TÉCNICO LISBOA

CENTEC

4th International Conference on Renewable Energies Offshore

RENEW 2020

PROGRAMME

12 - 15 October 2020

IST Congress Centre, Lisbon, Portugal

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SCHEDULE AT A GLANCE

Monday, 12 October 2020	
Instituto Superior Técnico – Presence and Online Congress **IST Congress Centre** **Lisbon Time**	
Opening Session – *(9h00-9h20)*	
Coffee-break (9h20-9h30)	
Session 1.1 (9h30-11h00) **Wave Resource Assessment 1**	*Session 1.2 (9h30-11h00)* **German floating offshore wind cluster 1**
Coffee-break (11h00 – 11h30)	
Session 2.1 (11h30-13h00) **Wave Resource Assessment 2**	*Session 2.2 (11h30-13h00)* **German floating offshore wind cluster 2**
Lunch (13h00-14h30)	
Session 3.1 (14h30-16h00) **Wave Resource Assessment 3**	*Session 3.2(14h30-16h00)* **ARCWIND project on Floating Offshore Wind 1**
Coffee-break (16h00-16h30)	
Session 4.1 (16h30-18h00) **Oscillating Water Columns**	*Session 4.2(16h30-18h00)* **ARCWIND project on Floating Offshore Wind 2**
Tuesday, 13 October 2020	
Session 5.1 (9h00-10h30) **Wave Energy Devices 1**	*Session 5.2 (9h00-10h30)* **Wind Energy Devices 1**
Coffee-break (10h30-11h00)	
Session 6.1 (11h00-12h30) **Wave Energy Devices 2**	*Session 6.2 (11h00-12h30)* **Operation and Maintenance of Offshore Wind 1**
Lunch (12h30-14h00)	
Session 7.1 (14h00-15h30) **Wave Energy Devices 3**	*Session 7.2 (14h00-15h30)* **Operation and Maintenance of Offshore Wind 2**
Coffee-break (15h30-16h00)	
Session 8.1 (16h00-17h30) **Wave Energy Devices 4**	*Session 8.2 (16h00-17h30)* **Condition based Maintenance of Offshore Wind Devices**
Wednesday, 14 October 2020	
Session 9.1 (9h00-10h30) **Extreme loads and response of floaters**	*Session 9.2 (9h00-10h30)* **Moorings systems and power cables 1**
Coffee-break (10h30-11h00)	
Session 10.1 (11h00-12h30) **Control of wave energy devices**	*Session 10.2 (11h00-12h30)* **Moorings systems and power cables 2**
Lunch (12h30-14h00)	
Session 11.1 (14h00-15h30) **Economic Considerations**	*Session 11.2 (14h00-15h30)* **Moorings systems and power cables 3**
Coffee-break (15h30-16h00)	
Session 12.1 (16h00-17h30) **Multiuse Platforms**	*Session 12.2 (16h00-17h30)* **Materials and Structural Design**

Thursday, 15 October 2020	
Session 13.1 (9h00-10h30) **Wave and Wind Energy**	*Session 13.2 (9h00-10h30)* **Tidal Energy Devices 1**
Coffee-break (10h30-11h00)	
Session 14.1 (11h00-12h30) **Solar and Wind Energy**	*Session 14.2 (11h00-12h30)* **Tidal Energy Devices 2**
Lunch (12h30-14h00)	
Session 15.1 (14h00-15h30) **Marine Vehicles**	*Session 15.2 (14h00-15h30)* **Power assessment and fluctuating loads in tidal energy devices 1**
	Session 16.2 (16h00-17h30) **Power assessment and fluctuating loads in tidal energy devices 2**

IMPORTANT INFORMATION:

- The sessions with participants at IST **will run in Room 02.1 of the IST Congress Centre**, floor -02.
- The timetable is settled taking into consideration the **Time Zone Lisbon/London time**
- The **permanent use of facemasks** throughout the IST campus is compulsory.
- Groups of more than 10 persons are not allowed anywhere in the IST Campus (except in the classrooms and auditoriums, which have their own allowed capacity).

