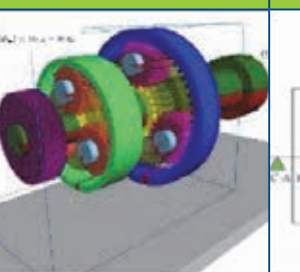
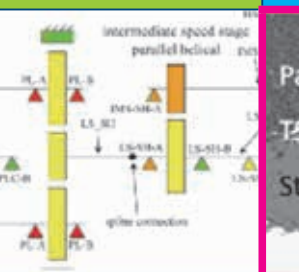



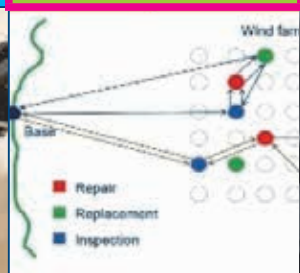

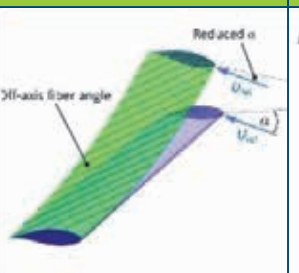
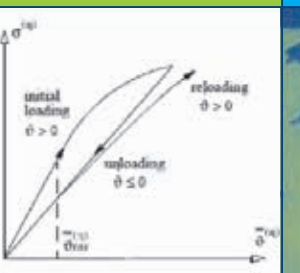
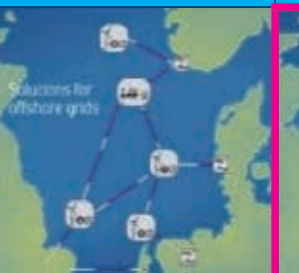

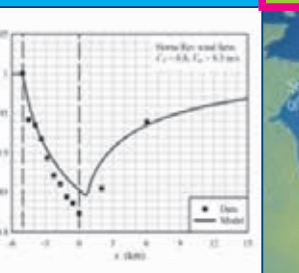




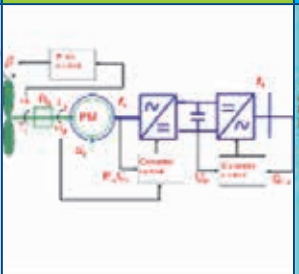
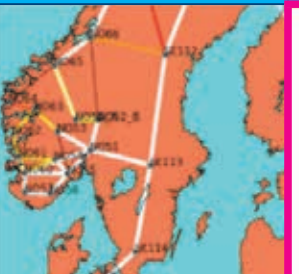

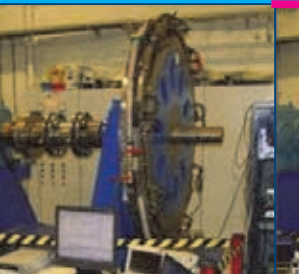
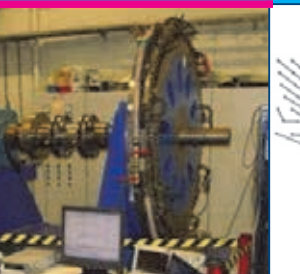
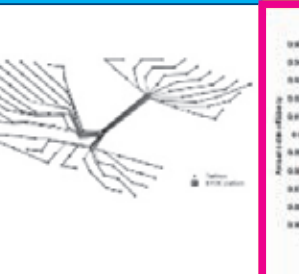
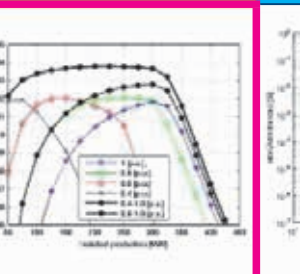
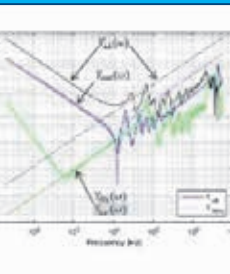
Technology / process

Quantified potential



New business entity  
(spin-off)

## HIGHLIGHTS

									
3Dfloat integrated model TRL7	3DWind park wake model TRL6	INVALS general purpose optimization TRL8	Commercial grade rotor CFD TRL5	SIMO-RIFLEX TRL7	WindOpt TRL4	Real time hybrid model test in ocean basin TRL5	Novel floater TRL5	Variational Multiscale Error Estimator TRL3	www.IFEM.no TRL3
									
