15th ewtec 2023

European Wave and Tidal Energy Conference Series

PRELIMINARY PROGRAMME

for the 15th European Wave & Tidal Energy Conference

BILBAO

3rd -7th SEPTEMBER 2023

	Day 1 Sunday September 3	Day 2 Monday September 4	Day 3 Tuesday September 5	Day 4 Wednesday September 6	Day 5 Thursday September 7	Day 6 Friday September 8
08:00-08:30		Registration *(Main Hall)*	Registration *(Main Hall)*	Registration *(Main Hall)*	Registration *(Main Hall)*	
08:30-09:00						
09:00-09:30			Oral presentation WDD / Oral presentation TDD / Oral presentation WHM / Oral presentation THM	Oral presentation WDD / Oral presentation TDD / Oral presentation TRC / Oral presentation EIA	Oral presentation GPC / Oral presentation WRC / Oral presentation ESP	
09:30-10:00	Bus departure to Getxo Regatta					
10:00-10:30		Opening Ceremony *(Mitxelena Auditorium)*				Social programme Guided tour through the river by BILBOATS
10:30-11:00			Refreshments, networking & posters exhibition (Terrace and Chillida room)			
11:00-11:30		Keynote lectures + JRL-ORE *(Mitxelena Auditorium)*	Oral presentation WDD / Oral presentation TDD / Oral presentation WHM / Oral presentation THM	Oral presentation WDD / Oral presentation TDD / Oral presentation TRC	Oral presentation WDD / Oral presentation GPC / Oral presentation WRC / Oral presentation ESP	
11:30-12:00	**Regatta** La mar en calma Sailing School in Getxo (10:00-15:00h)					
12:00-12:30						
12:30-13:00		Lunch *(Terrace and Chillida room)*				
13:00-13:30						
13:30-14:00						
14:00-14:30		Oral presentation WHM / Oral presentation ONM / Oral presentation SMM / Oral presentation GPC	Oral presentation WDD / Oral presentation TDD / Oral presentation WHM / Oral presentation THM	Oral presentation WDD / Oral presentation TRC / Oral presentation EIA	Oral presentation WDD / Oral presentation WRC / Oral presentation ESP	
14:30-15:00	Bus returning to Bilbao					
15:00-15:30						
15:30-16:00		Refreshments, networking & posters exhibition *(Terrace and Chillida room)*			Closing Ceremony	
16:00-16:30		Side event 1 / Side event 2 / Side event 3	Side event 4 / Side event 5 / Side event 6	Side event 7 / Side event 8 / Side event 9		
16:30-17:00						
17:00-17:30						
17:30-18:00	2 Buses departing to Olatua Building Getxo Cruise Terminal every 30 minutes (around 6 buses)	Oral presentation WHM / Oral presentation SMF / Oral presentation SMM / Oral presentation GPC	Oral presentation WDD / Oral presentation WHM / Oral presentation THM		Technical visits: Option 1: MUTRIKU Option 2: BIMEP	
18:00-18:30						
18:30-19:00						
19:00-19:30	**Welcome Reception** *(Olatua Building Getxo Cruise Terminal)* Registration available		Technical Committee Meeting *(Elhuyar room)*			
19:30-20:00						
20:00-20:30		Social programme Pintxos Route	(Track Directors Dinner)	Opening of the galleries of the Museum (exclusive for Delegates)		
20:30-21:00						
21:00-21:30					(Executive Board Meeting and Dinner)	
21:30-22:00				Gala Dinner *(Atrium of the Guggenheim Museum)*		
22:00-22:30	All Buses returning to Bilbao					
22:30-23:00						
23:00-23:30						

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Colour code:	Olatua Building	Mitxelena (440 pax)	Main Hall	Barandiarán (16 pax)	Elhuyar (24 pax)	Chillida (220 m2)	Oteiza (60 pax)	Terrace (800+400 m2)	Baroja (160 pax)	Laboa (110 m2)	Arriaga (60 pax)

Tracks:

- THM: Tidal hydrodynamic modelling
- WHM: Wave hydrodynamic modelling
- EIA: Environemental impact and appraisal
- WDD: Wave device development and testing
- GPC: Grid integration, power take-off and control
- WRC: Wave resource characterization
- ONM: Operations, maintenance and decommissioning
- TDD: Tidal device development and testing
- TRC: Tidal resource characterization
- ESP: Economical, social, legal and political aspects of ocean energy
- SMF: Station-keeping, moorings and foundations
- SMM: Structural mechanics - materials, fatigue, loadings

Important Note: The Organizing Committee of the EWTEC'23 reserves the right to modify this program at any time according to the circumnstances

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Monday September 4

08:00-10:00	**Registration** *(Main Hall)*					08:00-10:00
10:00-10:50	**Opening Ceremony**	**Mitxelena Auditorium**	Jesús M. Blanco	Local Committee Chairman	10:00-10:10	
			Cameron Johnstone	EWTEC Executive Board Chair	10:10-10:20	
			Jose L. Villate	Local Committee Chairman	10:20-10:30	
			Gorka Moreno	Vicerector campus UPV/EHU	10:30-10:40	
			Arantxa Tapia	Basque Government	10:40-10:50	
11:00-12:20	**Keynote lectures** *(Mitxelena Auditorium)*	**Mitxelena Auditorium**	Iñigo Losada	IH-Cantabria	11:00-11:40	
			Andrew Scott	Orbital Marine Power	11:40-12:20	
12:20-12:30	**JRL-ORE**	**Mitxelena Auditorium**	Eider Robles	JRL-ORE	12:20-12:30	
12:30-14:00	**Lunch & posters exhibition** *(Terrace and Chillida room)*					12:30-14:00