Guidelines for presentations, questions and answers

- Each paper will have a timeslot of 30 minutes (20 minutes for the presentation + 10 minutes for Q&A).
- The participants that want to ask questions after the presentation should use the facility of ZOOM of “raise hand”, which can be found after clicking on “Participants” in the lower part of the zoom screen. This will allow the Chair to give the word to each participant following the order of registering the interest to intervene. If the question is simple to be written, the participants may also use the chat possibility to write the question there.
- Test all technology (including camera/video, microphone, Wi-Fi, and screen sharing) before the conference.
- Make sure you follow the timetable set out in the programme and the order of presentations.
- Minimise any disturbance during the event by keeping all background noise to a minimum, by muting the microphone if you are not speaking..

SESSIONS IN ALPHABETICAL ORDER

- ARCWIND project on Floating Offshore Wind 1, Monday, 12th October, 2020 (14h30-16h00) Session 3.2
- ARCWIND project on Floating Offshore Wind 2, Monday, 12th October, 2020 (16h30-18h00) Session 4.2
- Condition based Maintenance of Offshore Wind Devices, Tuesday, 13th October, 2020 (16h00-17h30) Session 8.2
- Control of wave energy devices, Wednesday, 14th October, 2020 (11h30-13h00), Session 10.1
- Economic Considerations, Wednesday, 14th October, 2020 (14h00-15h30) Session 11.1
- Extreme loads and response of floaters, Wednesday, 14th October, 2020 (9h30-10h30), Session 9.1
- German floating offshore wind cluster 1, Monday, 12th October, 2020 (9h30-10h30), Session 1.2
- German floating offshore wind cluster 2, Monday, 12th October, 2020 (11h30-13h00), Session 2.2
- Marine Vehicles, Thursday, 15th October, 2020 (14h00-15h30) Session 15.1
- Materials and Structural Design, Wednesday, 14th October, 2020 (16h00-17h30) Session 12.2
- Moorings systems and power cables 1, Wednesday, 14th October, 2020 (9h30-10h30), Session 9.2
- Moorings systems and power cables 2, Wednesday, 14th October, 2020 (11h30-13h00), Session 10.2
- Moorings systems and power cables 3, Wednesday, 14th October, 2020 (14h00-15h30) Session 11.2
- Multiuse Platforms, Wednesday, 14th October, 2020 (16h00-17h30) Session 12.1
- Operation and Maintenance of Offshore Wind 1, Tuesday, 13th October, 2020 (11h30-13h00), Session 6.2
- Operation and Maintenance of Offshore Wind 2, Tuesday, 13th October, 2020 (14h00-15h30) Session 7.2
- Oscillating Water Columns, Monday, 12th October, 2020 (16h30-18h00) Session 4.1
- Power assessment and fluctuating loads in tidal energy devices 1, Thursday, 15th October, 2020 (14h00-15h30) Session 15.2
- Power assessment and fluctuating loads in tidal energy devices 2, Thursday, 15th October, 2020 (16h00-17h30) Session 16.2
- Solar and Wind Energy, Thursday, 15th October, 2020 (11h30-13h00), Session 14.1
- Tidal Energy Devices 1, Thursday, 15th October, 2020 (9h30-10h30), Session 13.2
- Tidal Energy Devices 2, Thursday, 15th October, 2020 (11h30-13h00), Session 14.2
- Wave and Wind Energy, Thursday, 15th October, 2020 (9h30-10h30), Session 13.1
- Wave Energy Devices 1, Tuesday, 13th October, 2020 (9h30-10h30), Session 5.1

- Wave Energy Devices 2, Tuesday, 13th October, 2020 (11h30-13h00), Session 6.1
- Wave Energy Devices 3, Tuesday, 13th October, 2020 (14h00-15h30) Session 7.1
- Wave Energy Devices 4, Tuesday, 13th October, 2020 (16h00-17h30) Session 8.1
- Wave Resource Assessment 1, Monday, 12th October, 2020 (9h30-10h30), Session 1.1
- Wave Resource Assessment 2, Monday, 12th October, 2020 (11h30-13h00), Session 2.1
- Wave Resource Assessment 3, Monday, 12th October, 2020 (14h30-16h00) Session 3.1
- Wind Energy Devices, Tuesday, 13th October, 2020 (9h30-10h30), Session 5.2

