



6-7-8 October. Bilbao Exhibition Centre. BEC.

Conference Programme

Main Sponsor



Organizers



Welcome to ICOE 2010 BILBAO

A Commitment to Rational Use of the Sea

Increasingly, governments around the world are coming to accept that tapping into marine energy can be an important way of solving the need for more environmentally-friendly energy, and can help reduce the massive consumption of fossil fuels.

Harnessing energy in the marine environment entails both advantages and disadvantages; however, any difficulties are far outweighed by the vast amount of energy contained in the sea, which can be rationally used to cover a considerable proportion of our energy needs. Nonetheless, many different groups of people use the sea and they all need to be taken into account when new energy projects are being developed. ICOE 2010 Bilbao will provide an exceptional opportunity to discuss all these topical issues and learn more about the latest advances in marine technology and devices.

This international event will be a chance to share knowledge, create networks of exchange and, in short, to drive forward this common commitment to clean, renewable energy.

Registration

If at all possible, participants are encouraged to register online. Payment by credit card is preferred.

On-site registration available from 5th to 8th October at BEC registration desks. Payment will be by credit card only.

The conference registration fee is €500, with a 10% group discount for parties of at least 5 persons.

Accreditation

Delegate accreditations for ICOE 2010 Bilbao can be picked up at the counters in the BEC at the following times:

5 October: 12:00 - 19:00

6, 7 and 8 October: 08:00 - 18:00

Cancellations and substitutions

All registrations shall be considered official and the corresponding place shall be guaranteed once payment has been made.

No refund shall be made once the booking has been made.

The holder of the reservation may transfer his/her place to another member of the same organisation, provided the organisers are notified of any change at least 48 hours before the event begins.

No alterations shall be accepted after this time.

Language

The official language of the conference is English.

Simultaneous interpretation (Spanish/English) will be available at all sessions

Technical Secretariat

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Presentation

Twenty years ago, the Basque government and its energy agency, Ente Vasco de la Energía, made a decision to bank on a form of energy development in which renewable energy sources would play a major role. The result of this decision has been the creation of a large number of renewable energy developments. Two of those currently under development involve marine energy: the Mutriku wave-power facility and the bimep in the Biscay Marine Energy Platform.

Another reflection of this commitment can be seen in the international conferences on the theme organised each year in the Basque Country, and in particular ICOE 2010, one of the most important marine energy events in the world.

And so, Bilbao is hosting the third ICOE, which will bring together different industries and audiences with a common interest in the sea and offer contributions of the highest technological and scientific standard. Bilbao will provide an ideal backdrop for delegates to enjoy this unique event.

I would like to extend my warmest welcome to all participants and hope that your stay among us will be a fruitful one.



Javier Marqués
Co-chairman of ICOE 2010 Bilbao
Ente Vasco de la Energía (EVE)

I would like to welcome you all to the third International Conference on Ocean Energy where you will be able to find out about the latest advances in ocean energy around the world. ICOE 2010, which combines three days of conference with an industrial exhibition, aims to attract world leaders from the ocean energy sector.

The conference has a strong industrial focus and will address key topics to push ocean energy onto the industrial stage, such as financing, public policies or lessons learnt from other sectors. In addition there will be specific oral and visual presentations concentrating on relevant research activities. From over 200 abstracts received from around 20 countries around the world, the ICOE Committee selected around 90 oral presentations, divided into 3 tracks and 20 sessions, and 78 visual presentations.

The first EU-OEA industrial exhibition will be held in conjunction with the ICOE2010 conference. The aim is for this exhibition to become an annual dynamic event for exchanging views on policy matters, doing business and meeting industry colleagues and experts in the field. The EU-OEA exhibition will provide a unique opportunity for leading manufacturers, utilities, developers, contractors, consultants, suppliers and service companies, financiers, universities and research institutes, NGOs and other organisations to showcase their products and services.

I look forward to seeing you at ICOE 2010 and encourage you to consider spending a few extra days to enjoy Bilbao.



José Luis Villate
Co-chairman of ICOE 2010 Bilbao
Tecnalia

The Venue

BEC!

BEC! Bilbao Exhibition Centre

1 Ronda de Azkue st
48902 Ansio - BARAKALDO

Tel : +34 94 404 00 00
Fax : +34 94 404 00 01

bec@bec.eu
www.beconvencciones.com



How to get there

There are a number of ways of getting to the BEC by public transport from the centre of Bilbao and from the airport.



Metro



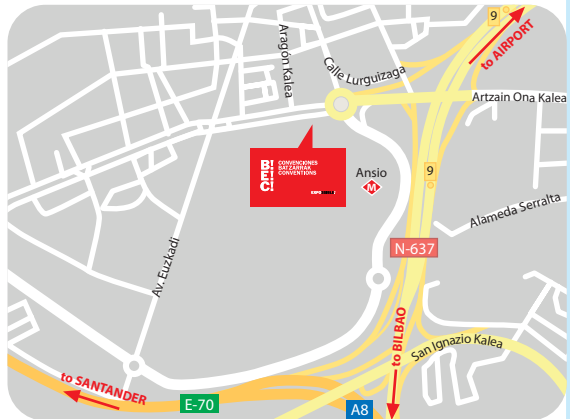
Airport
13km



Bus
Station



Close
to A-8



Public transport from Bilbao

By metro the BEC is just 15 minutes from the centre of the city.

- **Metro Bilbao** Line 2, direction Santurtzi.
The ANSIO station, next to the BEC,
is just 15 minutes from Bilbao centre.

