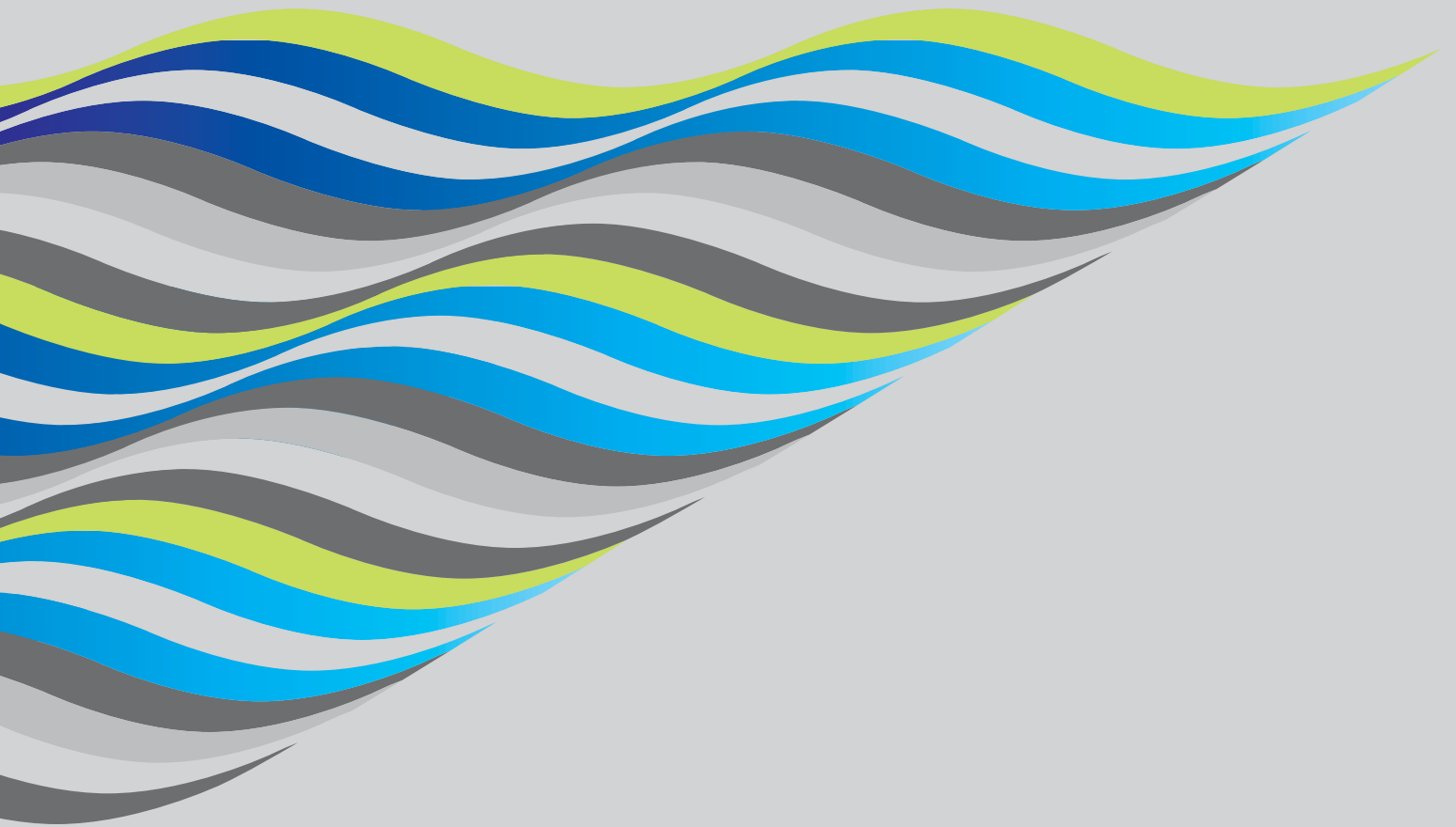


DUBLIN 4TH INTERNATIONAL
17 – 19 CONFERENCE
OCT ON
2012 OCEAN ENERGY



ICOE
2012
INTERNATIONAL CONFERENCE
ON OCEAN ENERGY



CONFERENCE PROGRAMME

Presented by



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Dear Delegates

As the current chairman of the International Committee, it gives me great pleasure, on behalf of the Committee, to welcome you to ICOE 2012, the 4th holding of this event. We follow a proud succession of European port cities – Bremen, Brest and Bilbao – in the venue for this conference, and welcome the further voyage of the ICOE ‘ship’ into international waters.