Additional information:

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DETAILED PROGRAMME

RENEW 2020 Programme — Monday, 12 October 2020

Opening Session – *(9h00-9h20) – Lisbon / London Time* *Welcome by the RENEW2020 Conference Chairman, Prof. C. Guedes Soares*	
Break (9h20-9h30)	
Session 1.1 (9h30-11h00) **Wave Resource Assessment 1** *Chairperson*: **Takvor Soukissian & George Lavidas** Assessment of the wave resource in the Azores coastal area (2145) M. Gonçalves & C. Guedes Soares Validation of a spectral wave model for wave energy assessments in the Bay of Cadiz (0056) M. Legaz, S. Ponce de León & C. Guedes Soares Effects of varying the transmission coefficient in SNL-SWAN for a wave farm in Peniche (2139) V. Fanti, J. Jacob, A. Pacheco, C. J. E. M. Fortes & E. Didier	*Session 1.2 (9h30-11h00)* **German floating offshore wind cluster 1** *Chairperson*: **Frank Adam & Kimon Argyriadis** Impact damages to organic coating systems of offshore wind turbines - corrosion progress and repair strategies (1076) M. Irmer, A. Momber, T. Marquardt & W. Flügge An advanced structural mechanical approach to fatigue lifetime prediction of submarine cables (1079) C. Otto, C. Schuett, S. Koslec &. P. Menzel Universal gravity anchor solution for floating substructures – experimental studies in a wave flume (1103) R. Topp, F. Adam, T. Baldock & C. M. Wang
Break (11h00 – 11h30)	
Session 2.1 (11h30-13h00) **Wave Resource Assessment 2** *Chairperson*: **Juana Fortes & Sonia Ponce de Léon** Assessment of the wave power resource at Madeira archipelago with SWAN model (2146) D. Silva & C. Guedes Soares Developing marine renewable energy in the Mediterranean: The case of PELAGOS project (0055) T.H. Soukissian, G. Veldeki, M. Damasiotis, C. Perakis, D. Barkouta, I. Chatjigeorgiou & V. Bougiouri. Stochastic storm models for design of wave energy converters and marine structures (2148) V. Laface, F. Arena & E. M. Bitner-Gregersen	*Session 2.2 (11h30-13h00)* **German floating offshore wind cluster 2** *Chairperson*: **Frank Adam & Kimon Argyriadis** Concept of a scalable hybrid microgrid for offshore oil and gas platforms using floating wind turbines (2300) I. M. Iqbar, F.O.B.Othman, H.E. Lee, F. Adam, J. Großmann & M. Beyer Recommendations for the coupled analysis of floating wind turbines on different floater concepts (ORAL PRESENTATION ONLY) A. Manjock & K. Argyriadis Design of production networks for the production of floating substructures for offshore wind turbines (1077) B. Illgen, J. Sender, H. Herholz & W. Flügge
Lunch Break (13h00-14h30)	

