

# EERA DeepWind'2021 programme

## 18th Deep Sea Offshore Wind R&D Digital Conference

### 13 - 15 January 2021



#### Wednesday 13 January

##### Opening session – Frontiers of science and technology

Chairs: John Olav Tande, SINTEF and Trond Kvamsdal, NTNU

09.00	Opening and welcome by chair
09.10	Tina Bru, Minister of Petroleum and Energy
09.20	Nils Røkke, Exec. Vice President SINTEF and President EERA
09.40	Solutions for floating offshore wind, Geir Olav Berg, CTO and SVP, Aker Offshore Wind
10.00	Break
10.15	Results and plans for EC research on offshore wind, Dr. Carlos Eduardo Lima Da Cunha, Policy Officer, EC
10.35	Arne Eik, Project manager offshore wind Norway, Equinor
10.55	French test beds for floating wind: present contribution and evolution toward a unified operation of open sea infrastructures, Yves Perignon, Manager SEM-REV infrastructure, Research Engineer of CNRS, Centrale Nantes
11.15	Sustainable wind development, Lena Kitzing, Head of Section for Society, Markets and Policy, DTU Wind Energy
11.35	Building a dominant wind sector requires focused R&I, Peter Eecen, Coordinator EERA JP Wind
11.55	Closing by chair
12.00	Break for lunch

##### Parallel sessions

##### 1A) New turbine and generator technology

Chairs: Karl Merz, SINTEF and Prof Gerard van Bussel, TU Delft

##### 1B) Met-ocean conditions

Chairs Joachim Reuder, University of Bergen and Erik Berge, The Norwegian Meteorological Institute

13.00	Introduction by Chair	Introduction by Chair
13.05	Self-Alignment on Single Point Moored Downwind Floater; The Pivot Buoy Concept, L. Voltà, DTU	Analysis of turbulence models fitted to site, and their impact on the response of a bottom fixed wind turbine, A. Nybø, University of Bergen
13.30	Investigation of a dynamically positioned wind turbine, R. Alwan, University of Adelaide	Wind resource assessment uncertainty for a TLP-based met mast, D. Foussekis, CRES
13.50	Gradient-based optimization of a 15 MW wind turbine spar floater with HAWC2-driven aerodynamics, N. Pollini, DTU	Preliminary results of the COTUR project, E. Cheynet, University of Bergen
14.10	On the potential and limitations of a linearized method for design and analysis of floating wind turbines, F. Savenije, TNO	Assessment of representative wind speed vertical profiles in the vicinity of offshore windfarms by means of long-range lidar, J-J. Trujillo, UL International GmbH
14.30	Break	

##### 2A) New turbine and generator technology

15.00	Comparing the Aerodynamic Performance of Floating Offshore Wind Turbines with Betz-Optimised and Linearised Blades, T. Sant, University of Malta
15.20	The effect of speed exclusion zone and active tower dampers on an upwind fixed-hub two-bladed 20 MW wind turbine, F. Anstock, Hamburg University
15.40	Structural Optimisation of Offshore Direct-Drive Wind Turbine Generators including Static and Dynamic Analyses, K. Tartt, University of Strathclyde
16.00	Closing by Chair

##### 2B) Met-ocean conditions

Enhanced design basis for offshore wind farm load calculations based on met-ocean data from a floating LiDAR system, M. Leimeister, Fraunhofer IWES
A Mesoscale Model Sensitivity over the Southern North Sea: Comparison with Measurements and Studying Impacts of Data Assimilation, M. Bakhoday-Paskyabi, University of Bergen
Wake properties and power output of very large wind farms for different meteorological conditions and turbine spacings: A large-eddy simulation case study for the German Bight, O. Maas, Leibniz University Hannover
Closing by Chair