I must thank my colleagues on the International Committee for their work, over the past two years, in helping to develop the programme for this conference. I want to thank, too, our partner organisations, OES, the Implementing Agreement for Ocean Energy of the International Energy Agency and the European Ocean Energy Association, our host organisation, the Sustainable Energy Authority of Ireland, their partners, sponsors and contractors, and the many individuals whose hard work has brought this assembly of companies, organisations and individuals together for what, we hope, will be an exciting and important event.

The ongoing evolution of ICOE, as the global forum for sharing industrial perspectives and experience about the many challenges associated with Ocean Energy, is intended to parallel and enhance similar efforts at national and regional level. We welcome the growing association with OES, the intergovernmental collaboration agreement of the International Energy Agency, and applaud their generous prize award for the best Poster. We believe that it is entirely appropriate that this association should grow and develop into the future.

The development of ocean energy technologies is, inherently, a demanding task. We are taking complex engineering into dynamic and hostile environments. It is also an expensive task, as is the development of any major energy technology and infrastructure. In the current economic environment it is an extremely challenging time for OE technology and project developers. Events like ICOE are very important in a number of ways: they support the essential collaborations between the many subsectors and players that make up the sector, they inform the policy-makers and regulators and, particularly in a venue like the CCD in the centre of a capital city, it communicates the inspiring message of opportunity that is also inherent in ocean energy.

We hope that ICOE 2012 will inform and inspire you and that the experience will be valuable and enjoyable for all delegates, exhibitors and visitors. We on the Committee look forward to interacting with you all during the event.

Eoin Sweeney
Chair, ICOE 2012 Committee



Dear Delegates

I would like to welcome you all to Dublin, Ireland for ICOE 2012. The Convention Centre Dublin is located on the banks of the River Liffey, a river which has contributed to the evolution of Dublin as a leading European and worldwide capital. It has been the backdrop for many historic events for Ireland over the centuries.

It is appropriate therefore that we gather here in 2012 to consider the global response to the era-defining challenges of sustainable energy and climate change, to be fuelled, in part at least, by the waters which surge against our coasts.

Our oceans hold vast untapped resources of ocean and offshore wind energy with the potential to power the global economy. Already the ocean energy revolution is underway with brilliant minds across the globe dedicated to imagining the ideas, developing the concepts, refining the prototypes and deploying the solutions. It calls for leading edge creativity from scientists and engineers. But it also requires the backing of the financial community, the forward thinking policies of national governments and international agencies, coupled with the development and funding of the necessary infrastructure. We also need to ensure wide societal participation and support.

Ireland's first great electrification project early in the 20th century was powered by the waters of the Shannon, Ireland's largest river. Now, at the start of the 21st century, Ireland finds itself once more on the cusp of something historic – the utilisation of our tremendous marine energy resource. Ireland has high aspirations for this sector and we are proud to host this gathering of so many equally committed and enthusiastic countries, organisations and people.

ICOE 2012 brings to Dublin 700 delegates from more than 40 countries. The extensive conference programme coupled with the trade exhibition, networking events and technical tours should make for a very engaging three days.

So please allow me to wish each and every dignitary, delegate, exhibitor and sponsor a very successful and enjoyable event, from which we can all learn and prosper.

Dr Brian Motherway
Chief Executive, Sustainable Energy
Authority of Ireland



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NATIONAL COMMITTEE

Prof. J. Owen Lewis

Stephen O'Sullivan, SEAI

Lisa Marie Powell, SEAI

Tony Lewis, HMRC

Olive Hill, Invest NI

Peter Heffernan, Marine Institute

Karen Conroy, Enterprise Ireland

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Lt. Cdr. Brian Fitzgerald, Defence Forces

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Anton Navarro, Iberdrola Renovables, Spain