Session 3.1 (14h30-16h00) **Wave Resource Assessment 3** *Chairperson*: **Elzbieta Bitner-Gregersen & Mariana Bernardino** Change of wave energy resources in Japan during 5 decades (1092) B. Kamranzad & K. Takaraf Assessing climate change effects on the wave energy in the Canary Islands (064) M. Gonçalves, M. Bernardino & C. Guedes Soares Environmental wave contours for the West Coast of Fuerteventura (2147) G. Clarindo & C. Guedes Soares	*Session 3.2(14h30-16h00)* **ARCWIND project on Floating Offshore Wind 1** *Chairperson*: **Antonio Souto-Iglesias & Felipe Vittori** Response dynamics of a free-float capable tension leg platform for a 10 MW wind turbine at the Northern Iberian Peninsula (003) E. Uzunoglu & C. Guedes Soares Hybrid scaled testing of a 10MW TLP floating wind turbine using the SiL method to integrate the rotor thrust and moments (061) F. Vittori, O. Pires, J. Azcona, E. Uzunoglu, C. Guedes Soares, R. Zamora Rodrigues & A. Souto-Iglesias Tuned mass damper effects on the tendon responses of a novel 10 MW multi-body floating offshore wind turbine platform. (0012) Y. Yang, M. Bashir, C. Sakaris, S. Loughney, J. Wang, C. Michailides & C. Li
Break (16h00-16h30)	
Session 4.1 (16h30-18h00) **Oscillating Water Columns** *Chairperson*: **Diego Vicinanza & Gregorio Iglesias** Numerical assessment of wave induced loads on an Oscillating Water Column carapace (0049) M. Batlle Martin, G. Pinon & J. Reveillon Preliminary experimental results of a 1:10th-scale model of the spar-buoy OWC for oceanographic purposes (0068) C.. L. G. Oikonomou, R. P. F. Gomes, L. M. C. Gato, A. F. O. Falcão Hydrodynamic performance assessment of dual chamber shoreline Oscillating Water Column devices (2160) K. Rezanejad, A. Abbasnia & C. Guedes Soares	*Session 4.2(16h30-18h00)* **ARCWIND project on Floating Offshore Wind 2** *Chairperson*: **Constantine Michailides & Sean Loughney** Application of a Multiple-Attribute Decision-Analysis methodology for site selection of floating offshore wind farms off the West coast of Ireland (2138) S. Loughney, J. Wang, M. Bashir, M. Armin & Y. Yang Grid capacity for floating offshore wind integration The Portuguese Case (1078) N. Amaro, A. Egorov & F. Reis Transportation tests of CENTEC-TLP concept in waves (1112) J. Mas-Soler, E. Uzunoglu, C. Guedes Soares, G. Bulian & A. Souto-Iglesias

RENEW 2020 Programme Tuesday, 13 October 2020

Session 5.1 (9h00-10h30) **Wave Energy Devices 1** *Chairperson*: **Lorenzo Cappietti & Kourosh Rezanejad** Identifying compatible locations for wave energy exploration with different wave energy devices in Madeira Islands (041) S. Ramos, H. Diaz, G. Lavidas & C. Guedes Soares	*Session 5.2 (9h00-10h30)* **Wind Energy Devices** *Chairperson*: **Spyros Mavrakos & Erin Bachynski** Breaking wave loads and y+ value on offshore wind turbine monopoles (078) E. M. Chatzimarkou, C. Michailides &T. Onoufriou

Upscaling wave energy converters: Size vs. modularity (027) J. Scriven, J. Cruz & M. Atcheson Cruz A feasibility study on downsizing of power take off system of wave energy converters (038) J. Tan, H. Polinder, P. Wellens & S. Miedema	Mean second-order wave drift forces contour of a floating structure concept for wind energy exploitation (0058) T. P. Mazarakos & S. A. Mavrakos Hydrodynamic investigation of a large monopile for offshore wind applications: numerical and experimental approaches (0047) A. Moghtadaei, M. Karimirad, C. Young & T. Whittaker
Break (10h30-11h00)	
Session 6.1 (11h00-12h30) **Wave Energy Devices 2** *Chairperson*: **Deborah Greaves & Peter Troch** Joint optimisation of geometry and mass distribution of wave energy converters (1083) A. Garcia-Teruel & D. I. M. Forehand Evaluation of the power performance of various wave energy conversion concepts for Faroese coastal waters (042) B. Joensen, B. A. Niclasen & H. B. Bingham A hydrodynamic model of the M4 wave energy converter using the Moving Frame Method (2131) J. Nyland, D. Lande-Sudall, P. K. Stansby & T. Impelluso	*Session 6.2 (11h00-12h30)* **Operation and Maintenance of Offshore Wind 1** *Chairperson*: **Mahmood Shafiee & Hans Bihs** Failure Mode Identification and Effect Analysis of Offshore Wind Turbines and Substations (2149) H. Díaz & C. Guedes Soares Failure analysis of floating offshore wind turbine technologies (1099) M. Shafiee, G. Stamelos, M. M. Aziminia, T. Elusakin, T. Adedipe & F. Dinmohammadi Improvements in the O&M modelling of floating offshore wind farms (1089) G. Rinaldi, P. R. Thies & L. Johanning
Lunch break (12h30-14h00)	
Session 7.1 (14h00-15h30) **Wave Energy Devices 3** *Chairperson*: **Jonas W. Ringsberg & Lucia Margheritini** Power fluctuation analysis for WEC farms (2118) F. Ferri Validation study for a heaving sphere in waves (2155) H. Islam & C. Guedes Soares Design and evaluation of linear and rotational generator scale models for wave tank testing (2128) Z. Shahroozi, M. Eriksson, M. Göteman & J. Engström	*Session 7.2 (14h00-15h30)* **Operation and Maintenance of Offshore Wind 2** *Chairperson*: **Angelo P. Teixeira & Musa Bashir** Deep reinforcement learning for maintenance planning of offshore vessel transfer (008) J. Chatterjee & N. Dethlefs A Review of maintenance strategy optimization for wind energy (0069) M. Li, X. Jiang, H. Polinder & R. R. Negenborn. Optimal maintenance management of offshore wind farms by genetic algorithms (1116) T. Benmessaoud & F. P. García Márquez
Break (15h30-16h00)	
Session 8.1 (16h00-17h30) **Wave Energy Devices 4** *Chairperson*: **Francisco Taveira Pinto & Gregorio Iglesias** Experimental study of a navigational buoy powered by wave energy through triboelectric nanogenerators (2136)	*Session 8.2 (16h00-17h30)* **Condition based Maintenance of Offshore Wind Devices** *Chairperson*: **Fausto Pedro García Márquez & José Sobral**