## Thursday 14 January

Parallel sessions	
<b>3A) Grid connection and power system integration</b> Chairs: Kjetil Uhlen, NTNU and Olimpo Anaya-Lara, Strathclyde University	<b>3B) Installation and sub-structures</b> Chairs: Arno van Wingerde, Fraunhofer IWES and Michael Muskulus, NTNU
09.00 Introduction by Chair	Introduction by Chair
09.05 Optimisation of grid infrastructure, H. Svendsen, SINTEF	Fibre Rope Mooring for Floating Wind Turbines, T.A. Nygaard, IFE
09.30 Cost Competitive Wind Farm Frequency and Inertial Support, M. Smailes, ORE Catapult	Comparison of concrete and steel semi-submersible floaters for 10MW wind turbines, S. Oh, Class NK
09.50 Dynamic cable model for layout optimisation purposes in Floating Offshore Wind Farms, J. Rapha, IREC	Which wave episodes drive the extreme response events for a floating wind turbine? H. Bredmose, DTU
10.10 DRYM: a DRY Mate connector dedicated to floating wind: Focus on long term behaviour of sealing system, M. Priser, Naval Energies	Revised floating stability requirements for floating wind turbine structures, Ø. Paulshus, DNV GL
10.30 Break	
<b>4A) Grid connection and power system integration (cont.)</b>	<b>4B) Installation and sub-structures</b>
11.00 Virtual Resistor for Sequential Greenstart of Wind Turbine and Offshore Network, A. Jain, DTU	Optimal Monopile designs for an IEA Wind reference wind farm, A. Natarajan, DTU
11.20 Indirect Current Control Grid Forming Converter Challenges and Limitations During Faults, A. Abdelrahim, University of Strathclyde	Reliability of an offshore wind turbine with an uncertain SN curve, S. Drexler, NTNU
11.40 Virtual Inertia Support by Grid Forming or Grid Following Control of HVDC Converter Terminals – Potential Applications in Multi-Terminal HVDC Grids for Offshore Wind Integration, S. D'Arco, SINTEF	Early age movement in offshore structures with various bearing conditions, J. Henneberg, Leibniz University Hannover - ForWind
12.00 Closing by Chair	Closing by Chair
12.05 Break for lunch	
<b>5A) Energy transition perspectives</b> Chairs: Asgeir Tomasgard, NTNU and Lena Kitzing, DTU	<b>5B) Wind farm optimization and control</b> Chairs: Yngve Heggelund, NORCE and Henrik Bredmose, DTU
13.05 Introduction by Chair	Introduction by Chair
13.10 International Auctions for the Support of Renewable Energy in Offshore Hubs with cross-border interconnection, Mario Garzón González, DTU	Comparative analysis of large offshore wind energy markets, Katherine Dykes, DTU
13.35 How Low Can They Go: Expert Perspectives on the Future Costs of Fixed-Bottom and Floating Offshore Wind Energy, Ryan Wisler, Lawrence Berkeley National Laboratory	Simplified wake modelling for wind farm load prediction, J.B. de Vaal, NTNU
13.55 Local Energy Communities – Incorporating Offshore Wind, Paul McKeever, ORE Catapult	From wind inflow field towards turbine loads: Analysis from a stochastic Galerkin POD model and LES simulations, M. Bakhoday-Paskyabi, University of Bergen
14.15 Quantifying the economic effects of upscaling the Offshore wind industry, Fabian Rocha Aponte, SINTEF	Wind farm set point optimization with surrogate models for load and power output targets, N. Dimitrov, DTU Wind Energy
14.35 Closing by Chair	Closing by Chair
14.40 Break	
15.00 Poster session (programme at next page)	

#### Thursday 14 January (15.00-17.00)

##### Poster session

1. Design and CFD studies of UPWARDS 15 MW virtual wind turbines, B. Panjwani, SINTEF
2. A procedure to redesign a comparable blade structure of a two-bladed turbine based on a three-bladed reference, M. Schütt, HAW Hamburg
3. Verification of Simpack-Moordyn coupling using 15 MW IEA Activefloat, T. Roser, Stuttgart Wind Energy
4. Challenges in Large Offshore Wind Farms with MVDC Collection System, A. Follo, DTU
5. Wind power integration in offshore oil and gas energy systems – operational optimisation, H. Svendsen, SINTEF
6. Challenges related to long HVAC export cables in offshore wind power plants, A. Holdyk, SINTEF
7. Monitoring of Floating Offshore Wind Turbines Using Model-Based Observers, F. Lemmer, Sowento GmbH
8. Operational Metrics for an Offshore Wind Farm and Their Relation to Turbine Access Properties, F. Anderson, CDT
9. Item-based Reliability-centred Life-Cycle Costing using Monte Carlo Simulation, J. Reifferscheidt, SGRE
10. A computer tool for optimisation of marine operations for offshore wind farm installation, E.E. Halvorsen-Weare
11. Condition-Monitoring of Power Electronic Converters, O.C. Spro, SINTEF
12. Development of a Bayesian Network Updating Model for O&M planning of Offshore Wind Structures, T. Elusakin, Cranfield University
13. Low-frequency dynamic wake meandering: comparison of FAST Farm and DIWA software tools, I. Rivera-Arreba, NTNU
14. A hierarchical supervisory wind power plant controller, K. Merz, SINTEF
15. A deep learning based reduced order model framework for assessing urban wind flow: A step in direction of digital twin model for building-integrated wind turbine and urban drone safety, M. Tabib, SINTEF
16. A Numerical Investigation of the Geometric Characteristics of Floating Offshore Wind Turbines Wake under Axial and Yawed Rotor Conditions, T. Sant, University of Malta
17. Evaluation of a low-fidelity hydrodynamic modelling approach for a floating wind turbine mounted on an enhanced spar, G. Gonzalez, DTU Wind Energy
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19. A nested multi-scale modelling framework involving Large Eddy Simulation for assessing urban wind conditions for safe drone operations and urban wind energy, M. Tabib, NTNU
20. Design and application of an experimental hydrofoil test rig, V. Lunestad, University of Bergen
21. Verification of coupling interface between an aeroelastic code and a time domain Rankine solver for completing structural analysis of floating wind turbine foundation design, A. Bakhshandehrostami, DNV GL
22. Assessment of mooring system innovations for a floating offshore wind turbine using coupled dynamic analyses, Q. Pan, SWE, University of Stuttgart
23. Effect of hydrodynamic models on the evaluation of cross-sectional forces in the coupled analysis of floating offshore wind turbines, S. Oh, ClassNK
24. An effect of the averaging time and recording interval on mean wind speeds and significant wave heights, A. Yamaguchi, University of Tokyo
- 25.
26. Direct and fast probabilistic assessment of long term monopile load distribution from combined met-ocean data and fully nonlinear wave kinematics, J.V.T. Sørensen, DHI
27. Exploring the potential of synthetic turbulence in large eddy simulations during stable conditions over ocean wind farms, J. Boeke, Wageningen University and Research, University of Bergen, Delft University of Technology
28. Impact of waves on a large-scale turbine on a floating spar, J. Sirvent, Kingston University
29. An introduction of image processing methods to the wake detection, M. Krutova, University of Bergen
30. A study of nested simulations in PALM LES in application to the wind turbines, M. Krutova, University of Bergen
31. Wind-Wave Interaction and Its Impact on Turbine Wakes Variability under Changing Atmospheric and Sea-State Conditions, M. Bakhoday-Paskyabi, University of Bergen
32. Offshore Wind Turbine Near- and Far-wake Acoustic Noise Propagation: LES-based Study, M. Bakhoday-Paskyabi, University of Bergen
33. Presentation and validation of a simulation environment for floating lidar systems, O. Bischoff, SWE, University of Stuttgart
34. Analysis of wind spectra and coherence in near-neutral stability at sea based on two LES codes, X. Ning, University of Bergen
35. Verification and validation of a micro-scale Finite Element code for atmospheric boundary layer flow in coastal area, Z. Midjiyawa, Meteorological Institute
36. Hybrid analysis and modeling for next generation of digital twins, S. Pawar, Oklahoma State University
37. Assessment of the allowable sea states for offshore wind turbine installation considering weather forecasting uncertainty, M.Wu, NTNU
38. A hybrid POD approach for parametrised turbulent flow problems, V. Tsiolakis, NTNU