Gouri Bhuyan, Canada

Chris Campbell, OREG, Canada

Tony Lewis, University College of Cork, Ireland

Michel Paillard, IFREMER, France

Nathalie Rousseau, EU-OEA

Jose Luis Villate, Tecnalia, Spain

Peter Fraenkel, Fraenkel Wright, United Kingdom

Paul Holthus, World Ocean Council

Mann-eung, Kim, Korean Shipping register, Republic of Korea

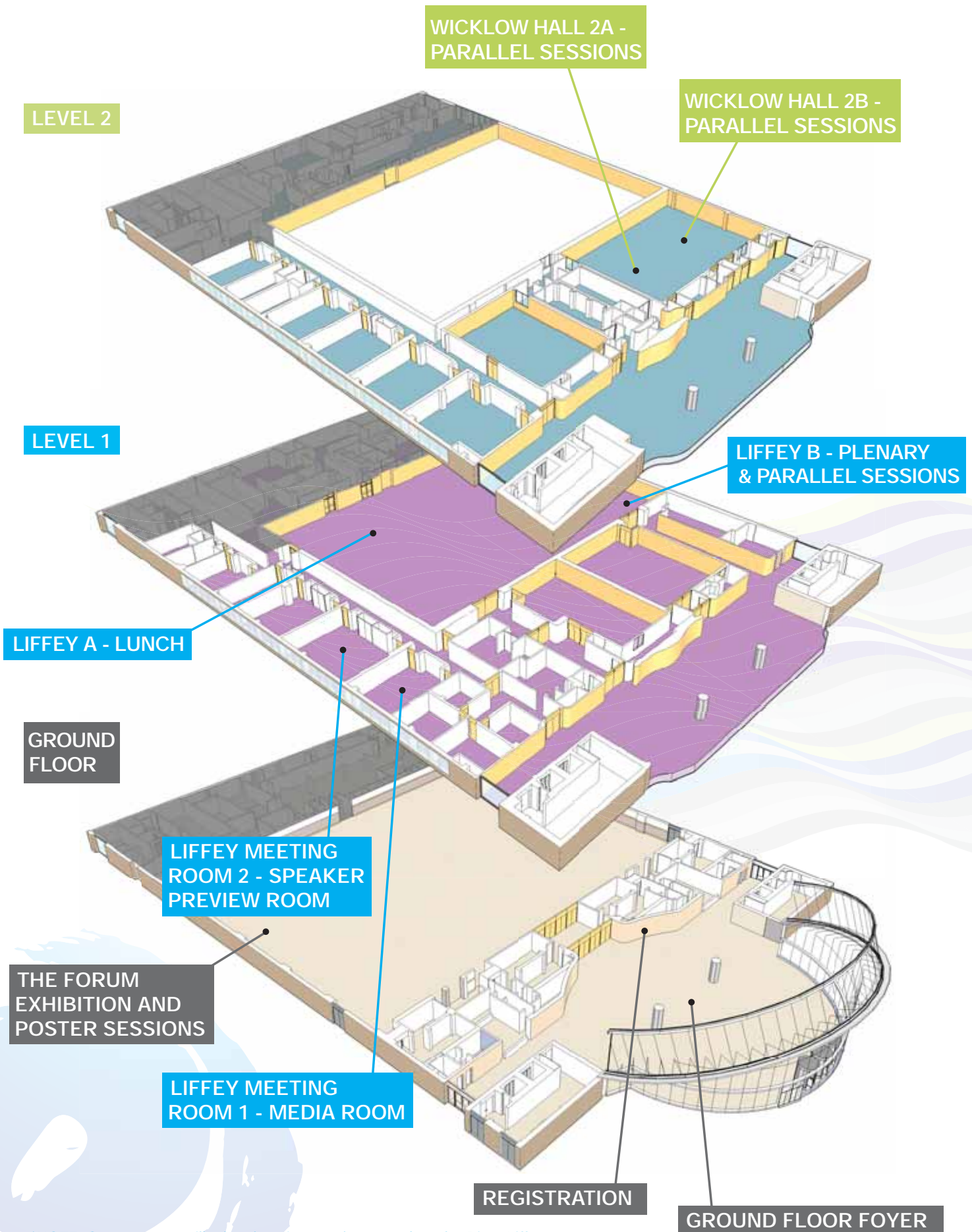
Eoin Sweeney, SEAI, Chair ICOE 2012

CONFERENCE ORGANISERS

Sarah Collins, Conference Partners

Elva Hickey, Conference Partners

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**NOTE: Some events will take place in vessels moored on the River Liffey.*

ICOE 2012 SOCIAL EVENTS

WHAT: **ICOE 2012 Welcome Reception**
WHEN: **Wednesday 17th October**
TIME: **18.00 – 20.00**
WHERE: **Exhibition Hall, The Forum**

ICOE 2012 delegates will gather in the exhibition hall for a reception, with a special welcome from the Deputy Lord Mayor of Dublin Cllr. Clare Byrne. Canapés and refreshments will be served. This is time to relax and wind down after day 1 of ICOE 2012, while mingling with your friends and industry colleagues from all over the globe.