D. Clemente, T. Cabral, P. Rosa-Santos, F. Taveira-Pinto, C. Rodrigues, J. M. Correia, A. Pereira, J. Ventura, N. Mathias, R. Marini & T. Morais Wave power extraction by a submerged piezoelectric plate (0077) S. Zheng, M. H. Meylan, D. Greaves & G. Iglesias WaveSAX device, power take-off optimization (ORAL PRESENTATION ONLY) M. Peviani, A. Danelli & G. Agate	An Online ANFIS-PF hybrid RUL prediction model with an application to gearbox (1101) A. Govahianjahromi, D. Lee & C. K. Mechefske Detection of structural defects in wind turbine blades employing Guided Waves and Machine Learning methods (2119) P. Sanchez Granados, C. Q. Gómez Muñoz & F. P. García Márquez Pitch bearing case study with supervisory control data of 7MW wind turbine (1090) W. Song, K. A. Karikari-Boateng & H. Lee

RENEW 2020 Programme Wednesday, 14 October 2020

Session 9.1 (9h00-10h30) **Extreme loads and response of floaters** *Chairperson*: **Peter Stansby & Malin Goteman** SPH modelling of extreme loads exerted onto a point absorber WEC (1084) A.J. Crespo, P. Ropero, J.M. Dominguez, M. Gómez-Gesteira, C. Altomare, B. Tagliafierro & G. Viccione Response of the multi-float WEC M4 in focussed waves using SPH (1117) E. Carpintero Moreno, G. Fourtakas, P. K. Stansby & A. J. Crespo Comparison of dynamic mesh methods in OpenFOAM for a WEC in extreme waves (1108) E. Katsidoniotaki & M. Göteman	*Session 9.2 (9h00-10h30)* **Moorings systems and power cables 1** *Chairperson*: **Lars Johanning & Spyros Mavrakos** Round robin testing of synthetic fibre ropes for application in marine renewable energy (1121) F. Khalid, P. Halswell, P. Davies, P. R. Thies, N. Lacotte & L. Johanning Performance assessment of a tether component installed on elastic mooring lines for floating wave energy converters (0015) S.-H. Yang & J.W. Ringsberg Experimental study of nonlinear behaviour of a nylon mooring rope at different scales (2153) S. Wang, S. Xu, C. Guedes Soares, Y. Zhang, H. Liu & L. Li
Break (10h30-11h00)	
Session 10.1 (11h00-12h30) **Control of wave energy devices** *Chairperson*: **John Ringwood & Mário Mendes** Black-box modelling of a three-body hinge-barge wave energy device via forces responses (2112) F. Jaramillo-Lopez, B. Flannery, J. Ringwood & J. Murphy Linear optimal control on a multi-PTO wave energy converter M4 with performance analysis (1118) Z. Liao, G. Li & P. K. Stansby Effect of non-ideal power take-off on the electric output power of a wave energy converter under suboptimal control. (0059)	*Session 10.2 (11h00-12h30)* **Moorings systems and power cables 2** *Chairperson*: **Jonas W. Ringsberg & Philipp Thies** Effect of mooring line attachment point on parametrically excited motions and power extraction in the Spar-buoy OWC device (005) G. Giorgi, G. Bracco, G. Mattiazzo & R. P.F. Gomes Efficiency of an oscillating water column device for several mooring systems (0036) D. N. Konispoliatis, A. S. Mavrakos & S. A. Mavrakos.