Public transport from the airport

Bilbao international airport, **10 kilometres** outside the city centre, has direct flights to many leading European destinations. Altogether, 16 airlines offer flights from Bilbao, the main airport in the north of the Iberian Peninsula.

- **24-hour taxi service (Teletaxi: +34 944.448.888)**
- **Bizkaibus**
A3247 Airport-Bilbao.
Connection to Bilbao metro at Plaza Moyua and San Mamés.

Social Events



**Wednesday,
6 October**

20:00

**ICOE 2010 reception.
Campos Elíseos Theatre.
Bertendona st. 3, BIS, Bilbao.**

The organisers of ICOE 2010 would like to invite all conference delegates to a reception to welcome you to Bilbao. The event will be held in one of the city's most iconic venues: the Campos Elíseos Theatre, a magnificent example of Art Deco architecture, recently re-opened after several years' restoration. Don't miss it!

**Thursday,
7 October**

20:00

**Gala Dinner.
Ría de Bilbao Maritime Museum.
Muelle de Ramón de la Sota St., 1. Bilbao
Fee: €100 per diner**

Appropriately, the conference gala dinner will be held in a museum which takes the sea as its theme. The Ría de Bilbao Maritime Museum is hosting the main social event of ICOE 2010, which will be attended by the leading authorities and speakers taking part in the conference.

With exceptional views over the waterfront and Bilbao's urban environment, this is a unique opportunity to share impressions in an entirely different setting.

Wednesday, 6 October

8:00

Registration opens the day before: 5 October)
(Registration opens the day before: 5 October)

9:00

Opening Session. With the participation of:
• The Basque Regional Minister for Industry, Innovation, Trade and Tourism Bernabé Unda Barturen.
• IBERDROLA.
• A representative from the Spanish Ministry of Industry, Trade and Tourism.

10:30

Coffee - Break

11:00

Vision Panel:
Ocean Energy Systems Implementing Agreement: An International Vision for Ocean Energy and a Review.
European Ocean Energy Road Map - A Path to the European Industrial Initiative
The United States Marine Hydrokinetic Renewable Energy Technology Draft Roadmap.
Basque Country (Spain). A Strategic Commitment to Leading the Wave Energy Sector.

12:30

Lunch at the Exhibition Area
• 12:30 - 13:30: Poster Session 1
• 13:30 - 14:30: Poster Session 2

14:30

Moving Ocean Key Research to the Renewable Energy Topics Industrial Energy Development

Economics and Cost Reduction *OTEC and Salinity Gradient* *Resource Assessment and Tools*

16:00

Coffee - Break

16:30

Planning, Permitting and Public Acceptability *Multipurpose Offshore Renewable Energy Platforms* *Investigation on Array Performance*

18:00

End of the First Day of Conference

20:00

Conference Reception
Campos Eliseos Theatre, Bilbao

Thursday, 7 October

Canada: Also an Emerging Ocean Superpower

M.I.S.

Standardisation

O.R.E.D.

Wave Energy Converters

K.R.T.

Tidal Energy: Modelling, Concepts and Challenges

Coffee - Break

Removing Barriers and Building Competences

Tidal Energy Converters

Wave Power: Concepts, Components and Characterisation

Lunch at the Exhibition Area
• 12:30 - 13:30: Poster Session 3
• 13:30 - 14:30: Poster Session 4

M.I.S.

Accelerating Progress

O.R.E.D.

Grid Integration

K.R.T.

Environmental Issues

Coffee - Break

Lessons Learnt from Other Sectors

Test Facilities: Latest Advances

Performance Assessment

End of the Second Day of Conference

Conference Gala Dinner
Ria de Bilbao Maritime Museum

Friday, 8 October

M.I.S.

Policies and National Initiatives

Coffee - Break

Round Table: Supply Chain, Utility, Regulator, Technology Developer and Finance

12:00 Poster Award & Closing Session (Conference Summary)

13:00 Closing Lunch at the Exhibition Area

Simultaneous interpretation (Spanish/English) will be available at all sessions.

Plenary Session:
Auditorium, level 4.

Parallel Sessions:
Auditorium 1, level 4.
Auditorium 2, level 4.
Room 1, level 5.

Poster Sessions:
Atrio, level 1.

ICOE at a Glance

**Wednesday,
6 October**

8:00

Registration
(Registration opens the day before: 5 October)

9:00

Opening Session.
With the participation of:

Plenary Session:
Auditorium, level 4.

- THE BASQUE REGIONAL MINISTER FOR INDUSTRY, INNOVATION, TRADE AND TOURISM
Bernabé Unda Barturen.
- IBERDROLA.
- A REPRESENTATIVE FROM THE SPANISH MINISTRY OF INDUSTRY, TRADE AND TOURISM.

10:30

Coffee - Break

11:00

Vision Panel

Chair: Henry Jeffrey, The University of Edinburgh

Plenary Session:
Auditorium, level 4.