WHAT: **ICOE 2012 Gala Dinner**
WHEN: **Thursday 18th October**
TIME: **19.00 – 23.00**
WHERE: **Trinity College Dublin**
TRANSPORT: **18.45. Coach will depart outside Convention Centre Dublin**

The 2012 ICOE Gala Dinner is taking place in the historic and wonderful ground of Trinity College Dublin. Delegates will be treated to a private viewing of the Book of Kells before being taken to the famous Long Room for a drinks reception with enchanting harp music. Dinner will follow across the cobbled stones to Trinity College Dining Hall with special after dinner entertainment. Limited tickets are available for the Gala Dinner, if you wish to attend please go to the ICOE Information Desk, located at the Registration Area on the Ground Floor.



OTHER SOCIAL EVENTS

WHAT: **Canadian Embassy Reception (Invitation Only)**
WHEN: **Wednesday 17th October**
TIME: **19.00 – 20.30**
WHERE: **L.É Roisín, directly outside the Convention Centre Dublin, on the river**

In honour of Canada's participation at ICOE 2012 his Excellency Loyola Hearn, Ambassador of Canada is holding a private reception on the Irish Naval Vessel, the L.É Roisín.

WHAT: **Invest Northern Ireland Reception (Invitation Only)**
WHEN: **Thursday 18th October**
TIME: **18.00 – 20.00**
WHERE: **L.É Roisín, directly outside the Convention Centre Dublin, on the river**

Guests attending Invest Northern Ireland's reception will hear from Professor Trevor Whittaker of Queen's University, Belfast. This world-renowned expert in marine energy will speak about Northern Ireland's unparalleled expertise in this area. For those attending the ICOE 2012 Gala Dinner, coaching will be available to Trinity College Dublin at 19.00

TECHNICAL VISITS

WHAT: Open Hydro and SeaGen
WHEN: Saturday 20th October
TIME: 07.00 – 18.00
TRANSPORT: 07.00. Departs from the front entrance of the Convention Centre Dublin

This technical tour will bring delegates to see Open Hydro's tidal turbine manufacturing facility in Greenore and the MCT SeaGen turbine in Strangford Lough. The trip includes coaching, ferry transfer from Strangford to Portaferry and lunch.

It is advised to bring waterproof coats and a scarf to keep you warm and dry on this trip!

Maximum numbers for this trip are 100 people, with only a few places left. If you are interested please go to the ICOE Information Desk, located at the Registration Area on the Ground Floor.



OTHER SIDE EVENTS

WHAT: The second OES-IA Annex IV Expert Workshop on the Environmental Effects of Marine Renewable Energy Development. (Invitation Only)

WHEN: Monday 15th October
WHERE: Convention Centre Dublin

This workshop is being organised by the Pacific Northwest National Laboratory, on behalf of the U.S Department of Energy and the Annex IV nations.

WHAT: SOWFIA Project – Third Workshop
 Navigating the Wave Energy Consenting Process: Sharing Knowledge and Implementation of Regulatory Measures

WHEN: Tuesday 16th October
WHERE: Guinness Storehouse
TIME: 11.00 – 17.00



WHAT: TROPOS FP7 Project: First Dissemination and Communication Workshop
BEYOND THE HORIZON: the Role of multiuse offshore platforms in the Oceans of Tomorrow.

WHEN: Tuesday 16th October
WHERE: Guinness Storehouse
TIME: 18.00 – 20.00

Organisers Pedro Mayorga & Jan Hanssen at EnerOcean. Attendees registered in advance.

WHAT: **B to B with France at ICOE 2012 - Facilitating business relations between French-based companies and you**
WHEN: **Tuesday 16th October / Wednesday 17th October**
WHERE: **Clarion Hotel Dublin (16th) / Convention Centre Dublin (17th)**
The French Trade Commission, UBiFrance in Ireland, the Ireland France Chamber of Commerce and their partners have organised this event to the Renewable Energies. For further details please email christine.deniel@ubifrance.fr

WHAT: **Meeting of the Project Team for IEC62600-2 'Design' under ICE Technical Committee 114**
WHEN: **Tuesday 16th October / Wednesday 17th October**
Meeting hosted by ESB who participate on the committee and also by the Commissioner of Irish Lights.
Participation by members only

WHAT: **IMERC Showcase**
WHEN: **Duration of the Conference (17th – 19th October)**
WHERE: **L.É Roisín (Visit Exhibition Stand 55 for more details)**

WHAT: **Canadian Networking Breakfast**
WHEN: **Thursday 18th October**
WHERE: **Clarion Hotel Dublin**
TIME: **07.30 – 09.00**
The Canadian Ambassador to Ireland, H.E., Loyola Hearn will host and introduce 15 exhibiting Canadian companies and organizations to an invited international audience. Minister Bernard Valcourt, Associate Minister of National Defence and Minister of State, Atlantic Canada Opportunities Agency together with Chris Campbell, Director, Marine Renewables Canada plus 4 additional Canadian speakers will provide background on the Canadian ocean energy sector, encourage partnerships and investment opportunities with global players.

