

| 9:00  |  |   |  | Thursday September 7  |   |
|---|--|---|--|---|---|
|   |  |   |  | Registration<br>(Main Hall)   |   |
|   | Room /Track  | Chairman  | Paper ID   | Title   | Presenter   |
|   |  | Joao Henriques  | 472  | A time domain approach for the optimal control of wave energy converter arrays<br>Optimisation of Air turbines for OWC Wave Energy Converters: Sensitivity of Realistic Wave  | Mohamed Shabara   |
|   | Laboa/   |   | 493<br>500   | Climates<br>Climates<br>Integrated hydrodynamic-electrical hardware model for wave energy conversion with M4  | Ander Zarketa-Astigarraga   |
|   | Grid integration, power<br>take-off and control  |   | 409  | ocean demonstrator<br>On data-based control-oriented modelling applications in wave energy systems  | Judith Apsley<br>Edoardo Pasta  |
| Oral<br>presentations   |  |   | 592  | The Performance evaluation of 30kW class OWC wave power plant integrated with<br>breakwater   | Kilwom Kim  |
|   |  |   | 161  | investigation on the extreme peak mooring force distribution of a point absorber wave energy<br>converter with and without a survivability control system   | Zahra Shahroozi   |
|   | Arriaga/<br>Wave resource<br>characterization  | Joannes Berque  | 140  | Analysis of the North Atlantic offshore energy flux from different reanalysis and hindcasts   | Matias Alday  |
|   |  |   | 175  | Wave Spectral Analysis for designing Wave Energy Converters<br>Long term wave load trends against offshore monopile structures: A case study in the Bay of  | Jesus Portilla-Yandun<br>Nahia Martinez-Iturricastillo  |
|   |  |   | 275<br>279   | Biscay<br>Numerical modelling of wave and tidal current interactions and their impact on wave   | Tian Tan  |
|   |  |   | 205  | parameters<br>On the errors in annual energy yield estimation due to monodirectional wave spectra<br>assumption   | Giuseppe Giorgi   |
|   |  |   | 305  | Validation of ERA5 Wave Energy Flux through Sallor diagram in Spain (2005-2014)   | Alain Ulazia  |
|   | Oteiza/<br>Economical, social, legal<br>and political aspects of<br>ocean energy   | Pablo Ruiz-Minguela   | 154  | Do recent renewable energy policy changes in Ireland satisfy the requirements of a nascent<br>wave energy technology development sector?<br>Interactions of upon perceivable Sectors?   | Carrie Anne Barry   |
|   |  |   | 157  | Integration of wave energy into Energy Systems: an insight to the system dynamics and ways<br>forward<br>Can Risk-Based Approaches benefit future Marine Renewable Energy deployment, planning  | George Lavidas<br>Emma Verling  |
|   |  |   | 306<br>351   | and consenting processes?<br>Towards increased social acceptability of marine renewable energy  | Niall P. Dunphy   |
|   |  |   | 362  | Environmental Effects of MRE: Advancing the Industry through Broad Outreach and<br>Engagement   | Deborah Rose  |
|   |  |   |  |   |   |
| -11:00  | T  |   | 1  | g & posters exhibition (Terrace and Chillida room)  |   |
|   | Room /Track  | Chairman  | Paper ID<br>453  | Title   | Presenter<br>Carrie Hall  |
|   |  | Lirko izguierdo   | 453  |   | Yerai Peña-Sanchez  |
|   | Baroja/  |   | 548  | A new seawater low-head turbine for the OBREC   | Sara Russo  |
|   | Wave device development<br>and testing   | Urko Izquierdo  | 549  | Experimental investigation on the hydrodynamic performance of a pile-supported OWC-type<br>breakwater   | Yusuf Almalki   |
|   |  |   | 661  |   | Michael O'Shea  |
|   |  |   | 170  | Wave Excitation Tests on a Fixed Sphere: Comparison of Physical Wave Basin Setups<br>Wave Farms Integration in a 100% renewable isolated small power system -frequency stability  | Jacob Andersen  |
|   | Laboa/<br>Grid integration, power<br>take-off and control  | Eider Robles  | 215<br>309   | wave Farms integration in a 100% enrewable solated small power system -nequency subility<br>and grid compliance analysis.<br>Wave-to-Wire Control of an Oscillating Water Column Wave Energy System Equipped with a<br>Wells Turbine  | Marcos Blanco<br>Marco Rosati   |
|   |  |   | 309<br>510   | Maximizing Wave Energy Converter Power Extraction by Utilizing a Variable Negative  | Carlos Michelen   |
|   |  |   | 561  | Stiffness Magnetic Spring<br>Development of control strategies for novel systems of a full scale OWC for the WEDUSEA<br>project   | James Kelly   |
| :00-12:30 Oral presentations  |  |   | 346  | Enhancing energy system resilience using tidal stream energy  | Danny Coles   |