## Friday 15 January

### Parallel sessions

#### 6A) Operation & maintenance

Chairs: Iver Bakken Sperstad, SINTEF and Marcel Wiggert, Fraunhofer IWES

#### 6B) Experimental testing and validation

Chairs: Tor Anders Nygaard, IFE, Ole David Økland, SINTEF and Amy Robertson, NREL

09.00	Opening by session chair	Opening by session chair
09.05	How to inspect and maintain 300 km of mooring line for 50 turbines that are 100 nm offshore, A. Argyros, DNV GL	Experimental study of the effect of second order wavemaker theory on the response of large diameter monopile in irregular sea, F.H. Dadmarzi, NTNU
09.30	Corrosion and corrosion monitoring of structural steel in offshore wind turbines, C. Hagen, SINTEF	Uncertainties assessment in real-time hybrid model for ocean basin testing of a floating offshore wind turbine, M. Somoano, IH Cantabria
09.50	Fatigue lifetime estimation of wind turbine blades in a wind farm using damage extrapolation, S. Mozafari, DTU	Identification of wave drift force QTFs for the INO WNDMOOR floating wind turbine based on model test data and comparison with potential flow predictions, N. Fonseca, SINTEF
10.10	Data driven case-study of a wind turbine main-bearing failure, E. de Mello, University of Sheffield	Comparison of dynamic response prediction by using engineering model and numerical water tank for barge platform, H. Otori, University of Tokyo
10.30	Break	
11.00	<b>7A) Operation &amp; maintenance (cont.)</b> Impact of vessel logistics over floating wind farm availability A.R. Luis, University of Cantabria	<b>7B) Experimental testing and validation (cont.)</b> OC6 semisubmersible under waves and constant thrust, S. Gueydon, MARIN
11.20	Limiting wave conditions for the safe maintenance of floating wind turbines, B. Jenkins, University of Strathclyde	Sliding mode control design and its application on floating wind turbine, F. Plestan, Ecole Centrale de Nantes
11.40	Development and Validation of Automatic Data Quality Control Algorithms, A. Venu, DNV GL	Lifetime Extension of Floating Wind Turbines – A Case Study, L. Frøyd, 4Subsea AS
12.00	Estimation of wear and lifetime for improved turbine operation, F. Rehwald, Fraunhofer IEE	Structural monitoring of a 5MW offshore wind turbine, E. Cheynet, University of Bergen
12.20	Closing by Chair	Closing by Chair
12.25	Break for lunch	
	<b>Closing session – Strategic outlook</b> Chairs: John Olav Tande, SINTEF and Michael Muskulus, NTNU	
13.00	Introduction by Chair	
13.05	Layout optimization for floating wind farm design, K. Dykes, Head of Section, Systems Engineering and Optimization, DTU	
13.25	Digital Twin + Wind Energy = True, Trond Kvamsdal, Professor, NTNU	
13.45	The Path to Floating Wind Deployment in the United States, Amy Robertson, Principal Engineer, NREL	
14.05	Making floating wind cost competitive, John Olav Tande, Chief Scientist, SINTEF	
14.20	Poster award and closing	
14.30	End of conference	