For further information and/or interest in attending, contact
Gerry Mongey, Trade Commissioner, Canadian Embassy Dublin
tel: 353-1-234 4017
email: gerry.mongey@international.gc.ca

WHAT: **UCC Beaufort Launch (Invitation Only)**
WHEN: **Thursday 18th October**
WHERE: **L.É Roisín**
TIME: **13.00**
The Beaufort Laboratory, UCC's presence on the IMERC campus, is dedicated to multidisciplinary research and knowledge transfer to support sustainable resource developments and innovation in the maritime field.

WHAT: **International Network on Offshore Renewable Energy (INORE) workshop**
WHEN: **Friday 19th October**
WHERE: **Convention Centre Dublin**
TIME: **14.00 – 16.00**
Open to young researchers and early stage career researchers, this workshop provides an informal and interactive programme and a chance to meet other young researchers and make useful contacts for your own work. The workshop comprises of an afternoon of discussions with invited panelists working within offshore renewable energy, followed by a networking evening meal. Panelists to be arranged from the tidal, wind and wave sectors.

Register for this workshop at www.inore.org
Any queries contact **Hannah Buckland, Event Coordinator**, 513924@swansea.ac.uk

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WEDNESDAY, OCTOBER 17th

08:00 – 09:30

Registration

Ground Floor Foyer

08:30 - 10:15

ICOE 2012 Conference Opening Session

Liffey B

10:15 - 10:45

Coffee Break, Exhibition Hall

Exhibition Hall, The Forum

10:45 - 11:45

Keynote Addresses

*Enabling the Development of Ocean Energy**Liffey B*

11:45 - 13:00

Parallel Sessions

*1.1 Wave Energy Convertors**Liffey B**2.1 Ocean Energy Resource Assessment**Wicklow Hall 2A**3.1 Interactions with other sectors**Wicklow Hall 2B*

13:00 - 14:30

Lunch

Liffey A

Exhibition, Tea, Coffee & Biscuits

The Forum

14:30 - 15:45

Parallel Sessions

*1.2 Tidal Stream Technologies**Liffey B**2.2 Results of Environmental Impact Studies**Wicklow Hall 2A**3.2 OTEC and Salinity Gradient**Wicklow Hall 2B*

15:45 - 16:30

Coffee Break & Poster Session 1

Exhibition Hall, The Forum

16:30 - 18:00

Parallel Sessions

*1.3 Ports Vessels and Supply Chain**Liffey B**2.3 Measurement and Monitoring**Wicklow Hall 2A**3.3 Hybrid Systems**Wicklow Hall 2B*

18:00 - 20:00

Conference Welcome Reception

*Dublin Convention Centre - The Forum***THURSDAY, OCTOBER 18th**

08:30 - 10:00

Plenary Session

*Perspectives on the Commercialisation of**Ocean Energy**Liffey B*

10:00 - 11:00

Parallel Sessions

*1.4 Wave Energy Convertors**Liffey B**2.4 Test and Demo Facilities 1**Wicklow Hall 2A**3.4 Components, Moorings and Materials**Wicklow Hall 2B*

11:00 - 11:45

Coffee Break & Poster Session 2

Exhibition Hall, The Forum

11:45 - 13:00

Parallel Sessions

*1.5 International Perspectives on Ocean Energy**Liffey B**2.5 Test and Demo Facilities 2**Wicklow Hall 2A**3.5 Tidal Stream Technologies**Wicklow Hall 2B*

13:00 - 14:30

Lunch

Liffey A

Exhibition, Tea, Coffee & Biscuits

The Forum

Elevator Pitch Session (@13:40)

Exhibition Hall, The Forum

14:30 - 15:45

Parallel Sessions

*1.6 International Roadmaps**Liffey B**2.6 Site Investigation**Wicklow Hall 2A**3.6 Evaluation and Standards**Wicklow Hall 2B*