		Room /Track	Chairman	Paper ID	Title	Presenter	
14:00-15:30	Oral presentations	**Baroja/ Wave hydrodynamic modelling**	Deborah Greaves	142	Numerical modelling of a box-type and bottom-detached oscillating water column wave energy conversion device: a comparison with experimental data and between BEM and CFD numerical modelling	Vaibhav Raghavan	14:00-14:15
				192	Numerical and experimental studies of the effects of WEC motion on a combined wind-wave energy platform	WeonCheol Koo	14:15-14:30
				265	Fast time-domain model for an array of interactive point-absorbers	Charitini Stavropoulou	14:30-14:45
				547	Farm Layout Optimization of an innovative type of Hybrid Floating Breakwater	Sara Russo	14:45-15:00
				163	A CFD-FEM analysis for Anaconda WEC with mooring lines	Yang Huang	15:00-15:15
				153	CMIP6 wave climate simulation in the European North East Atlantic Basin using WaveWatch III	Ponni Maya	15:15-15:30
		Laboa/ Operations, maintenance and decommissioning	Gregorio Iglesias	173	A method for the growth inhibition of biofouling in Sihwa Tidal Power Plant	SeoYeong Lee	14:00-14:15
				262	Informing Early Design Decisions Through Functional Analysis of Maintenance Drivers: Applications in Marine Renewables	Nathan Algarra	14:15-14:30
				259	Lubrication of offshore mechanical components: towards sustainable & reliable power production	Juan Guillermo Zapita Tamayo	14:30-14:45
				535	SEASNAKE: Impact - Marine operations modelling for evidence-based results detailing the impact of using a new fully dynamic cable design for ocean energy devices.	Ben Kennedy	14:45-15:00
							15:00-15:15
							15:15-15:30
		Arriaga/ Structural mechanics - materials, fatigue, loadings	Claudio Lugni	181	Structural testing and numerical modelling of a glass fibre-reinforced composite demonstrator for turbine blades	Yadong Jiang	14:00-14:15
				469	Antifouling and anticorrosive prevention with ceramic coatings on offshore structures for renewable energy	David Sanchez	14:15-14:30
				389	Understanding the force motion trade off of rigid and hinged floating platforms for marine renewables	Abel Arredondo-Galeana	14:30-14:45
				147	Reducing the uncertainty of ULS load estimates in offshore structural design	Joao Cruz	14:45-15:00
				222	Critical Feature and Seawater Testing of Cross-Flow Rotor Components Fabricated with Additive Manufacturing	Rob Cavagnaro	15:00-15:15
				267	Material characterization of elastomeric bearing elements in Wave Energy Converters	Rimmie Duraisamy	15:15-15:30
		Oteiza/ Grid integration, power take-off and control	John Ringwood	174	Experimental validation of rollout-based model predictive control for wave energy converters on a two-body, taut-moored point absorber prototype	Zechuan Lin	14:00-14:15
				288	Control co-design and uncertainty analysis of the LUPA's PTO using WecOptTool	Carlos Michelen Strofer	14:15-14:30
				396	Tidal barrage operation optimization using moment-based control	Agustina Skiarski	14:30-14:45
				434	Laboratory Tests Assessment of a Mechanical Sensor-less MPPT Control Strategy for Tidal Turbines	Mohammad Rafiei	14:45-15:00
				590	Design considerations for a hybrid wind-wave platform under energy-maximising control	Maria Luisa Celesti	15:00-15:15
				468	Wave Excitation Force Estimation for a Multi-DoF WEC via a Cubature Kalman Filter: Improved Design and Results	Jiamin Zhu	15:15-15:30
15:30-16:00	**Refreshments, networking & posters exhibition** *(Terrace and Chillida room)*						15:30-16:00
16:00-17:30	Side events	**Mitxelena/Side event 1**	**"Supergen ORE Hub Wave and Tidal Energy research and opportunities" (by SUPERGEN-ORE HUB - University of Plymouth)**				16:00-17:30
		Baroja/Side event 2	**"Distributed Embedded Energy Conversion Technology (DEEC-Tec)" (by Wave Energy Scotland / NREL)**				16:00-17:30
		Arriaga/Side event 3	**"Morphing Blades: New-Concept Tidal and Wind Turbine Blades for Unsteady Load Mitigation" (by University of Edinburgh)**				16:00-17:30

		Room /Track	Chairman	Paper ID	Title	Presenter	
17:30-19:00	Oral presentations	**Baroja/ Wave hydrodynamic modelling**	Siming Zheng	152	An Experimental Study for Wave Energy Converter of Wavestar Type using Real-Time Hybrid Model Testing Technique	Yoon-Jin Ha	17:30-17:45
				643	Demonstrating real-time hydrodynamic motion response in force control for regular waves in a robotized dry test rig with a point-absorber WEC	Dana Salar	17:45-18:00
				534	Data-base Hydrodynamic Coefficients Interpolator for Control Co-Design of Wave Energy Converters	Demian Garcia-Violini	18:00-18:15
				261	Review of TEAMER Awards for WEC-Sim Support	Beatrice Battisti	18:15-18:30
				182	Performance Enhancement of Fluidic Diode for a Wave Energy System through Genetic Algorithm	Emeel Kerikous	18:30-18:45
				272	Parametric resonance: a risk to be avoided or an opportunity to be exploited? A case for a 2:1 wave energy converter	Giuseppe Giorgi	18:45-19:00
		Laboa/ Station-keeping, moorings and foundations	Iñaki Zabala	344	Control synthesis via Impedance-Matching in panchromatic conditions: a generalised framework for moored systems	Bruno Paduano	17:30-17:45
				582	Hydrodynamic Response of Mocean Wave Energy Converter in Extreme Waves	John Ashlin Samuel	17:45-18:00
				427	The Dynamic response of floating offshore renewable energy devices: Sensitivity to mooring rope stiffness	Katie Smith	18:00-18:15
				485	Experimental measurements of two elastic taut-slack mooring configurations for the multi-float M4 WEC	Samuel Draycott	18:15-18:30
							18:30-18:45
							18:45-19:00
		Arriaga/ Structural mechanics - materials, fatigue, loadings	Vincenzo Nava	410	Fatigue-life prediction methods of a dynamic power cable for a floating testing platform – a numerical approach	Daniela Benites-Munoz	17:30-17:45
				419	Beta-version Testing and Demonstration of the Design Load Case Generator: A Web-based Tool to Support IEC 62600-2 Standard Design Load Case Analyses	Vincent Neary	17:45-18:00
				490	Fatigue Life Assessment for Wave Energy Converter Mooring Lines under Realistic Wave Climates	Eguzkiñe Martinez	18:00-18:15
				501	A methodology to capture the single blade loads on a cross-flow tidal turbine flume model	Timo Bennecke	18:15-18:30
							18:30-18:45
							18:45-19:00
		Oteiza/ Grid integration, power take-off and control	Jon Lekube	207	A comparison of AC and DC collection grids for marine current energy	Christoffer Fjellstedt	17:30-17:45
				315	Power quality assessment of a wave energy converter using energy storage	Md Imran Ullah	17:45-18:00
				552	Dimensioning and optimization of multi-source offshore renewable energy parks	Anton Schaap	18:00-18:15
				308	A novel proposal of PTO direct-drive linear generator, an Azimuthal Multi-translator Switched Reluctance Machine (AMSRM): mechanical, characterization and performance tests.	Marcos Lafoz	18:15-18:30
				375	Observer-Based Fault Estimation Applied to a Point Absorber Wave Energy Converter	Guglielmo Papini	18:30-18:45
				394	Control of multiple PTOs in single OWC's air chambers	Juan Portillo	18:45-19:00
20:00-22:00	**Social programme**	**Pintxos Route**					20:00-22:00