OCEAN ENERGY SYSTEMS IMPLEMENTING AGREEMENT:
AN INTERNATIONAL VISION FOR OCEAN ENERGY AND A REVIEW.
John Huckerby (OES-IA)

EUROPEAN OCEAN ENERGY ROAD MAP - A PATH TO THE
EUROPEAN INDUSTRIAL INITIATIVE.
Alla Weinstein (European Ocean Energy Association)

THE UNITED STATES MARINE HYDROKINETIC RENEWABLE
ENERGY TECHNOLOGY DRAFT ROADMAP.
Sean O'Neill (OREC)

BASQUE COUNTRY (SPAIN). A STRATEGIC COMMITMENT
TO LEADING THE WAVE ENERGY SECTOR.
Javier Marqués (Ente Vasco de la Energía, EVE)

12:30

Lunch at the Exhibition Area

- 12:30 - 13:30: Poster Session 1
- 13:30 - 14:30: Poster Session 2

12:30 - 13:30 **Poster Session 1**

- **PS1-1. A Twin Unidirectional Turbine Topology for Wave Energy.**
T. Setoguchi
(Saga University)
- **PS1-2. The GESMEY Ocean Current Turbine. A Proposal for Marine Current Energy Extraction on Deeper Waters.**
Luis Ramon Nuñez Rivas
(E.T.S.Ingenieros Navales, Technical University of Madrid (UPM))
- **PS1-3. A Non-Resonant, Buoyancy-Type Wave Energy Converter.**
Rhys Jenkins
(University of Southampton)
- **PS1-4. Automatic System for Underwater Ocean Current Turbines. Application to GESMEY.**
Jose A. Somolinos
(ETS I Navales. Universidad Politécnica de Madrid)
- **PS1-5. Tidal Current Turbine Reliability: Power Take-Off Train Models and Evaluation.**
C. Iliev
(Heriot - Watt University, Edinburgh)
- **PS1-6. The Role of Waves on Tidal Turbine Unsteady Blade Loading.**
Ian Milne
(The University of Auckland)
- **PS1-7. Implementing Fast Multipole Algorithm (DPMTA) into the Seakeeping Diffraction/Radiation Code Aquaplus for the Simulation of Wave Energy Converters Farms.**
Bruno Borgarino
(Laboratoire de Mécanique des Fluides, École Centrale de Nantes)
- **PS1-8. On the Consequences of Fixed-Force Control Strategies on the Efficiency of Hydrostatic Transmissions.**
Yukio Kamizuru
(Institute for Fluid Power Drives and Controls of RWTH Aachen University)
- **PS1-9. Control Strategy of Wave Energy Converters Optimized Under Power Electronics Rating Constraints.**
Elisabetta Tedeschi
(Norwegian University of Science and Technology)
- **PS1-10. A Frequency-Response Design Method for the Control of Wave Energy Converters in Irregular Seas.**
Andrew P. McCabe
(Lancaster University)
- **PS1-11. Neural Control of OWC-Based Wave Power Generation Plant.**
Aitor J. Garrido
(University of the Basque Country)
- **PS1-12. Conception of a Radial Impulse Turbine for an Oscillating Water Column.**
Bruno Pereira
(Energy and Fluids Mechanics Engineering Department. University of Valladolid)
- **PS1-13. Hybrid Modeling for Optimal Control of a Linear Switched Reluctance Generator Used in a Direct Wave Energy Converter.**
Mario Vasak
(Faculty of Electrical Engineering and Computing, University of Zagreb)
- **PS1-14. The Original Renewal Wave Energy-Store System & NS-NRMEF project.**
Kao I-Nan (Chuenway Electronic Co., Ltd.)
- **PS1-15. Numerical Modeling of Fully Nonlinear Interactions of Ocean Waves with a Submerged Moving Body.**
Etienne Guerber
(EDF R&D)
- **PS1-16. Electric Linear Generator to Optimize a Point Absorber Wave Energy Converter.**
Marcos Blanco (CIEMAT)
- **PS1-17. Radial Turbine with Pitch-controlled Guide Vanes for Wave Energy Conversion.**
Manabu Takao
(Matsue College of Technology)
- **PS1-18. Hydrodynamic Performance of two-Body Heaving Wave Energy Converters.**
Jonathan Van Den Berg
(Tecnalia)
- **PS1-19. A Computational Study of a Bi-Directional Ducted Tidal Turbine.**
Clarissa Belloni
(University of Oxford)
- **PS1-20. APC-PISYS Multiple Technology System by Pipo Systems.**
Abel Cucurella (Pipo Systems)

13:30 - 14:30 Poster Session 2

- **PS2-1. A Study on the Site Selection of Offshore Wind Farm around Korean Peninsula.**
Ji Young Kim
(Korea Electric Power Research Institute)
- **PS2-2. A Study on the Design and performance Prediction of MW Class Ocean Current Turbine.**
Bumsuk Kim
(Korean Register of Shipping)
- **PS2-3. Performance Prediction of OWC Type Floating Wave Power Generation Installing Impulse Turbine.**
Masami Suzuki
(The University of Tokyo)
- **PS2-4. A Methodology for Near-Shore Wave Resource Assessment.**
Sandra Forrest
(Aquamarine Power)
- **PS2-5. Preliminary Economic Assessment and Analysis of Grid Connection Schemes for Ocean Energy Arrays.**
Joseba López Mendia
(Tecnalia)
- **PS2-6. Wave Energy Study in Canary (Sustainable Proposition).**
Isidro Padrón Armas
(University of La Laguna)
- **PS2-7. Wave Energy Atlas in Vietnam.**
Nguyen Manh Hung
(Institute of Mechanics, Hanoi)
- **PS2-8. Development of a Nearshore Sea-State Database of Reunion Island for Wave Energy Resource Assessment.**
Giovanni Mattarolo
(EDF R&D - National Hydraulics and Environment Laboratory)
- **PS2-9. Site Analysis for Ocean Energy Development in Korea.**
Keum-Seok Kang
(Korea Electric Power Research Institute)
- **PS2-10. Developing Methodologies for Quantifying the Impact of Tidal Current Energy Variability.**
Abhinaya Sankaran Iyer
(University of Edinburgh)
- **PS2-11. Numerical Simulation of Wave-Structure Interaction using Eulerian and Lagrangian CFD Methods.**
Deborah Greaves
(University of Plymouth)
- **PS2-12. Ocean Power for Australia: waves, tides and ocean currents.**
David Griffin
(Centre for Australian Weather and Climate Research)
- **PS2-13. How Tidal Energy Can Be Made to Pay.**
William Kingston
(Trinity College, Dublin)
- **PS2-14. 3-D Modelling and Assessment of Tidal Current Resources in the Bay of Fundy, Canada.**
Andrew Cornett
(NRC Canadian Hydraulics)
- **PS2-15. Determination of Metrics for the Evaluation of Environmental Disturbance from Wave Energy Arrays**
Robert A Beharie
(International Centre for Island Technology - Heriot Watt University)
- **PS2-16. Airborne and underwater noise assessment at the Pico OWC Wave Power Plant.**
André Croft de Moura
(Wave Energy Centre)
- **PS2-17. A Preliminary Protocol on Environmental Assessment for Ocean Energy Schemes.**
Robert Batty
(Scottish Association for Marine Science)
- **PS2-18. The Formation of a Domestic and International Market for Tidal Energy Technologies: the UK Economic Impact .**
Michelle Gilmartin
(University of Strathclyde)