M. F. Pettersen, P. B. Garcia-Rosa, M. Molinas & O. B. Fosso	Experiment aided development of a hybrid mooring and foundation concept for marine energy applications (1086) G. Rinaldi, J. Morton, P. R. Thies, M. Sansom & L. Johanning
Lunch break (12h30-14h00)	
Session 11.1 (14h00-15h30) **Economic Considerations** *Chairperson*: **Diego Vicinanza & Ludovic Chatellier** Technological and commercial comparison of OWC and SSG wave energy converters built into breakwaters (082) I. Margheritini, P. Frigaard & G. Iglesias. The economics of floating offshore wind - A comparison of different methods (040) A. Garcia-Teruel & H. Jeffrey Dynamic HV Cables with AL conductors for Floating Offshore Wind Turbines: A cost & behavior comparative study. (1107) K. Grivas, A. Moraiti, G. Georgallis, G. Rinaldi, P. R. Thies & L. Johanning	*Session 11.2 (14h00-15h30)* **Moorings systems and power cables 3** *Chairperson*: **Lars Johanning & Shan Wang** Taut elastic mooring characteristics for the multi-float M4 wave energy converter (1111) P. K. Stansby & E. Carpintero Moreno Assessment of potential sites for a non-linear mooring system in floating offshore wind applications (1104) F. Khalid, P. R. Thies, D. Newsam & L. Johanning Survivability analysis of the mooring system of a combined wave and wind harvesting concept (2143) M. Kamarlouei, J. Gaspar, T. S. Hallak, F. Thiebaut & C. Guedes Soares
Break (15h30-16h00)	
Session 12.1 (16h00-17h30) **Multiuse Platforms** *Chairperson*: **Maurizio Collu & Lorenzo Cappietti** Floating power plant hybrid wind-wave platform: CFD simulations of the chamber geometry (0072) M. Antón, C. Eskilsson, J. Andersen, S. Thomas & M. B. Kramer Development and validation of a coupled numerical model for offshore floating multi-purpose platforms (024) L. Li & M. Collu, Y. Gao, C. Ruzzo, F. Arena, F. Taruffi & S. Muggiasca & M. Belloli On the arrangement of two experimental activities on a novel multi-purpose floating structure concept (2151) C. Ruzzo, A. Romolo, G. Malara, F. Arena, F. Taruffi, S. Muggiasca, M. Belloli, B. Bouscasse, J. Ohana, A. Santoro, K. Aubriere, G. Brizzi, M. Collu, P. Corvaglia & F. Lagasco	*Session 12.2 (16h00-17h30)* **Materials and Structural Design** *Chairperson*: **Franck Schoefs & Yordan Garbatov** Structural analysis of the offshore wind turbine tower. (0057) M. Legaz, P. Mayorga, J. Fernandez, J. Muńoz & M. Bruno Computation of discretization error bounds on the fatigue damage of a shear plate (2124) L. Mell, V. Rey, F. Schoefs & B. Rocher Towards a high-fidelity simulation environment for structural integrity assessment of floating wind energy platforms (2140) I. Souto-Canteli, M. Penalba, M. Martinez-Agirre, M. Ezkurra, J.-A.R Esnaola, I. Llavori, J.-I. Aizpurua