Tuesday September 5

08:00-09:00 — **Registration** *(Main Hall)* — 08:00-09:00

09:00-10:30 — Oral presentations

Room /Track	Chairman	Paper ID	Title	Presenter	
Baroja/ Wave device development and testing	Claes Eskilsson	138	Analysis of Mutriku's OWC performance	Isabel Casas	09:00-09:15
		144	Successful innovation strategies to overcome the technical challenges in the development of wave energy technologies	Pablo Ruiz-Minguela	09:15-09:30
		266	Spatial focussing of wave energy for improved power capture by an oscillating water column	Robert Mayon	09:30-09:45
		352	Relevance of Robustness and Uncertainties Analysis in the Optimal Design of Wave Energy Converters	Filippo Giorcelli	09:45-10:00
		176	Tuning Wave Energy Converters to local wave conditions	Wilson Guachamin-Acero	10:00-10:15
		466	Enabling the Ocean Internet of Things with Renewable Marine Energy	Mathew Topper	10:15-10:30
Laboa/ Tidal device development and testing	Stephanie Ordoñez-Sanchez	166	Intracycle Active Blade Pitch Control for Cross-Flow Tidal Turbines Using Embedded Electric Drive Systems	Zhao Zhao	09:00-09:15
		209	Numerical optimisation of the active lift turbines using OpenFoam's overset method	Ilan Robin	09:15-09:30
		231	Non-dimensional scaling of passive adaptive blades for a marine current turbine	Katherine Van Ness	09:30-09:45
		264	Optimal Design of a Submerged Tidal Device for Low Current Environment	Chul-hee Jo	09:45-10:00
		343	Designing Vortex Generators for Tidal Turbine Blades	Marinos Manolesos	10:00-10:15
		617	Leveraging Explainable Artificial Intelligence for Real-time Detection of Tidal Blade Damage	Muslim Jameel Syed	10:15-10:30
Arriaga/ Wave hydrodynamic modelling	Gareth Tomas	317	Verification and validation of MoodyMarine - A free simulation tool for modelling moored MRE devices	Johannes Palm	09:00-09:15
		321	A hybrid linear potential flow - machine learning model for enhanced prediction of WEC performance	Claes Eskilsson	09:15-09:30
		476	Design Wave analysis of the MK wave energy converter device	Cristine Lynggard Hansen	09:30-09:45
		497	Hydrodynamic studies of a 15 MW semi-submersible FOWT to assess the suitability of the inclusion of a damper system	Yu Gao	09:45-10:00
		145	On the state-of-the-art of CFD simulations for wave energy converters within the open-source numerical framework of DualSPHysics	Alejandro Crespo	10:00-10:15
		158	A Study on Wave Energy Conversion Problem of Turbine-integrated OWC Chamber	Jeong-Seok Kim	10:15-10:30
Oteiza/Tidal hydrodynamic modelling	Tim O'Doherty	503	Large-eddy simulations of interaction between surface waves and a tidal turbine wake in a turbulent channel	Tim Stallard	09:00-09:15
		195	Actuator-Line CFD Simulation of Tidal-Stream Turbines in a Compact Array	David Apsley	09:15-09:30
		218	High-fidelity modeling of a vertical axis tidal turbine model under realistic flow conditions	Mikaël Grondeau	09:30-09:45
		307	Synthetic eddy generation and modelling of turbine operation in a turbulent tidal flow	Matteo Gregori	09:45-10:00
		334	Impact of lateral turbine spacing on the performance of a multi-rotor tidal energy device	Rachael Smith	10:00-10:15
		367	A study on tidal rotors under the combined effects of currents and waves using actuator-line CFD simulations	Federico Zilic de Arcos	10:15-10:30

10:30-11:00 — **Refreshments, networking & posters exhibition** *(Terrace and Chillida room)* — 10:30-11:00

11:00-12:30 — Oral presentations

Room /Track	Chairman	Paper ID	Title	Presenter	
Baroja/ Wave device development and testing	Diego Vicinanza	167	Experimental evaluation of phase and velocity control for a cycloidal wave energy converter	Andrei Ermakov	11:00-11:15
		169	Wave Energy Power Take-off Validation with a Hydraulicly Actuated Rotary Dynamometer and a Bi-directional High-power DC Supply: Methods for validating wave energy converters' mechanical and electrical power conversion systems	Casey Nichols	11:15-11:30
		212	A Removable elevated-hinge wave generator for testing marine energy devices	Pedro Lomonaco	11:30-11:45
		293	Wave energy converter power take-off characterization: comparing dynamometer and field data	Curtis Rusch	11:45-12:00
		448	Limiting the available pneumatic power in a U-OWC	Joao Henriques	12:00-12:15
		499	HARGYM: Two Rapid Prototyping Environments for Wave Energy Control	Alexandra Price	12:15-12:30
Laboa/ Tidal device development and testing	Alberto Peña	285	A methodology for developing a prediction model for the remaining fatigue life and residual strength of tidal turbine blades	Tenis Ranjan Munaweera Thanthirige	11:00-11:15
		177	Multi-Actuator Full-Scale Fatigue Test of a Tidal Blade	Sergio Lopez Dubon	11:15-11:30
		203	Experimental techniques for evaluating the performance of high-blockage cross-flow turbine arrays	Aidan Hunt	11:30-11:45
		277	Observations from structural testing of full-scale tidal turbine blades	William Finnegan	11:45-12:00
		322	Experimental flow conditions effects on a bottom-mounted ducted twin vertical axis tidal turbine compared to real sea conditions	Martin Moreau	12:00-12:15
		498	Experimental comparison of the flow-induced loading between a ducted bottom-mounted twin vertical axis tidal turbine at still and an unducted prototype	Saouli	12:15-12:30
Arriaga/ Wave hydrodynamic modelling	Markel Peñalba	496	Dynamic Simulation of Wave Point Absorbers Connected to a Central Floating Platform	Thiago Saksanian Hallak	11:00-11:15
		628	Hydrodynamic and Static Stability Analysis of a Hybrid Offshore Wind-Wave Energy Generation: An Expansion of Semisubmersible Floating Wind Turbine Concept	Payam Aboutalebi	11:15-11:30
		626	Study with Large Eddy Simulations of energy dissipation due to backwash flows in wave overtopping	Claudio Sandoval	11:30-11:45
		383	Nonlinear WEC modeling using Sparse Identification of Nonlinear Dynamics (SINDy)	Brittany Lydon	11:45-12:00
		392	Numerical and Experimental Characterization of Rotational Floating Body Drag	Bryson Robertson	12:00-12:15
		460	A development and validation of the in-house hydrodynamics code and the DNV software for TALOS wave energy converter	Wanan Sheng	12:15-12:30
Oteiza/Tidal hydrodynamic modelling	Gustavo Esteban	416	A turbines-module adapted to the marine site for tidal farms layout optimization	Mikel Pucci	11:00-11:15
		442	High-fidelity modelling of a six-turbine tidal array in the Shetlands	Pablo Ouro	11:15-11:30
		454	Instabilities in tidal turbine wakes	Amanda Smyth	11:30-11:45
		505	On the accuracy of BEMT and CFD on the power and trust prediction of tidal turbines	Yabin Liu	11:45-12:00
		506	The performance of counter-rotating tidal turbine in different sea states	Song Fu	12:00-12:15
		544	Comparison of Actuator Line Modelling of Tidal Power Kites with ADCP Measurements	Nomal Prabahar	12:15-12:30