14:30

Moving to the Industrial Scale

Economics and Cost Reduction

Chair: John Huckerby, OES-IA

- **Operational Expenditure Costs for Wave Energy Projects; O/M, Insurance and Site Rent.**

GORDON DALTON
(HYDRAULICS AND MARITIME RESEARCH CENTRE)

- **Projected Deployment and Costs of Wave Energy in Europe.**

ALEX RAVENTOS
(WAVE ENERGY CENTRE)

- **Techno-Economic WEC System Optimisation – Methodology Applied to Wavebob System Definition.**

JOCHEM WEBER
(WAVEBOB LTD)

- **A Requirement for Tidal Energy to be Cost Competitive with Off-Shore Wind Energy.**

CAMERON JOHNSTONE
(NAUTICITY LTD)

- **Tidal Power with Hammerfest Strom Technology - Towards Commercialisation.**

ALAN MORTIMER
(IBERDROLA RENOVABLES)

Ocean Renewable Energy Development

OTEC and Salinity Gradient

Chair: Yann Hervé de Roeck, IFREMER

- **Osmotic Power Plants: Potential Analysis and Site Criteria.**

PETER STENZEL
(CENTRE FOR INNOVATIVE ENERGY SYSTEMS)

- **Osmotic Power. From Prototype to Industry - What will it take?**

SJIMEN BRÆIN
(STATKRAFT)

- **DCNS OTEC Roadmap.**

EMMANUEL BROCHARD
(DCNS)

- **OTEC and Operational Oceanography.**

DOMINIQUE OBATON
(MERCATOR OCEAN)

Key Research Topics

Resource Assessment and Tools

Chair: Antonio Sarmiento, Wave Energy Centre

- **Nearshore Wave Energy Resources along Spain: Seasonal-to-Interannual Variability and Long-Term Trend.**

CESAR VIDAL
(ENVIRONMENTAL HYDRAULICS INSTITUTE "IH CANTABRIA", UNIVERSIDAD DE CANTABRIA)

- **Using Satellite Spectral Wave Data for Wave Energy Resource Characterization.**

M.T. PONTES (LNEG)

- **Reliability of Coupled Meteorological and Wave Models to Estimate Wave Energy Resource in the Bay of Biscay.**

LUIS FERRER (AZTI-TECNALIA)

- **Development and Application of a Marine Energy Resource Database.**

THOMAS DAVEY
(THE UNIVERSITY OF EDINBURGH)

16:00

Coffee - Break

16:30

Moving to the Industrial Scale

Planning, Permitting and Public Acceptability

Chair: Melanie Nadeau, Natural Resources Canada

- Do's and Don'ts of the Appropriate Assessment: Lessons for Permitting, Experiences from Coastal Projects in or near Protected Sites.
FRANK NEUMANN
(INSTITUTE FOR INFRASTRUCTURE, ENVIRONMENT AND INNOVATION)
- Wave and Tidal Energy in the Maritime Spatial Planning Process.
LAURA ZUBIATE (TECNALIA)
- Towards Best Practices for Public Acceptability in Wave Energy: Whom, When and How to Address.
JULIA FERNANDEZ-CHOZAS
(SPOK APS / AALBORG UNIVERSITY)
- Marine Spatial Planning and its Application in the Marine Energy Field in France.
FRÉDÉRIC VILLERS
(CETMEF)

Ocean Renewable Energy Development

Multipurpose Offshore Renewable Energy Platforms

Chair: Jose Luis Villate, TECNALIA

- Floating Offshore Wind System: The WindFloat.
ALLA WEINSTEIN (PRINCIPLE POWER INC.)
- ORECCA - a European Coordination Action on Offshore Renewable Energy Conversion Platforms.
JOCHEN BARD
(FRAUNHOFER IWES)
- MARINA Platform Project: First Steps towards Deep Offshore Wind/Ocean Energy Conversion.
RAUL MANZANAS
(ACCIONA ENERGIA)
- Alternatives for the Design of Grid Connection Infrastructures for Wave Energy.
PIERPAOLO RICCI
(TECNALIA)

Key Research Topics

Investigation on Array Performance

Chair: Sean O'Neill, Ocean Renewable Energy Coalition

- Performance of Multi-Arrayed Tidal Current Power Rotors.
CHUL H. JO
(INHA UNIVERSITY)
- Inter-Device Spacing Issues within Wave and Tidal Energy Converter Arrays.
L.E. MYERS
(UNIVERSITY OF SOUTHAMPTON)
- A Time Domain Analysis of Arrays of Floating Point-Absorber Wave Energy Converters Including the Effect of Nonlinear Mooring Forces.
PEDRO C. VICENTE (IST)
- Physical Investigations into the Capture Width of an Array of OWC Wave Pumps for Maximum Efficiency.
DAVIDE MAGAGNA
(UNIVERSITY OF SOUTHAMPTON)