|   |  |   | 551  | Analysis of Ocean Energy Integration in Ibero-American Electric Grids   | Marcos Lafoz  |
|   | Arriaga/<br>Wave resource<br>characterization  | Jesús M. Blanco   | 529<br>539   | Impact of Resource Uncertainties on the Design of Wave Energy Converters Discussions on Wave energy period in higher wave energy potential marine waters of Taiwan  | Markel Peñalba<br>Shiaw-Yih Tzang   |
|   |  |   | 159  | Internal waves: A potentially untapped marine energy resource   | Kastubha Raghukumar   |
|   |  |   | 197  | Feasibility of wave energy harvesting in the Ligurian Sea   | Manuel Alejandro Corrales-González  |
|   |  |   | 378  | Identification of optimal sites for the deployment of wave energy converters: the importance<br>of a technology-centred approach  | Riccardo Novo   |
|   |  |   |  | Technologoania estimization of an effektory hybrid environmetery. Amentica, Bosin esse  |   |
|   | Oteiza/<br>Economical, social, legal<br>and political aspects of   | Yago Torre-Enciso   | 399  | Techno-economic optimization of an offshore hybrid power system: Argentine Basin case<br>study<br>Economic Basilinance in Oceano Economy Bayter A Suprey of Ochomocythy Moceynon  | Sarah Palmer<br>Thalita Nazare  |
|   |  |   | 452<br>340   | Ensuring Resilience in Ocean Energy Power Plants: A Survey of Cybersecurity Measures On the complementarity of wave, tidal, wind and solar resources in Ireland   | Hafiz Ashan Said  |
|   |  |   | 335  | A comparison of the European Regulatory Framework for the deployment of Wave Energy   | Hafiz Ashan Said<br>Claudio Moscoloni   |
|   | ocean energy   |   | 507  | Conventers<br>Ocean Energy: Markets – Currency – Impact. Dimension of & Choices in the Technology<br>Development Space  | Jochem Weber  |
|   |  |   | 397  | Informing development of a socioeconomic data collection toolkit for marine energy: a<br>literature review  | Deborah Rose  |
|   |  |   |  |   |   |
| -14:00  |  |   |  | .unch & posters exhibition<br>Terrace and Chillida room)  |   |
| -14:00  | Room /Track  | Chairman  |  |   | Presenter   |
| -14:00  | Room /Track  | Chairman  | (1   | Tetrace and Chillida room) Title Performance enhancement of pliching VECs via osoliating water columns technology   | Presenter<br>Marco Fontana  |
| -14:00  |  | Chairman  | (1<br>Paper ID<br>350<br>357   | Title Performance enhancement of pitching VECs via osolitating water columns technology Numerical investigation of the energy performance of a wave energy converter comprising a multibody power late-off  | Marco Fontana<br>Félix Elefant  |
| -14:00  | Baroja/<br>Wave device development   | Chairman  | (1<br>Paper ID<br>350<br>357<br>395  | Tetrace and Chillida room) Title Performance enhancement of pliching WEGs via casoliating water columns technology Numetical investigation of the energy performance of a wave energy converter comprising a multibody power take-off Hyndi wind-awve systems: The case of the VoltumUS-S semi-submersible platform   | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann   |
| -14:00  | Baroja/  |   | (1<br>Paper ID<br>350<br>357<br>395<br>439   | Title Performance enhancement of pitching VECs via osolitating water columns technology Numerical investigation of the energy performance of a wave energy converter comprising a multibody power late-off  | Marco Fontana<br>Félix Elefant  |
| 14:00   | Baroja/<br>Wave device development   |   | (1<br>Paper ID<br>350<br>357<br>395  | Tetrace and Chillida room) Title Performance enhancement of pitching WEDs via osalitating water columns technology Numerical investigation of the energy performance of a wave energy converter comprising a mati-body power tak-off Hydri wird wave systems: The case of the VoltumUS-S seni-submenable platform Analysis of the vability of a radial Double Decker Turbine for application in Oscillating Water Column devices  | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Aitor Vega-Valladares  |
| 14:00   | Baroja/<br>Wave device development   |   | (1<br>Paper ID<br>350<br>357<br>395<br>439   | Terrace and Chillida room) Title Performance enhancement of pitching VECs via occlusting water columns technology Numberly converties of the energy performance of a wave energy conventer comprising a hybrid wind wave systems. The case of the VolturuUS-5 series ubmensible platform Analysis of the valetity of a radiat Double Docker Turche for application in Ocellaring Water Concentry Conventer Anchetypes Have Bethod for Characterizing and Comparing Wave Energy Conventer Anchetypes   | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Aitor Vega-Valladares  |