12:30-14:00 — **Lunch & posters exhibition** *(Terrace and Chillida room)* — 12:30-14:00

14:00-15:30 — Oral presentations

Room /Track	Chairman	Paper ID	Title	Presenter	
Baroja/ Wave device development and testing	Yago Torre-Enciso	242	Experimental Investigation into the Air Compressibility Scaling Effect on OWC Performance and Wave Height	André F.L. Governo	14:00-14:15
		185	Enhancing the efficiency of an axial impulse turbine with a diffuser	Geetam Saha	14:15-14:30
		260	Numerical performance assessment of a new wave energy conversion system	André F. L. Governo	14:30-14:45
		522	Basin testing of the 1-2-1 M4 WEC	Damon Howe	14:45-15:00
		451	Experimental Investigation on Performance of Counter-rotating Impulse Turbine with Middle Vanes for Wave Energy Conversion	Kichiro Suto	15:00-15:15
		268	Design of an integrated generator and heaving buoy	Nick Baker	15:15-15:30
Laboa/ Tidal device development and testing	Daniel Coles	343	Designing Vortex Generators for Tidal Turbine Blades	Marinos Manolesos	14:00-14:15
		366	A two-scale blockage correction for an array of tidal turbines	Daniel Dehtyriov	14:15-14:30
		365	Performance Assessment of a Multi-Rotor Floating Tidal Energy System	Nicholas Kaufmann	14:30-14:45
		391	The Influence of the Downstream Blade Sweep on Cross-flow Turbine Performance	Abigale Snortland	14:45-15:00
		420	Additive Manufacturing for Powering the Blue Economy Applications: A Tidal Turbine Blade Case Study	Miguel Gonzalez-Montijo	15:00-15:15
		504	Design and Demonstration of a Passive Pitch System for Tidal Turbines	Stefano Gambuzza	15:15-15:30
Arriaga/ Wave hydrodynamic modelling	Sara Russo	164	Wave Amplification Inside an Open Circular Caisson for Wave Energy Conversion in Waters with Medium Energy Density	Jiahn-Horng Chen	14:00-14:15
		513	System Identification for Modelling M4 Wave Energy Converter	Xuefei Wang	14:15-14:30
		198	Semi-analytical and CFD formulations of a spherical floater	Spyridon Mavrakos	14:30-14:45
		278	Spectral-Domain Modelling of Wave Energy Converters as an Efficient Tool for Adjustment of PTO Model Parameters	Adam Keester	14:45-15:00
		333	A multiquery analysis of a PeWEC farm	Jian Tan	15:00-15:15
		538	Effects of control strategies on the performance of floating WEC point absorbers operating attached to a breakwater by time-domain	Markos Bonovas	15:15-15:30
Oteiza/Tidal hydrodynamic modelling	AbuBakr Bahaj	579	Experimental characterisation of the wake of a bottom-mounted two tandem of cylinders placed in a high velocity area	Alina Santa Cruz	14:00-14:15
		676	Development of a modified BEMT model for the analysis of helical bladed vertical axis tidal turbines	Mohammad Fereidoonnezhad	14:15-14:30
		199	A comparative study of power production using a generic empirical model in a tidal farm	Kabir Bashir Shariff	14:30-14:45
		252	Objective Functions for the Blade Shape Optimisation of a Cross-Flow Tidal Turbine under Constraints	Karla Ruiz-Hussmann	14:45-15:00
		283	Investigating the impact of multi-rotor structure shadowing on tidal stream turbine performance	Bryn Townley	15:00-15:15
					15:15-15:30

15:30-16:00 — **Refreshments, networking & posters exhibition** *(Terrace and Chillida room)* — 15:30-16:00

16:00-17:30 — Side events

Mitxelena/Side event 4	**SafeWAVE project (by AZTI / WavEC)**	16:00-17:30
Baroja/Side event 5	**Technology Performance Level Assessment (TPL) (by SANDIA LAB. -TPL TEAM-)**	16:00-17:30
Arriaga/Side event 6	**NEMMO Project, On the Cutting Edge of Tidal Blade Design and Materials (by Ocean Energy Europe)**	16:00-17:30

17:30-19:00 — Oral presentations

Room /Track	Chairman	Paper ID	Title	Presenter	
Baroja/ Wave device development and testing	Luis Gato	318	A Novel Hybrid Floating Breakwater- Wave Energy Converter Device: Preliminary Experimental Investigations	Sara Russo	17:30-17:45
		329	Origami-adapted clam design for wave energy conversion	Jingyi Yang	17:45-18:00
		555	The Geometrical Design of the L-shaped Oscillating Water Column Using Artificial Neural Network	Chen-Chou Lin	18:00-18:15
		274	Maximizing the surge amplitude of a floater through an adaptable mooring tightening technique	Andreas Asikkis	18:15-18:30
		516	Reliability and Cost Assessment of Critical Components: Electrical generator failure of IDOM wave energy converter	Julia Fernandez Chozas	18:30-18:45
		286	Heterogeneous WEC array optimization using the Hidden Genes Genetic Algorithm	Habeebullah Abdulkadir	18:45-19:00
Arriaga/ Wave hydrodynamic modelling	Jesús M. Blanco	355	Numerical investigation of a new hybrid floating wind turbine concept	Beatrice Fenu	17:30-17:45
		376	Quantification of uncertainty in linear wave energy hydrodynamic models from experimental data	Mahdiyeh Farajvand	17:45-18:00
		379	An overview of an experimental campaign for arrays of wave energy conversion systems	Nicolas Faedo	18:00-18:15
		426	Solution verification of WECs: comparison of methods to estimate numerical uncertainties in the OES wave energy modelling task	Claes Eskilsson	18:15-18:30
		473	HydroChrono: An Open-Source Hydrodynamics Package for Project Chrono	David Ogden	18:30-18:45
		474	Nonlinear hydrodynamics of a heaving sphere in diffraction, radiation, and combined tests	Jana Orszaghova	18:45-19:00
Oteiza/ Tidal hydrodynamic modelling	Pablo Ruiz-Minguela	407	Modelling the effects of boundary proximity on a tidal rotor using the actuator line method	Huw Edwards	17:30-17:45
		464	Characterisation of turbulent flow and the wake of a tidal stream turbine in proximity to a ridge	Sulaiman Hurubi	17:45-18:00
		566	Tidal turbulence in medium depth water, primarily a model study	Göran Broström	18:00-18:15
		316	Verification and validation of blade-resolved viscous-flow tidal turbine simulations	Manuel Rentschler	18:15-18:30
		544	Comparison of Actuator Line Modelling of Tidal Power Kites with ADCP Measurements	Nomal Prabahar	18:30-18:45
					18:45-19:00

19:00-20:00 — Technical programme — Elhuyar — **Technical Committee meeting** — 19:00-20:00