18:00

End of the First Day of Conference

20:00

Conference Reception
Campos Elíseos Theatre, Bilbao

8:00

Canada: Also an Emerging Ocean Superpower

9:00

Moving to Industrial Scale

Standardisation

Chair: David Ingram, The University of Edinburgh

- Developing International Standards for Marine Energy Converters.
MELANIE NADEAU
(NATURAL RESOURCES CANADA)
- The Need for Performance Appraisal Procedures for Ocean Energy Converters.
A.S. BAHAJ
(UNIVERSITY OF SOUTHAMPTON)
- Support for International Standards Development, Marine and Hydrokinetic Renewable Energy in the United States.
NEIL RONDORF (SAIC)
- OES-IA Guidance on Assessing Tidal Current Energy Resources.
ANDREW CORNETT
(NRC CANADIAN HYDRAULICS CENTER)

Ocean Renewable Energy Development

Wave Energy Converters

Chair: Eoin Sweeney, Sustainable Energy Authority of Ireland

- Mutriku Wave Power Plant: Lessons Learnt.
YAGO TORRE-ENCISO
(ENTE VASCO DE LA ENERGÍA)
- Design of the Next Generation of Oyster Wave Energy Converter.
DAVID KAYE
(AQUAMARINE POWER)
- First Power Production Figures from the Wave Star Roshage Wave Energy Converter.
L. MARQUIS
(WAVE STAR A/S)
- Straumekraft AS: Durable and Profitable Wave Power.
INGVALD STRAUME
(STRAUMEKRAFT AS)
- Wave Dragon from Demonstration to Market
HANS CHR. SØRENSEN
(WAVE DRAGON APS)

Key Research Topics

Tidal Energy: Modelling, Concepts and Challenges

Chair: Peter Fraenkel, Marine Current Turbines

- Numerical Modelling of Cross-Flow Turbines: A Direct Comparison of Four Prediction Techniques.
PETER B JOHNSON
(UNIVERSITY COLLEGE LONDON)
- Wake Properties Characterisation of Marine Current Turbines.
GREGORY GERMAIN (IFREMER)
- Bay of Fundy Tidal Energy Development: Opportunities and Challenges.
GREGORY C. TROWSE
(DALHOUSIE UNIVERSITY)
- An Innovative Tidal Fence Development for the Severn Estuary, UK
JACK GILES
(UNIVERSITY OF SOUTHAMPTON AND IT POWER LTD)

10:30

Coffee - Break

11:00

Moving to Industrial Scale

Removing Barriers and Building Competences

Chair: Gouri Bhuyan, Powertech Labs Inc

- Marine Renewable Energy - Research Challenges and Opportunities for a new Energy Era in Europe
EOIN SWEENEY
(SUSTAINABLE ENERGY AUTHORITY OF IRELAND)

- Ocean Líder: Ocean Renewable Energy Leaders.
JUAN AMATE LÓPEZ
(IBERDROLA INGENIERIA Y CONSTRUCCION)

- Industry Navigates Ocean Energy's Potential.
MARIANNE BOUST
(EMERGING ENERGY RESEARCH)

- On INORE and the Use of Multidisciplinary Teams in Short Lead Time Technical Consultation.
TOM MCCOMBES
(INORE STEERING COMMITTEE)

Ocean Renewable Energy Development

Tidal Energy Converters

Chair: Jochen Bard, Fraunhofer IWES

- ALSTOM's first Tidal In Stream Energy Converter Demonstration Project.

PHILIPPE GILSON
(ALSTOM POWER)

- Development and Certification of the Voith Hydro HyTide 110 Tidal Turbine.

RAPHAEL ARLITT
(VOITH HYDRO OCEAN CURRENT TECHNOLOGIES GMBH & Co. KG)

- The Sabella Tidal Turbine - Tests Results and Further Development.

JACQUES RUER
(SABELLA SAS)

- Development and testing of Marine Current Turbine's SeaGen 1.2MW tidal stream turbine.

PETER FRAENKEL
(MARINE CURRENT TURBINES)

- The Pulse Stream Concept, and the Developmet of the Pulse Stream Commercial Demonstrator.

MARC PAISH
(PULSE TIDAL)

Key Research Topics

Wave Power: Concepts, Components and Characterisation

Chair: Tony Lewis, HMRC, University College Cork

- Experimental Investigation of Hydrodynamic Characteristics of a Moored Floating WEC
WANAN SHENG
(HMRC, UNIVERSITY COLLEGE CORK)

- Power Umbilical for Ocean Renewable Energy Systems - Feasibility and Dynamic Response Analysis.
LUCA MARTINELLI
(UNIVERSITY OF BOLOGNA)

- The Potential for Wave Energy in the North Sea.
HANS CHR. SORENSEN
(SPOK APs/EU-OEA)

- Modular Wave Energy Plants for Desalination Applications in Islands.
V. JAYASHANKAR
(IIT MADRAS)