|   | Baroja/<br>Wave device development<br>and testing  |   | (1<br>Paper ID<br>350<br>357<br>395<br>439<br>445<br>  | Title           Performance enhancement of pliching VMECs via oscillating water columns technology           Numerical investigation of the energy performance of a wave energy converter comprising a multi-body power tak-off.           Hybrid wind wave systems: The case of the VoltumUS-S seni-submensible platform           Analysis of the values of a mail be becker Turbine for application in Dicelliting Water Column devices           An Early Degin Phase Method for Characterizing and Comparing Wave Energy Converter Archeypes           Usampling wave temporal nebulation investigging wave parameters and the influence on the Copper performance.           Os gastal interpolation of column energy dounce variables: A comparate energies  | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Man&e<br>Leonardo Gentharelli   |
| -14:00<br>-15:30 oral<br>presentation:  | Baroja/<br>Wave device development<br>and testing<br>Arriaga/<br>Wave resource   |   | (1<br>Paper ID<br>350<br>357<br>395<br>439<br>445<br>445<br>619<br>475   | Tereace and Chillida room)  Title Performance enhancement of pitching WECs via osolitating water columns technology Numerical investigation of the energy performance of a wave energy converter comprising a millibody power late-off. Hydrid Mind wave systems: The case of the VoltumUS-3 sens-submersheb patrom Hydrid Mind wave systems: The case of the VoltumUS-3 sens-submersheb patrom Analysis of the voltub of the and Double Decker Turbine for application in Oscillating Water Column devices An Entry Design Phase Method for Charactericiting and Comparing Wave Energy Converter Archetypes Usea mpling wave inergoid resolution: Investigating wave parameters and the inhumes an Dir spatial interpolation of clean energy source valiables: A congestate analysis The spatial interpolation of clean energy source valiables: A congestate analysis   | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Mankio<br>Leonardo Gambarelli<br>Natalia Sergienko  |
| 15.20 Oral  | Baroja/<br>Wave device development<br>and testing<br>Arriaga/  | Tony Lewis  | Paper ID           350           357           395           439           445           564           619           475           310   | Tereace and Chillida room)  Title Performance enhancement of pitching WECs via osolitating water columns technology Numerical investigation of the energy performance of a wave energy converter comprising a millibody power late-off. Hydrid Mind wave systems: The case of the VoltumUS-3 sens-submersheb patrom Hydrid Mind wave systems: The case of the VoltumUS-3 sens-submersheb patrom Analysis of the voltub of the and Double Decker Turbine for application in Oscillating Water Column devices An Entry Design Phase Method for Charactericiting and Comparing Wave Energy Converter Archetypes Usea mpling wave inergoid resolution: Investigating wave parameters and the inhumes an Dir spatial interpolation of clean energy source valiables: A congestate analysis The spatial interpolation of clean energy source valiables: A congestate analysis   | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Man&e<br>Leonardo Gentharelli   |
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| I-15:30 Presentation<br>Presentation  | Baroja/<br>Wave device development<br>and testing<br>Arriaga/<br>Wave resource<br>characterization<br>Oteiza/<br>Economical, social, legal<br>and political aspects of<br>ocean energy | Tony Lewis Jose L. Villate Jose L. Villate Jochem Weber Ikigo Ansola Ikigo Ansola Ikigo Ansola Ikigo Ansola ChabuBakr Bahaj Biruce Cameron C H Jo Luis Gato | Paper ID           350           357           395           439           445           619           45           310           403           386           413           386           413           436           Chai           Chai           Chai           PFR           PRM   | Technical visits:   | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Mankie<br>Hannah Mankie<br>Leonardo Gambarelli<br>Natalia Sergienko<br>Aiva Bechlenberg<br>Urio tiquierdo<br>Samantha Quinn<br>Molly Grear<br>Jonathan Colby<br>Craig White |