20:00-22:00 — Social programme — **Track Directors Dinner** — 20:00-22:00

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Wednesday September 6

08:00-09:00					**Registration** *(Main Hall)*		08:00-09:00
09:00-10:30	Oral presentations	Room /Track	Chairman	Paper ID	Title	Presenter	
		Baroja/ Wave device development and testing	Martyn Hann	291	Simulations of extreme wave load on an oscillating water column wave energy converter	Nhu Nguyen	09:00-09:15
				298	On the survivability of WECs through submergence and passive controllers	Elie Al Shami	09:15-09:30
				393	A probabilistic framework for fatigue damage of lift based wave energy converters	Abel Arredondo-Galeana	09:30-09:45
				382	Preliminary design of an OWC wave energy converter battery charger	D.N. Ferreira	09:45-10:00
				540	Development & performance enhancement of an AUV wave-charging system	Brian Rosenberg	10:00-10:15
				550	A methodology to measure the energy flux captured by a submerged U-OWC by using temperature sensors	Luana Gurnari	10:15-10:30
		Laboa/ Tidal device development and testing	Gustavo Esteban	137	CFD analysis of hydrodynamic force on a horizontal axis tidal turbine	Kai Xu	09:00-09:15
				150	Dynamic Responses of a 1:5-Scale Ocean Current Energy Converter	Shun-Han Yang	09:15-09:30
				328	The Development of a passive blade-pitch mechanism to reduce the loads on a tidal turbine in high-flow conditions	Thomas Summers	09:30-09:45
				348	Effects of non-isotropic blockage on a tidal turbine modeled with the Actuator-Line method	Enzo Mascrier	09:45-10:00
				400	Intracycle Control Sensitivity of Cross-Flow Turbines	Ari Athair	10:00-10:15
				402	Development of an Unmanned Mobile Current Turbine Platform	Manhar Dhanak	10:15-10:30
		Arriaga/ Tidal resource characterization	Cameron Johnstone	258	Validation of the energy resource assessment with experimental data for the site selection of a tidal turbine in the Tagus River estuary.	Bénédicte Hoofd	09:00-09:15
				302	On tidal array layout sensitivity to regional and device model representation	Connor Jordan	09:15-09:30
				457	Resource assessment using a combination of seabed mounted and semi-stationary vessel-mounted ADCP measurements	Larissa Perez	09:30-09:45
				228	Measurements of tidal flow variability in Ramsey Sound, Pembrokeshire	Jon Miles	09:45-10:00
				171	Investigation of Low Order Parameters Affecting Tidal Stream Energy Resource Assessments	Misha Patel	10:00-10:15
				178	Mapping the Unresolved Tidal Resource in Estuaries	Matt Lewis	10:15-10:30
		Oteiza/ Environemental impact and appraisal	Juan Bald	187	Acoustic Characterization around the CalWave Wave Energy Converter	Kaustubha Raghukumar	09:00-09:15
				214	A conditional probabilistic encounter-impact model for fish-turbine interactions	Jezella Peraza	09:15-09:30
				220	Siting tidal energy projects through resource characterization and environmental considerations	Andrea Copping	09:30-09:45
				623	Automated detection of wildlife in proximity to marine renewable energy infrastructure using machine learning of underwater imagery	Mckenzie Love	09:45-10:00
				221	Choose Your Own Marine Energy Adventure Game: Collision Risk	Lenaig Hemery	10:00-10:15
				284	Measurements of the wake from a floating tidal energy platform	Maricarmen Guerra Paris	10:15-10:30
10:30-11:00					**Refreshments, networking & posters exhibition** ***(Terrace and Chillida room)***		10:30-11:00
11:00-12:30	Oral presentations	Room /Track	Chairman	Paper ID	Title	Presenter	
		Baroja/ Wave device development and testing	Jochen Weber	270	Biofilm prevention in the generator of a direct drive wave energy converter	Nick Baker	11:00-11:15
				330	Hydro-elastic interaction of polymer materials with regular waves	Krishnendu Puzhukkil	11:15-11:30
				380	Degrees of Freedom Effects on a Laboratory Scale WEC Point Absorber	Courtney Beringer	11:30-11:45
				155	Effects of projected wave climate changes on the sizing and performance of OWCs: a focus on the Mediterranean and Atlantic European coastal waters	Irene Simonetti	11:45-12:00
				211	A multi-PTO Wave Energy Converter for Low Energetic Seas: Ensenada Bay Case.	Paulino Meneses Gonzalez	12:00-12:15
				216	Graphene oxide reinforced room-temperature-vulcanising elastomers for flexible wave energy converters	Xinyu Wang	12:15-12:30
		Laboa/ Tidal device development and testing	Iñigo Bidaguren	418	Design, Manufacture and Testing of an Open-Source Benchmark Composite Hydrokinetic Turbine Blade	Miguel Gonzale-Montijo	11:00-11:15
				456	Wake characterization of tidal turbines in the Pentland Firth using vessel-mounted ADCP measurements	Marion Huchet	11:15-11:30
				553	Tidal Turbine Benchmarking Project: Stage I - Steady Flow Experiments	S.W. Tucker Harvey	11:30-11:45
				574	Tidal Turbine Benchmarking Project: Stage I - Steady Flow Blind Predictions	R.H.J. Wilden	11:45-12:00
				567	On the design of a small scale tidal converter for long time deployment at sea	Damiano Alizzio	12:00-12:15
							12:15-12:30
		Arriaga/ Tidal resource characterization	Vincenzo Nava	323	Influence of the spatial variation of upstream velocity on a vertical-axis tidal turbine performance	Lilia Flores Mateo	11:00-11:15
				339	Tracking a large vortex at a tidal power site	Philippe Mercier	11:15-11:30
				577	Overview of Resource and Turbine Modelling in the Tidal Stream Industry Energiser project: TIGER	Edward MacKay	11:30-11:45
				165	Evaluating the performance of turbulence closure models for tidal stream resource characterization	Zhaoqing Yang	11:45-12:00
				296	Tidal turbine wake characterization by vessel-mounted ADCP data analysis	Patxi Garcia Novo	12:00-12:15
				299	Estimation and characterisation of the wave-induced turbulent kinetic energy and turbulent dissipation from ADCP data	Clément Calvino	12:15-12:30
12:30-14:00					**Lunch & posters exhibition** ***(Terrace and Chillida room)***		12:30-14:00
14:00-15:30	Oral presentations	Room /Track	Chairman	Paper ID	Title	Presenter	
		Baroja/ Wave device development and testing	Iñigo Albaina	263	A Dual Hardware-In-the-Loop (DHIL) platform for testing and validation of WEC subsystems	Giacomo Alessandri	14:00-14:15
				430	Hardware-in-the-loop testing framework for active accumulator wave energy converters	Chen Zeng	14:15-14:30
				354	Multi wave absorber platform design, modelling and testing : Investigating the integration of multiple wave energy absorbers into a floating offshore wind platform considering a future	Nial McLean	14:30-14:45
				481	Analysis of data from the full-scale prototype testing of the WASP – A novel wave measuring buoy.	Brendan Walsh	14:45-15:00
				484	Open Sea Trial of a Wave-Energy Converter at Tuticorin Port – Challenges	Abdus Samad	15:00-15:15
				576	Test rig for submerged transmissions in wave energy converters as a development tool for dynamic sealing systems	Anthon Jonsson	15:15-15:30
		Arriaga/ Tidal resource characterization	Luke Blunden	390	Turbine fatigue load prediction from field measurements of waves and turbulence	Hannah Mullings	14:00-14:15
				428	Development of a Tool to Optimise Tidal Stream Energy Sites	Paul Evans	14:15-14:30
				432	Principles of ADCP deployment methodologies	Penny Jeffcoate	14:30-14:45
				467	Assessing wave-turbulence separation from ADCP measurements with artifical flow data	Michael Togneri	14:45-15:00
				478	Multi-criteria analysis to evaluate tidal energy potential in France	Florian Castillo	15:00-15:15
				563	Improved Modelling of Vertical Velocity Profiles at a Tidal Energy Site	Lilli Enders	15:15-15:30
		Oteiza/ Environemental impact and appraisal	Andrea Copping	303	SafeWAVE The contribution of the SafeWAVE EU project to the future development of ocean energy	Juan Bald	14:00-14:15
				326	ITSASDRONE, an autonomous marine surface drone for fish monitoring around wave energy c	Ainhize Uriarte	14:15-14:30
				600	Empowering communities to participate in marine energy planning and development	Grace Chang	14:30-14:45
				374	Assessing the effect of onshore and offshore Wave Energy Converters on seafloor integrity co	Iñigo Muxika	14:45-15:00
				554	Effects of the spacing between two hydrokinetic turbines on the bedforms by numerical simulat	Fatima Khaled	15:00-15:15
				675	Underwater noise impact assessment of a wave energy converter in the northern Atlantic (Spa	José Antonio García	15:15-15:30
15:30-16:00					**Refreshments, networking & posters exhibition** ***(Terrace and Chillida room)***		15:30-16:00
16:00-17:30	Side events	Mitxelena/Side event 7			**"SUPPORTING THE FUTURE OF OCEAN ENERGY HERE AND NOW; A GLIMPSE OF BASQUE PUBLIC INITIATIVES TO FOSTER SECTOR SCALE-UP" (by EVE)**		16:00-17:30
16:00-17:30		Baroja/Side event 8			**Wave Energy Converter Simulator (WEC-Sim) (by SANDIA LAB. -WEC-SIM TEAM-)**		16:00-17:30
		Arriaga/Side event 9			**"Instrumentation Instrumentation for Environmental Monitoring around Marine Energy Devices" (by Coastal Science Division-PNNL and WavEC)**		16:00-17:30
20:00-22:00	Social programme				**Gala Dinner (Atrium of the Guggenheim Museum)**		20:00-22:00