Session 13.1 (9h00-10h30) **Wave and Wind Energy** *Chairperson:* **Madjid Karimirad & Emre Uzunoglu** Multi-criteria analysis to rank offshore renewable technologies to support deep-water oil and gas production (011) A. R. Novgorodcev Jr. & A. Jarquín-Laguna Selection of a PTO and a relief valve for the Roccella Jonica wave power plant (1106) A. Scialò, J. C. C. Henriques, G. Malara, F. Arena & L. M. C. Gato Design of power take–offs for combined wave and wind harvesting floating platforms. (2141) J. F. Gaspar, M. Kamarlouei, M. Calvário & C. Guedes Soares	*Session 13.2 (9h00-10h30)* **Tidal Energy Devices 1** *Chairperson*: **Alexei Sentchev & Michael Tognieri** Hydrodynamic analysis of turbine control through blade-deformation (076) F. Zilic de Arcos, C. R. Vogel & R. H. J. Willden Hybrid viscous/inviscid modelling of a hydrokinetic turbine performance and wake field (0054) M. Gregori, D. Calcagni, F. Salvatore, F. Di Felice, F. Alves Pereira & R Camussi. Analysis of fixed turbine operating conditions with and without a shock capture scheme (2144) L. M. Flores Mateos & M. Hartnett
Break (10h30-11h00)	
Session 14.1 (11h00-12h30) **Solar and Wind Energy** *Chairperson*: **Zhen Gao & Madjid Karimirad** Hydrodynamic investigation of design parameters for a cylindrical type floating solar system (0073) D. Friel, M. Karimirad, T. Whittaker & J. Doran Development of a universal useable and in series production manufacturable buoyancy body design for TLP and semi-submersible (2115) M. Lutz, D. Walia & F. Adam Installation of pre-assembled offshore floating wind turbine using a floating vessel (1075) M. A. A. A. Hassan & C. Guedes Soares.	*Session 14.2 (11h00-12h30)* **Tidal Energy Devices 2** *Chairperson*: **Grégory Pinon & Michael Hartnett** Experimental testing of the performance and interference effects of a cross-stream array of tidal turbines (0010) J. McNaughton, B. Cao, S. Ettema, F. Zilic de Arcos, C. R. Vogel & R. H. J. Willden. Experimental investigation of the performance of a sidewall-constrained tidal turbine fence (0045) S. Ettema, J. McNaughton, C.R. Vogel & R.H.J. Willden Laboratory scale tests of a floating tidal turbine (0044) S. Walker, L. Cappietti, I. Simonetti & A. Esposito
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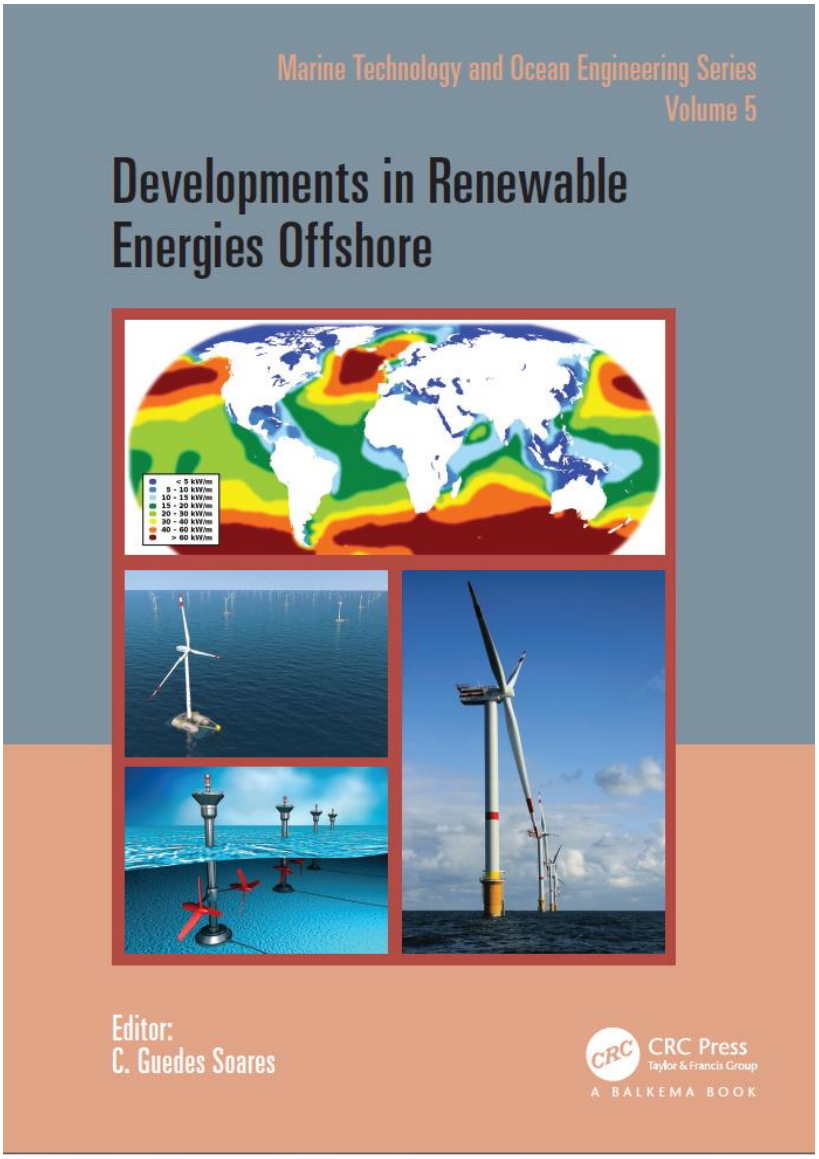
Session 15.1 (14h00-15h30) **Marine Vehicles** *Chairperson*: **Philipe Thies & Lorenzo Cappietti** New approaches for renewable energy management in autonomous marine vehicles (2114) P.J. Bernalte, F.P. García Márquez, S. Marini, F. Bonofoglio, L. Barbieri, N. Gjeci, E.Ottaviani, S. Govindaraj, S. Coene, A. But, J. Pedersen, C. Vetke, F. Madricardo, F.Foglini, M. Antonini, S. Montenegro, P. Weiss, K. Nowak, M. Peer, T. Gobert, A. Turetta, E. Chatzidouros, D. Lee, T. Yamas & M. Papaelias	*Session 15.2 (14h00-15h30)* **Power assessment and fluctuating loads in tidal energy devices 1** *Chairperson*: **Richard Willden & Slyvain Guillou** Application of VMEA to assess uncertainties affecting tidal devices: preliminary findings using tank-scale turbines (0025) E. Jump, I. Papachristou, A. Macleod, M. Slama, G. Pinon, F. Represas, J. Grande, E. Nicolas J. Marcille & M. Togneri