12:30

Lunch at the Exhibition Area

- 12:30 - 13:30: Poster Session 3
- 13:30 - 14:30: Poster Session 4

- **PS3-1. Implication of Froude Scaling in the Numerical Testing of a Generic Support Structure.**
Patricia Okorie
(The Robert Gordon University, Aberdeen)
- **PS3-2. Experimental Analysis of the Local Flow Effects Around Single Row Tidal Turbine Arrays.**
Tim Daly (University of Southampton)
- **PS3-3. Accounting for Turbulence in a Regional Numerical Model for Tidal Current Turbine Farm Planning.**
Thomas Roc
(University of Plymouth)
- **PS3-4. Paimpol-Bréhat Tidal Turbine Demonstration Farm (Brittany): Optimisation of the Layout, Wake Effects and Energy Yield Evaluation Using Telemac.**
Chi-Tuân Pham
(EDF Research and Development)
- **PS3-5. Performance Analysis and Design of the Vertical Axis Tidal Stream Turbine.**
Beom-Soo Hyun
(Korea Maritime University)
- **PS3-6. The Response of Tidal Resonance to the Presence of a Barrage Using a Two Dimensional Numerical Model.**
Laura Finlay
(University of Edinburgh)
- **PS3-7. Modelling of the Overtopping Flow on the Wave Dragon Wave Energy Converter.**
Stefano Parmeggiani
(Wave Dragon ApS)
- **PS3-8. Servomotor Controlled Piston Rig for the Simulation of an Oscillating Water Column Air Chamber.**
Florent Thiebaut (Hydraulic and Maritime Research Centre, University College Cork)
- **PS3-9. Studies of a Scale Tidal Turbine in Close Proximity to Waves.**
Pascal Galloway
(University of Southampton)
- **PS3-10. ISWEC: experimental tests on a small scale prototype model.**
Giovanni Bracco
(Politecnico di Torino)
- **PS3-11. Modelling High Axial Induction Flows in Tidal Stream Turbines with a Corrected Blade Element Model.**
M.R. Willis (Swansea University)
- **PS3-12. A Combined CFD-BEM Model for Tidal Stream Turbines.**
A. J. Williams
(Swansea University)
- **PS3-13. Laboratory Investigation of the Inertia Modification on the Power Capture from Pitching Vertical Cylinders.**
F. Flocard
(The University of Sydney)
- **PS3-14. Test Rig Design and Development for Linear Bearings in Direct Drive Generators.**
Sarah Caraher
(Institute for Energy Systems, University of Edinburgh)
- **PS3-15. Actuator Disk Modeling in Support of Tidal Turbine Rotor Testing.**
Michael Shives
(University of Victoria)
- **PS3-16. Computational Analysis of Ducted Turbine Performance.**
Michael Shives
(University of Victoria)
- **PS3-17. Contra Rotating Marine Turbines Tank Tests to Analyse System Dynamic Response.**
Stephanie Ordóñez-Sánchez
(University of Strathclyde)
- **PS3-18. Modelling Unsteady Wake Effects in Arrays of Marine Current Turbines.**
Tom McCombes
(ESRU, University of Strathclyde)
- **PS3-19. Experimental and Computational Modelling of the OWEL Wave Energy Converter.**
Mark Leybourne
(University of Southampton)
- **PS3-20. Generic Dynamic Modelling for the Grid Integration of Ocean Energy Devices.**
Darren Mollaghan
(Hydraulics & Maritime Research Centre, University College Cork)

13:30 - 14:30 **Poster Session 4**

- **PS4-1. Enhancing Precision and Reliability of Tri-axial Load Cells for Mooring Load Measurements.**
Maxim Ponomarev
(University of Exeter)
- **PS4-2. Integration of Wave Energy Converters into Coastal Protection Schemes.**
Mirko Castagnetti
(University of Bologna)
- **PS4-3. Composite Seawalls for Wave Energy Conversion: 2D Experimental Results.**
Dimitris Stagonas
(University of Southampton)
- **PS4-4. Application of Sediment Transport Technologies to Offshore Energy Installations.**
Richard A. Jepsen
(Sandia National Laboratories)
- **PS4-5. Evaluation of the Accessibility of a Tidal Turbine Farm.**
Sylvain Saviot
(EDF)
- **PS4-6. Once in a Lifetime Coatings- Anticorrosion and Underwater Maintenance Solutions.**
Antonio Muñoz
(SINTEMAR)
- **PS4-7. Noise Associated with Small Scale Drilling Operations.**
Miles Willis
(Marine Energy Research Group, Swansea University)
- **PS4-8. Analyzing the UK Wave Energy Sector Using SNA as a Key Functionality Indicator.**
Angus Vantoch-Wood
(University of Exeter)
- **PS4-9. The Potential for Ocean Energy in the Region of Andalusia (South of Spain).**
Jan E. Hanssen
(EnerOcean S.L.)
- **PS4-10. Planning and Optimising the Construction and O&M Strategy of Tidal Stream Turbine Arrays.**
Mat Thomson
(Garrad Hassan)
- **PS4-11. An Operational Hydrodynamic Model of a Key Tidal-Energy Site: Inner Sound of Stroma, Pentland Firth (Scotland, UK).**
Matthew Easton
(Environmental Research Institute)
- **PS4-12. Life Cycle Assessment of renewable energy technologies - Ecobalance and Cumulated Energy Demand -.**
Jessica Lohmann
(Ruhr-University Bochum)
- **PS4-13. Toward Best Practices for Public Acceptability in Wave Energy: Issues Developers Need to Address.**
Maria Stefanovich
(Oregon State University)
- **PS4-14. Energy Storage System Sizing for Smoothing Power Generation of Direct Wave Energy Converters.**
Judicaël Aubry
(SATIE, ENS Cachan Antenne de Bretagne, CNRS, UEB)
- **PS4-15. Benefits for Development of Wave and Tidal Energy Conversion from the Lessons Learned in Wind Energy.**
Gabriele Michalke
(Robert Bosch GmbH)
- **PS4-16. Corrosion And Cathodics Protection Problems.**
Oscar Rodríguez Peralta
(ZINETI, S.A.)
- **PS4-17. Enterprise Working Group on Ocean Energy in the Basque Country. An Initiative Conveyed by the Cluster de Energía.**
Juan José Alonso
(Cluster de Energía)
- **PS4-18. Wind Energy Off-Shore, a Sea of Opportunities?**
Rafael Sagarduy
(IDOM Ingeniería y Consultoría, S.A)
- **PS4-19. Sea Submerged Aero-Generator or Hybrid Sailboat: Modeling and its Energy Generation Possibilities.**
Juan Luis Larrabe Barrena
(UPV/EHU)
- **PS4-20. Effect of Wave Direction Relative to Wind on the Motions of Offshore Floating Wind Turbine Systems.**
Maxime Philippe
(École Centrale de Nantes)