15th EWTEC 2023 | BILBAO
European Wave and Tidal Energy Conference Series | 3rd -7th SEPTEMBER 2023

Thursday September 7

08:00-09:00 — **Registration** *(Main Hall)* — **08:00-09:00**

	Room /Track	Chairman	Paper ID	Title	Presenter	
Oral presentations	Laboa/ Grid integration, power take-off and control	Joao Henriques	472	A time domain approach for the optimal control of wave energy converter arrays	Mohamed Shabara	09:00-09:15
			493	Optimisation of Air turbines for OWC Wave Energy Converters: Sensitivity of Realistic Wave Climates	Ander Zarketa-Astigarraga	09:15-09:30
			500	Integrated hydrodynamic-electrical hardware model for wave energy conversion with M4 ocean demonstrator	Judith Apsley	09:30-09:45
			409	On data-based control-oriented modelling applications in wave energy systems	Edoardo Pasta	09:45-10:00
			592	The Performance evaluation of 30kW class OWC wave power plant integrated with breakwater	Kilwom Kim	10:00-10:15
			161	Investigation on the extreme peak mooring force distribution of a point absorber wave energy converter with and without a survivability control system	Zahra Shahroozi	10:15-10:30
	Arriaga/ Wave resource characterization	Pasquale Contestabile	140	Analysis of the North Atlantic offshore energy flux from different reanalysis and hindcasts	Matias Alday	09:00-09:15
			175	Wave Spectral Analysis for designing Wave Energy Converters	Jesus Portilla-Yandun	09:15-09:30
09:00-10:30			275	Long term wave load trends against offshore monopile structures: A case study in the Bay of Biscay	Nahia Martinez-Iturricastillo	09:30-09:45
			279	Numerical modelling of wave and tidal current interactions and their impact on wave parameters	Tian Tan	09:45-10:00
			205	On the errors in annual energy yield estimation due to monodirectional wave spectra assumption	Giulia Cervelli	10:00-10:15
			305	Validation of ERA5 Wave Energy Flux through Sailor diagram in Spain (2005-2014)	Jon Saenz	10:15-10:30
	Oteiza/ Economical, social, legal and political aspects of ocean energy	Pablo Ruiz-Minguela	154	Do recent renewable energy policy changes in Ireland satisfy the requirements of a nascent wave energy technology development sector?	Carrie Anne Barry	09:00-09:15
			157	Integration of wave energy into Energy Systems: an insight to the system dynamics and ways foward	George Lavidas	09:15-09:30
			306	Can Risk-Based Approaches benefit future Marine Renewable Energy deployment, planning and consenting processes?	Emma Verling	09:30-09:45
			351	Towards increased social acceptability of marine renewable energy	Niall P. Dunphy	09:45-10:00
			362	Environmental Effects of MRE: Advancing the Industry through Broad Outreach and Engagement	Mikaela Freeman	10:00-10:15
			397	Informing development of a socioeconomic data collection toolkit for marine energy: a literature review	Deborah Rose	10:15-10:30

10:30-11:00 — **Refreshments, networking & posters exhibition** *(Terrace and Chillida room)* — **10:30-11:00**