ASHES (SIMIS AS) www.ashes.no TRL7	Seawatch Wind Lidar Buoy TRL9	CFD simulation TRL5	Droplet erosion resistant blade coatings TRL3	Droplet erosion testing TRL5	Fleet optimization TRL5	Gearbox fault detection TRL3	Gearbox vulnerability map TRL3	Dual layer corrosion protection coatings TRL5	NOWIcob TRL6
									
REACT/Remote Presence (www.emip.no) TRL5	Routing and scheduling TRL2	Thermally sprayed SiC coatings TRL5	Buckling resistant blades TRL3	Fatigue damage simulation TRL4	PSST Power System Simulation TRL5	NetOp network optimization TRL4	Viper Estimate Energy Output from OWF TRL4	Smartgrid Lab HVDC grid TRL4	Control of multi-terminal HVDC grid TRL4
									
Wind Supply to Oil & Gas TRL3	Turbine control TRL3	Wind turbine electrical interaction TRL4	Network Reduction TRL3	STAS Linear State-Space W.P. Plant Analysis TRL4	PM generator magnetic vibrations TRL4	PM generator integrated design TRL3	Wind farm collection grid optimization TRL2	Long distance AC transmission TRL3	Wideband model of wind farm collection grid TRL2

## NOWITECH INNOVATION AWARD

The NOWITECH Innovation Award was established in 2015 with the aim to stimulate and reward knowledge-based innovation and/or entrepreneurship within the field of offshore wind energy.

*The winning innovation represents, when fully developed, a step change in offshore wind turbine technology, enabling the power from large offshore wind turbines to be transported to shore without the use of any expensive offshore substation. The two award winners Sverre Gjerde and Pål Keim Olsen have carried out critical work in bringing this innovation forward as part of their PhD work at NTNU on high voltage DC generator technology for offshore wind turbines. They have demonstrated the technology in laboratory scale, and their work is well documented.*



*From the prize award at the NOWITECH Innovation Day 15th June 2016: The NOWITECH innovation award winners 2016 are from left: PhD candidate Thomas Sauder; Researcher Erin Bachynski, MARINTEK (now NTNU); Researcher Maxime Thys, MARINTEK; PhD candidate Valentin Chabaud and Researcher Lars Ove Sæther, MARINTEK (not present when the picture was taken).*

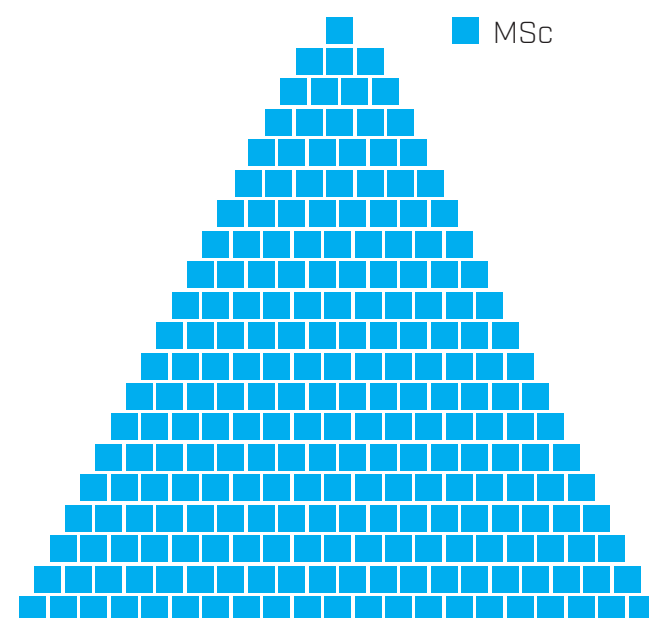




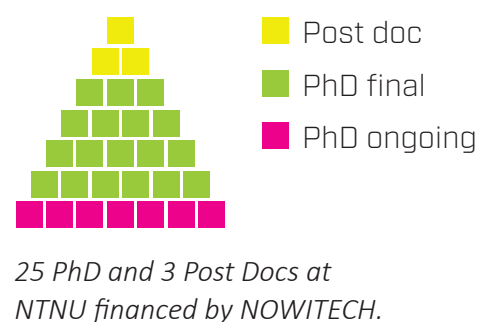


## EDUCATION

The **PhD and Postdoc** studies in NOWITECH are carried out as an integrated part of the work packages. The Scientific Committee (SC) has the overall responsibility for developing the PhD and Postdoc programme. This include an active recruitment strategy, organization of joint PhD forums and training, exposing them to industry and leading international research groups.