| 15:30 Presentation<br>presentation<br>16:15 Closing<br>ceremony<br>20:30 Social | Baroja/<br>Wave device development<br>and testing<br>Arriaga/<br>Wave resource<br>characterization<br>Oteiza/<br>Economical, social, legal<br>and political aspects of<br>ocean energy | Tony Lewis Jose L. Villate Jose L. Villate Jochem Weber Ikigo Ansola Ikigo Ansola Ikigo Ansola Ikigo Ansola ChabuBakr Bahaj Biruce Cameron C H Jo Luis Gato | Paper ID           350           357           395           439           445           619           45           310           403           386           413           386           413           436           Chai           Chai           Chai           PFR           PRM   | Terrace and Chillida room)       Tele       Performance enhancement of thicking VECs is an exclusing water columes technology       Numerical pressing store of the energy performance of a wave energy conventer comparing a       Hybrid with wave system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water is system. The case of the Volum US-S is an exclusing water presenter and the influence oner and comparing Wave Energy Conventer.       Anamaging water is system. The case of the Volum US-S is an exclusion of or celefang Wave Energy Conventer.       The base performance.       De data is interpolation of colume energy accurace vanishies. A comparative simplifie the influence oner influence and the volum US-S is an exclusion.       The base performance.       De data is interpolation of colume energy accurace vanishies. A comparative energy Conventer.       Tables of the impolation of base interpolation of a data wave parameter and the influence oner influence and the influence and the influence oner influence and the influence oner influence oner influence and the influence oner influence and the influence oner influence and the influence oner influence oner influence oner influence and the influence oner influence and the influence oner  | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Mankie<br>Hannah Mankie<br>Leonardo Gambarelli<br>Natalia Sergienko<br>Aiva Bechlenberg<br>Urio tiquierdo<br>Samantha Quinn<br>Molly Grear<br>Jonathan Colby<br>Craig White |
| 15:30 Oral<br>presentation<br>16:15 Closing<br>ceremony                         | Baroja/<br>Wave device development<br>and testing<br>Arriaga/<br>Wave resource<br>characterization<br>Oteiza/<br>Economical, social, legal<br>and political aspects of<br>ocean energy | Tony Lewis Jose L. Villate Jose L. Villate Jochem Weber Ikigo Ansola Ikigo Ansola Ikigo Ansola Ikigo Ansola ChabuBakr Bahaj Biruce Cameron C H Jo Luis Gato | Paper ID           350           357           395           439           445           619           45           310           403           386           413           386           413           436           Chai           Chai           Chai           PFR           PRM   | Terrace and Chillida room)       Tele       Performance enhancement of thicking VECs is an exclusing water columes technology       Numerical pressing store of the energy performance of a wave energy conventer comparing a       Hybrid with wave system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water system. The case of the Volum US-S is an exclusing water columes technology.       Anamagin of the water is system. The case of the Volum US-S is an exclusing water presenter and the influence oner and comparing Wave Energy Conventer.       Anamaging water is system. The case of the Volum US-S is an exclusion of or celefang Wave Energy Conventer.       The base performance.       De data is interpolation of colume energy accurace vanishies. A comparative simplifie the influence oner influence and the volum US-S is an exclusion.       The base performance.       De data is interpolation of colume energy accurace vanishies. A comparative energy Conventer.       Tables of the impolation of base interpolation of a data wave parameter and the influence oner influence and the influence and the influence oner influence and the influence oner influence oner influence and the influence oner influence and the influence oner influence and the influence oner influence oner influence oner influence and the influence oner influence and the influence oner  | Marco Fontana<br>Félix Elefant<br>Maximilian Hengstmann<br>Altor Vega-Valladares<br>Aeron Roach<br>Hannah Mankie<br>Hannah Mankie<br>Leonardo Gambarelli<br>Natalia Sergienko<br>Aiva Bechlenberg<br>Urio tiquierdo<br>Samantha Quinn<br>Molly Grear<br>Jonathan Colby<br>Craig White |