	Room /Track	Chairman	Paper ID	Title	Presenter	
Oral presentations	Baroja/ Wave device development and testing	Urko Izquierdo	453	The Impact of Uncertainty on the Control of a Multi-Axis Wave Energy Converter	Carrie Hall	11:00-11:15
			531	Spectral control co-design of wave energy converter array layout	Yerai Peña-Sanchez	11:15-11:30
			548	A new seawater low-head turbine for the OBREC	Pasquale Contestabile	11:30-11:45
			549	Experimental investigation on the hydrodynamic performance of a pile-supported OWC-type breakwater	Yusuf Almalki	11:45-12:00
			661	Weight Reduction Methodologies for Wave Energy Devices: A Structural Analysis Approach	Michael O'Shea	12:00-12:15
						12:15-12:30
	Laboa/ Grid integration, power take-off and control	Eider Robles	215	Wave Farms Integration in a 100% renewable isolated small power system -frequency stability and grid compliance analysis.	Marcos Blanco	11:00-11:15
			309	Wave-to-Wire Control of an Oscillating Water Column Wave Energy System Equipped with a Wells Turbine	Marco Rosati	11:15-11:30
			510	Maximizing Wave Energy Converter Power Extraction by Utilizing a Variable Negative Stiffness Magnetic Spring	Jeff T. Grasberger	11:30-11:45
			561	Development of control strategies for novel systems of a full scale OWC for the WEDUSEA project	James Kelly	11:45-12:00
			346	Enhancing energy system resilience using tidal stream energy	Danny Coles	12:00-12:15
11:00-12:30			551	Analysis of Ocean Energy Integration in Ibero-American Electric Grids	Marcos Lafoz	12:15-12:30
	Arriaga/ Wave resource characterization	Jesús M. Blanco	529	Impact of Resource Uncertainties on the Design of Wave Energy Converters	Markel Peñalba	11:00-11:15
			539	Discussions on Wave energy period in higher wave energy potential marine waters of Taiwan	Shiaw-Yih Tang	11:15-11:30
			159	Internal waves: A potentially untapped marine energy resource	Kastubha Raghukumar	11:30-11:45
			197	Feasibility of wave energy harvesting in the Ligurian Sea	Manuel Alejandro Corrales-González	11:45-12:00
			378	Identification of optimal sites for the deployment of wave energy converters: the importance of a technology-centred approach	Riccardo Novo	12:00-12:15
			558	Operating and Extreme weather conditions for testing Offshore Devices at Marine Renewable Energy Lab (MaRELab)	Pasquale Contestabile	12:15-12:30
	Oteiza/ Economical, social, legal and political aspects of ocean energy	Peter Frigaard	398	Techno-economic analysis of marine hybrid clusters in two potential Latin American markets	Emilian Gorr-Pozzi	11:00-11:15
			399	Techno-economic optimization of an offshore hybrid power system: Argentine Basin case study	Sarah Palmer	11:15-11:30
			452	Ensuring Resilience in Ocean Energy Power Plants: A Survey of Cybersecurity Measures	Thalita Nazare	11:30-11:45
			340	On the complementarity of wave, tidal, wind and solar resources in Ireland	Hafiz Ashan Said	11:45-12:00
			335	A Comparison of the European Regulatory Framework for the deployment of Wave Energy Converters	Claudio Moscoloni	12:00-12:15
						12:15-12:30

12:30-14:00 — **Lunch & posters exhibition** *(Terrace and Chillida room)* — **12:30-14:00**

	Room /Track	Chairman	Paper ID	Title	Presenter	
Oral presentations	Baroja/ Wave device development and testing	Tony Lewis	350	Performance enhancement of pitching WECs via oscillating water columns technology	Marco Fontana	14:00-14:15
			357	Numerical investigation of the energy performance of a wave energy converter comprising a multi-body power take-off	Félix Elefant	14:15-14:30
			395	Hybrid wind-wave systems: The case of the VoltumUS-S semi-submersible platform	Maximilian Hengstmann	14:30-14:45
			439	Analysis of the viability of a radial Double Decker Turbine for application in Oscillating Water Column devices	Aito Vega-Valladares	14:45-15:00
			445	An Early Design Phase Method for Characterizing and Comparing Wave Energy Converter Archetypes	Aeron Roach	15:00-15:15
						15:15-15:30
	Arriaga/ Wave resource characterization	Jose L. Villate	564	Upsampling wave temporal resolution: Investigating wave parameters and the influence on WEC power performance	Hannah Mankle	14:00-14:15
			619	On spatial interpolation of ocean energy source variables: A comparative analysis	Leonardo Gambarelli	14:15-14:30
14:00-15:30			584	Numerical Study on Overtopping Performance of Multi-stage Overtopping Wave Energy Converters	Guoliang Zhang	14:30-14:45
			475	The application of temporal gating in the measurement of response amplitude operators	Ben Cazzolato	14:45-15:00
			310	Analysis of the impact of floater interactions on the power extraction of a dense WEC array with adaptable nonlinear PTO	Alva Bechlenberg	15:00-15:15
			483	New design options for the improvement of the Mutriku power plant	Urko Izquierdo	15:15-15:30
	Oteiza/ Economical, social, legal and political aspects of ocean energy	James Benhin	507	Ocean Energy: Markets – Currency – Impact. Dimension of & Choices in the Technology Development Space	Jochem Weber	14:00-14:15
			223	Using human-centered design to develop a national research landscape for marine energy in the United States	Samantha Quinn	14:15-14:30
			385	Choosing Wave Energy Devices for Community Led Marine Energy Development	Molly Grear	14:30-14:45
			388	A Socioeconomic, Environmental, and Regulatory Assessment for Current Energy Converter Technologies	Dominic Forbush	14:45-15:00
			413	Floating wind and wave energy technologies: applications, synergies and role in decarbonization in Portugal	Craig White	15:00-15:15
			436	Wave energy communication and social opposition: can we improve perception of ocean energy development projects?	Maria C. Uyarra	15:15-15:30

15:40-16:15	Closing ceremony	Mitxelena Auditorium	Jesús M. Blanco	Local Committee	15:40-15:45
			Jose L. Villate	Local Committee	15:45-15:50
			Iñigo Ansola	Chair EVE	15:50-15:55
			Bruce Cameron	Chair PAMEC 2024	15:55-16:00
			C H Jo	Chair AWTEC 2024	16:00-16:05
			Cameron Johnstone	EWTEC Executive Board	16:05-16:10
			Luis Gato	IST Lisbon (Chair of EWTEC'25)	16:10-16:15

16:30-20:30	Social programme	**Technical visits:** **Option 1: MUTRIKU** **Option 2: BIMEP**	16:30-20:30
21:00-22:30	Technical programme	**(Executive Board Meeting and Dinner)**	21:00-22:30