229 of MSc theses in offshore wind energy at NTNU since start of NOWITECH.



25 PhD and 3 Post Docs at NTNU financed by NOWITECH.

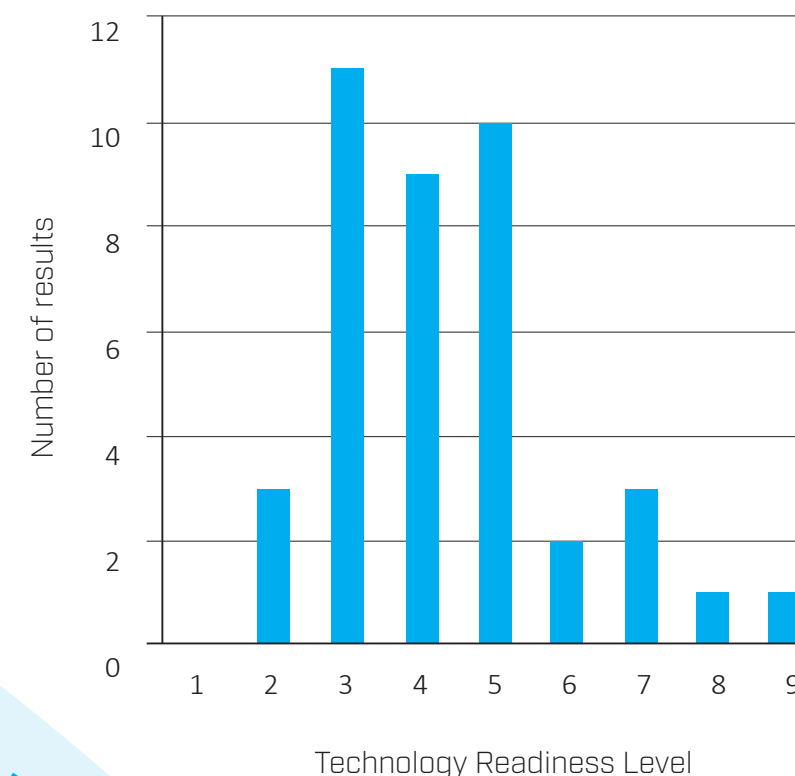
# NOWITECH

INNOVATION

EDUCATION

RESEARCH

## PROGRESS OF INNOVATIONS



**NOWITECH** Norwegian Research Centre for Offshore Wind Technology



## NOWITECH

Norwegian Research Centre  
for Offshore Wind Technology

Host institution

**SINTEF Energi AS** (SINTEF Energy Research)

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**WWW.NOWITECH.NO**



The NOWITECH Partners are listed below:

### THE HOST INSTITUTION:

SINTEF Energy Research

### RESEARCH PARTNERS:

- Norwegian University of Science and Technology (NTNU)
- Institute for Energy Technology (IFE)
- SINTEF Ocean
- Stiftelsen SINTEF

### INDUSTRY PARTNERS:

CD-adapco

DNV GL

DONG Energy

Fedem Technology AS

Fugro OCEANOR AS

Kongsberg Maritime AS

Norsk Automatisering AS

Statkraft Development AS

Statoil Petroleum AS

### ASSOCIATE RESEARCH PARTNERS:

Massachusetts Institute of Technology (MIT), USA

Michigan Technological University (Michigan Tech), USA

National Renewable Energy Laboratory (NREL), USA

DTU, Denmark

Fraunhofer IWES, Germany

University of Strathclyde, UK

TU Delft, Netherlands

Nanyang Technological University (NTU), Singapore

### ASSOCIATE INDUSTRY PARTNERS:

Hexagon Devold AS

Enova

Energy Norway

Innovation Norway

Norwegian Wind Energy Association (NORWEA)

Norwegian Centres of Expertise Instrumentation (NCEI)

NVE

WindCluster Norway