Modelling and assessment of ROV capacity within an autonomous offshore intervention system (2122) C. Zhao, P. R. Thies, J. Cowles & L. Johanning Semi-empirical model study of propulsion with in-line tandem flapping hydrofoils (2134) D. B. S. Lopes, J. A. C. Falcão de Campos, A. J. N. A. Sarmento & G. Vaz	Implementing varying blade profile and Reynolds Number in BEMT code (0026) I. Evans, M. Togneri, T. Lake, R. Gwenter, I. Masters, G. Pinon & M. Slama Blade root load variations on two scaled industrial tidal turbines. (0039) M. Slama, G. Pinon, M. Togneri, E. Jump, B. Gaurier, G. Germain, F. Represas, J. Grande, E. Nicolas & J. Marcille.
	Session 16.2 (16h00-17h30) **Power assessment and fluctuating loads in tidal energy devices 2** *Chairperson*: **Myriam Slama & Grégory Pinon** Unsteady loading of a floating tidal turbine oscillating in a pendulum motion (2154) M. H. B. Osman & R. H. J. Willden Turbulence characterization at tidal-stream energy site in Alderney Race (1115) A. Sentchev, M. Thiébaut & S. Guillou Coupled flow-wave modelling for regional tidal site characterization in the English Channel (2130) J. Hardwick, I. G. C. Ashton, E. Mackay, H. C. M. Smith & P. R. Thies



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