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European Wave and Tidal Energy Conference Series
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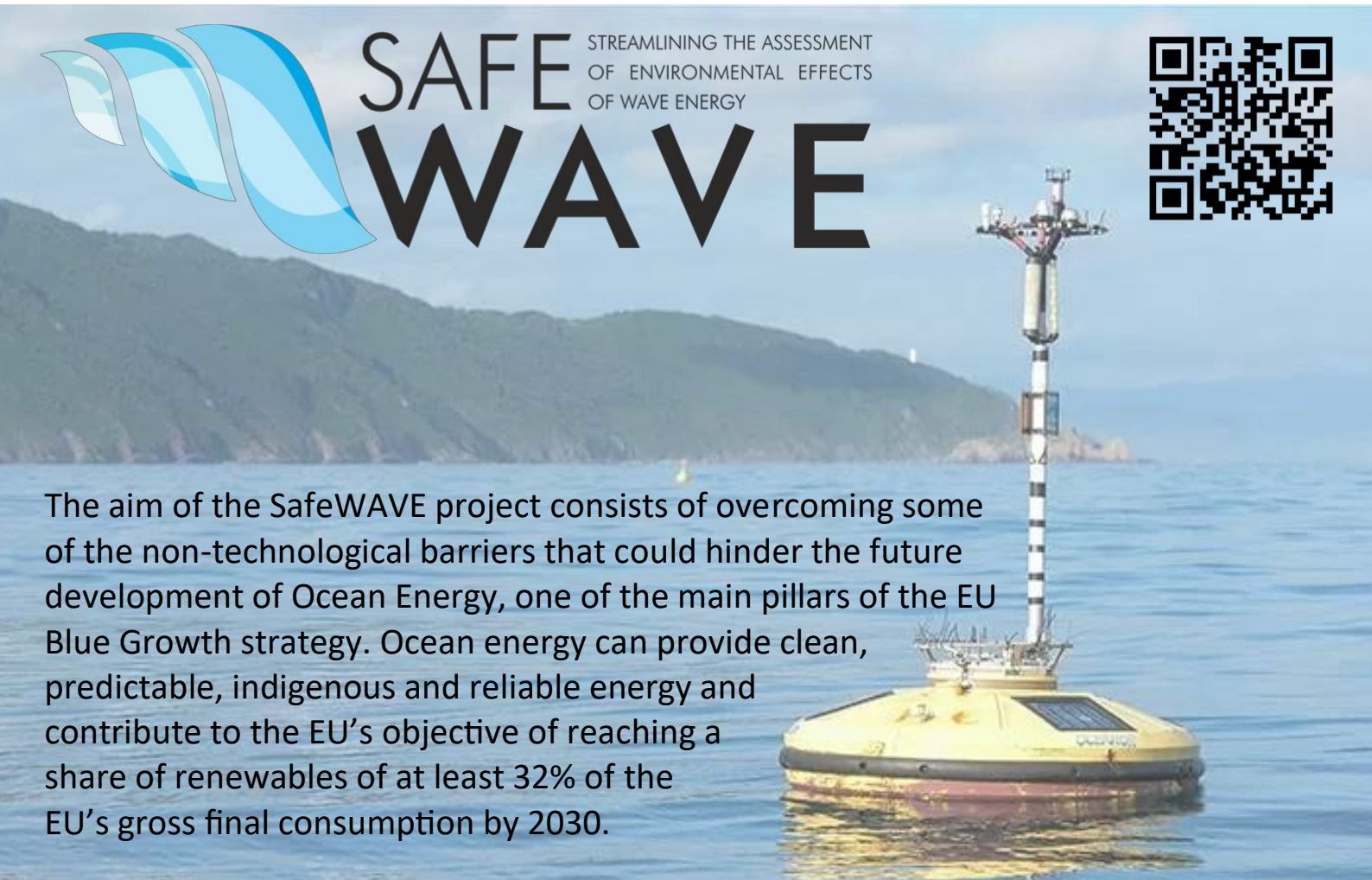
Paper ID	Title of the poster	Authors' List
342	Vortex induced vibrations of marine risers: validating turbulence models	Chang, Wang; Antonis Vakis; Arthur Veldman; Eize, Stamhuis
313	Grid value of co-located offshore renewable energy	Erik, Jonasson; Irina, Temiz
545	Preliminary performance assessment from towing tank testing of a horizontal-axis turbine	David, Lande-Sudall; Sondre, Tolleifsen; Kjetil, Gravelsæter; Harald, Moen; Jan Bartl
377	Life Cycle Assessment of a wave energy device – LiftWEC	Paula, Bastos; Fiona, Devoy-McAuliffe; Abdel, Arredondo-Galeana; Julia Chozas; Paul, Lamont-Kane; Pedro, Almeida Vinagre
184	Experimental passive and reactive control of a Laboratory Scale WEC Point Absorber	Bret, Bosma; Courtney, Beringer; Bryson, Robertson;
586	Combining offshore wind and wave energy to supply a big size desalination plant	Beatriz, Del Rio Gamero; Julieta, Schallenberg Rodríguez; Pedro, Suarez Arocha
422	Design, installation, capacities and expenses of an indoor multipurpose modular 2D wafe flume and circulating water channel	Iñigo, Bidaguren; Natalia, Montalban; Urko, Izquierdo; Iñigo, Albaina; Alberto, Peña; Egoitz, Urtaran; Jesus Maria, Blanco;
578	Experimental Optimization Environment for Developing an Intracycle Pitch Control in Cross Flow Turbines	Stefan, Hoerner; Roberto, Leidhold; Shokoofeh, Abbaszadeh; Karla, Ruiz-Hussmann; Timo, Bennecke; Zhao, Zhao; Christian-Tora, Weber; Pierre-Luc, Delafin;
441	Increase in power generation by calculating maximum amount of drainage water using a real-time water level prediction A.I.	HeeJin, Kwack; SungHun, Lee; ByunJoon, Jun; SangJun, Min; JeonA, Baek; SeoYeong, Lee
570	Assessment of tidal energy resources in the Strait of Magellan in southern Chile	Leandro, Suarez Atias; Cristian, Escauriaza; Megan Williams; Maricarmen, Guerra;
387	Quality Function Deployment methodology as a tool for sustainable design of ocean technologies	Selef Farcia Orozco
325	Marine Renewable Energies and Maritime Spatial Planning: different national proposals for their legal and spatial context	Iratxe Mentxaka; Ibon Galparsoro; Emma Verling; Inés Machado; Enored LebBourhis; Thomas Soulard; Juan Bald
542	A Filtering device for improving the quality of cooling water in turbine generator of Sihwa Tidal Power Plant	Taekyun Kin; Hee Jin Kwak; Jee Hun Bang; Mosol Kim; Bem sug Kim
276	A new type of wave tank: prototype and proof of concept	Joannes Berque; Iñigo Zarate; Jesus Maria Blanco; Iñigo Bidaguren; Imanol Touzon; Luisa Fernandez
488	Comparison of physics-based and machine learning methods for phase-resolved prediction of waves measured in the field	Jialun Chen; Thobani Hlophe; Wenhua Zhao; Ian A. Milne; David Gunawan; Adi Kurniawan; Hyg Wolgamot; Paul H. Taylor; Jana Orszaghova
170	Wave Excitation Tests on a Fixed Sphere: Comparison of Physical Wave Basin Setups	Jacob Andersen; Morten Bech Kramer
368	Development of the Exowave Oscillating Wave Surge Converter	Sarah Krogh Iversen; Jacob Andersen; Lars Wigant; Peter Frigaard

Notes


SAFE
STREAMLINING THE ASSESSMENT OF ENVIRONMENTAL EFFECTS OF WAVE ENERGY
WAVE
The aim of the SafeWAVE project consists of overcoming some of the non-technological barriers that could hinder the future development of Ocean Energy, one of the main pillars of the EU Blue Growth strategy. Ocean energy can provide clean, predictable, indigenous and reliable energy and contribute to the EU's objective of reaching a share of renewables of at least 32% of the EU's gross final consumption by 2030.

Notes