14:30

Moving to the Industrial Scale

Accelerating Progress

Chair: Chris Campbell, OREG

- Achieving Commercial Scale Manufacturing in Wave Marine Power – Investment Banking Perspective
DANIELA DALTON
(ROYAL BANK OF SCOTLAND (RBS))

- Paimpol-Bréhat : Development of the First Tidal Current Array in France
PIERRE BRUN
(EDF)

- Wave Energy - Towards Commercialisation
DAVID LANGSTON
(VOITH HYDRO WAVEGEN)

- Accelerating U.S. Marine and Hydrokinetic Technology Development through the Application of Technology Readiness Levels
TIM RAMSEY
(INSPIRED SYSTEMS, LLC)

Ocean Renewable Energy Development

Grid Integration

Chair: Jean-François Dhedin, EDF

- Electricity System Scenario Analysis to Determine Level of Wave Power that can be Integrated: A Case Study.
G. S. BHUYAN
(POWERTECH LABS INC, A SUBSIDIARY OF BC HYDRO)

- Grid Integration of Wave Energy Farms: Basque Country Case Study.
MAIDER SANTOS
(TECNALIA)

- Wave Energy Grid Integration in Ireland – A Case Study.
ANNE BLAVETTE
(HYDRAULICS AND MARITIME RESEARCH CENTRE)

- Effects of Array Configuration Network Impacts and Mitigation of Arrays of Wave Energy Converters Connected to Weak Rural Electricity Networks.
A. J. NAMBIAR
(INSTITUTE OF ENERGY SYSTEMS, UNIVERSITY OF EDINBURGH)

Key Research Topics

Environmental Issues

Chair: Javier Marqués / Yago Torre-Enciso, EVE

- Accelerating Ocean Energy to the Marketplace – Environmental Research Underway at the US Department of Energy National Laboratories.

ANDREA E. COPPING
(PACIFIC NORTHWEST NATIONAL LABORATORY)

- Simplified Method for Preliminary EIA of WE Installations Based on New Technology Classification.
LUCIA MARGHERITINI
(AALBORG UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING)

- Marine/Wave Energy Converters. Research on Environmental Impacts in Spain.
JUAN BALD (AZTI-TECNALIA)

- Predicting the Abilities of Marine Vertebrates to Evade Collision with Tidal Stream Turbines.
ROBERT BATTY
(SCOTTISH ASSOCIATION FOR MARINE SCIENCE)

16:00

Coffee - Break

16:30

Moving to the Industrial Scale

Lessons Learnt from Other Sectors (Short Oral Presentations)

Chair: Neil Rondorf, SAIC

- The Importance of Cable to Renewable Energy - or - "It All Comes Down to Cables and Connectors".
SCOTT GARDEN (NWS GMBH - GENERAL CABLE)
- Innovations for Extreme Mooring Conditions.
J. NAVAS (VICINAY CADENAS S.A.)
- Connectorization / Power Take Offs.
AREK POREBSKI (HYDRO GROUP)
- Electrical Generator and power Electronics Design for the Optimal Ocean Energy Farm.
MATT CUNNINGHAM (CONVERTEAM LTD)
- Marine Fouling and Corrosion Protection for Off-Shore Ocean Energy Setups.
DIEGO MESEGUER YEBRA (HEMPEL A/S)
- Efficient Offshore Wind Turbine Foundation.
PETER GORLITZ (DENSIT APS)
- Innovative Elastomeric Components Applicable to Current and Future Ocean Energy Developments.
JEAN-PIERRE CHAUMIEAU (TECHLAM)
- Support Offshore Floating Platforms.
FRANCISCO SARRIAS PEDEMONTE (MARINA SEA INITIATIVES S.L.)
- Marine Composites for Ocean Energy applications: Ensuring Long-Term Durability
PETER DAVIES (IFREMER)

Ocean Renewable Energy Development

Test Facilities: Latest Advances (Short Oral Presentations)

Chair: Luis Gómez-Chavarría, IBERDROLA

- Design and Engineering of the Wave Hub Project.
CHAS SPRADBERRY (JP KENNY)
- Marine Power. Experience in BIMEP and Development Framework.
BORJA ZARRAGA (SENER INGENIERÍA Y SISTEMAS S.A)
- The Development of a Wave Energy Test Site in Belmullet (Ireland): Experience to Date.
JULIE ASCOOP (ARUP CONSULTING ENGINEERS)
- SEM-REV Test Site Advancement within the French Context.
HAKIM MOUSLIM (ÉCOLE CENTRALE DE NANTES)
- PLOCAN: Toward Establishing an Oceanic Testbed for Ocean Energy Converters.
JAVIER GONZÁLEZ (OCEANIC PLATFORM OF THE CANARY ISLANDS (PLOCAN))
- Reunion Island/Indian Ocean, a French Experimental Key Laboratory for Ocean Energy.
LAURENT GAUTRET (ARER)
- Development of a Marine Component Testing Facility for Marine Energy Converters
PHILIPP R. THIES (UNIVERSITY OF EXETER)
- Ensuring Reliability for Marine Renewable Drive Train Systems – Nautilus Testing Facilities
JAMIE GRIMWADE (NEW AND RENEWABLE ENERGY CENTRE – NAREC)

Key Research Topics

Performance Assessment

Chair: Ian Bryden, The University of Edinburgh

- The PerAWaT Project: Performance Assessment of Wave and Tidal Array Systems.
ROBERT RAWLINSON-SMITH (GARRAD HASSAN)
- Influence of Flow Confinement on the Performance of a Cross-Flow Turbine.
CLAUDIO A. CONSUL (UNIVERSITY OF OXFORD)
- Effects of Turbulance and WCI on the Performance of Tidal Turbines.
JOCHEN BARD (FRAUNHOFER IWES)
- Tidal Current Energy: Further Development of Protocols for Equitable Testing of Device Performance.
SCOTT J. COUCH (UNIVERSITY OF EDINBURGH)

18:00

End of the Second Day of Conference

20:00

Conference Gala Dinner
Ría de Bilbao Maritime Museum

Friday,
8 October

8:00

9:00

Moving to the Industrial Scale

Policies and National Initiatives

Chair: *Nathalie Rousseau, EU-OEA*

• **Developing Ocean Energy: The Spanish Industrial Strategy.**

ROBERTO LEGAZ
(SPANISH RENEWABLE ENERGY ASSOCIATION- APPA)

• **Removing Barriers for Development through Policy Development; the UK Case Study.**

OLIVER WRAGG (RENEWABLE UK)

• **French Technology Platform on Marine Renewable Energies: A Set of Scientific and Technological Facilities for an Industrial Development.**

YANN-HERVÉ DE ROECK (IFREMER)

• **The Portuguese Initiatives in a European Framework for Ocean Energy.**

ANTONIO SARMENTO
(WAVE ENERGY CENTRE)

• **Growing an Ocean Energy Strategy in Energy-Rich Canada.**

CHRIS CAMPBELL (OREG)

10:30

Coffee - Break

11:00

Round table: *Moderated by Chris Campbell (OREG)* with the participation of key actors from different sectors: Supply Chain, Utility, Regulator, Technology Developer and Finance

12:00

Closing session: Poster Award & Conference Summary

Antonio Sarmiento (Wave Energy Centre) - KEY RESEARCH TOPICS

Jochen Bard (Fraunhofer IWES) - OCEAN RENEWABLE ENERGY

John Huckerby (OES-IA) - MOVING TO THE INDUSTRIAL SCALE

Jose Luis Villate (TECNALIA) - FINAL REMARKS

13:00

Closing Lunch at the Exhibition Area

Waveplam Workshop

5th October 2010
BEC, Bilbao Exhibition Centre
Free registration

The "Wave Energy in the European RES-e Market. The Waveplam Project Results" workshop to be held on 5 October 2010 at the Bilbao Exhibition Centre in Barakaldo is one of the activities organised by Ente Vasco de la Energía paralleling the International Ocean Energy Conference and Exhibition, ICOE 2010 Bilbao.

The purpose of the workshop is to present the current role of wave energy in the European renewable energy market, and the potential for this energy type in the short-term future.

Time	Tuesday 5th October
8.30	Registration
9.00	Introduction
9.10	State of the art. HMRC- University College Cork, Ireland
9.30	Non-technological barriers. Wave Energy Centre, Portugal.
9.50	Good Practice. EU-OEA, Belgium.
10.10	Debate
10.30	Coffee break
11.00	Selection of sites. Robotiker-TECNALIA
11.20	Guide for investors and promoters of wave power projects. Ente Vasco de la Energía
11.40	Presentation of specific studies on site-location
12.10	Debate
12.30	Networking: Interaction with sea-using target audiences. Includes transport to a site on the coast, lunch and networking with the surfing community.
16.30	End of symposium and return to BEC

EquiMar Protocol Workshops

4th – 5th October 2010
BEC, Bilbao Exhibition Centre

Target audience: Regulators, policy makers, financial institutions, standards agencies, project developers

Time	Monday 4th October
14.00	Introduction
14.30	Presentations on protocol content: <ul style="list-style-type: none"> • Project assessment and market assessment • Environmental assessment • Engineering and technical overview: Resource assessment and device development
16.00	Coffee break with opportunity for discussions with EquiMar partners
16.30	Case studies (Presentations from protocol end users): <ul style="list-style-type: none"> • EDF–View from a project developer • DNV–View from a certification agency • TECNALIA–View from an ongoing test site development
18.00	Wine and canapés, with opportunities for further discussions with EquiMar partners

Target audience: Engineers, device and technology developers, researchers, supply chain

Time	Tuesday 5th October
9.30	Introduction
10.00	Presentations on protocol content: <ul style="list-style-type: none"> • Resource assessment • Tank testing and sea trials • Array deployment • Economics and environmental overview
12.00	Coffee break with opportunity for discussions with EquiMar partners
12.30	Case studies(Presentations from protocol end users): <ul style="list-style-type: none"> • EDF–View from a project developer • Wave Dragon–View from a wave energy device developer • Teamwork Technology–View from a tidal energy device developer
14.00	Wine and canapés, with opportunities for further discussions with EquiMar partners



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