15:45 - 16:30

Coffee Break & Poster Session 3

Exhibition Hall, The Forum

16:30 - 18:00

Plenary Session

*Technology Overview and Panel Debate – The**Next Generation: Reducing Technology Costs**Liffey B*

19:00

Gala Dinner

*Trinity College Dublin***FRIDAY, OCTOBER 19th**

08:30 - 09:45

Plenary Session

*Financing Perspectives on the Development of**Ocean Energy**Liffey B*

09:45 - 11:00

Parallel Sessions

*1.7 Economics of Ocean Energy 1**Liffey B**2.7 Power Compliance and Grid Issues**Wicklow Hall 2A**3.7 Ocean Energy Device Arrays**Wicklow Hall 2B*

11:00 - 11:45

Coffee Break & Poster Session 4

Exhibition Hall, The Forum

11:45 - 12:45

Parallel Sessions

*1.8 Economics of Ocean Energy 2**Liffey B**2.8 Cables and Connectors**Wicklow Hall 2A**3.8 Permitting and Licensing**Wicklow Hall 2B*

12:45 - 13:30

Conference Closing Session

Liffey B

Wednesday 17th October

07.00 - 08.30

Registration

08.30 - 10.15

ICOE 2012 Conference Opening Session*Opening: Eoin Sweeney, Chair of the ICOE International Committee***Welcome & Chair: Dr Brian Motherway, CEO of SEAI**

Mr Pat Rabbitte, Minister for Communications, Energy and Natural Resources, Irish Government
 Mr Bernard Valcourt, Canadian Minister of State (Atlantic Canada Opportunities Agency)
 Ms Arlene Foster, Minister for Enterprise, Trade and Investment, Northern Ireland
 Mr Colin Imrie, Deputy Director and Head of Energy and International Low Carbon, Scottish Government

10.15 -10.45

Coffee Break & Exhibition

10.45 -11.45

Keynote Addresses - Enabling the Development of Ocean Energy*Chairs: Eoin Sweeney, Chair of the ICOE International Committee*

John Mc Sweeney, Head of Innovation, ESB - *Ocean energy, harnessing the potential*
 Eddie O'Connor, CEO Mainstream and Founding Member of Friends of the Supergrid -
Offshore Grid: the key enabler for marine renewables
 Sean Kidney, Climate Bonds Initiative - *Financing pathways for the marine renewable sector*

11.50 - 13.00

1.1 Wave Energy Convertors I*Chair: Kim Nielson, Ramboll, Denmark*

- Martin McAdam, Aquamarine - *The development of Aquamarine*
- Ali Baghaei, Oceanlinx Ltd - *The world's first 1MW wave energy convertor*
- Jonathan Fievez, Carnegie Wave Energy Ltd - *Progress towards the worldwide deployment of the CETO® Wave Energy Technology*
- Erik Friis-Madsen, WaveDragon - *The development of a Wave Dragon 1.5 MW North Sea Demonstrator*

2.1 Ocean Energy Resource Assessment*Chair: Prof Tony Lewis, HMRC University College Cork*

- Helen Smith, University Of Exeter - *Wave resource assessment for the Falmouth Bay wave energy test site (FaBTest)*
- Thomas Adcock, University Of Oxford - *On the tidal resource of the Pentland Firth*
- Shiaw-Yih Tzang, National Taiwan Ocean University - *Wave Energy Resources on Coastal Waters of Northeast Taiwan*
- Takashi Okamoto, Hiroshima University - *Wave Energy Resource in the Western Part of Japan*

3.1 Interactions with other sectors*Chair: Jochen Bard, Fraunhofer Institute, Germany*

- Laurent Marquis, Wave Star - *Introduction of WaveStar wave energy converters in the Danish offshore wind power plant Horns Rev 2*
- Alla Weinstein, Principal Power - *WindFloat and WindWaveFloat: A deepwater offshore renewables system*
- James Ryan, Aquavision - *Farming fish, waves and wind in the deep blue*
- Eduardo Quevedo, Plocan - *Modular multi-purpose offshore platforms: TROPOS's approach*

13.00 - 14.30

Lunch & Exhibition

14.30 - 15.45

1.2 Tidal Stream Technologies I*Chair: Peter Fraenkel, Fraenkel Wright Ltd*

- James Ives, OpenHydro - *Development of a tidal energy business*
- Oliver Wragg, Atlantis Resources Corporation - *Deployment and testing of the AR1000, a 1MW tidal stream turbine*
- Peter Kracht, Fraunhofer IWES - *Implementation of a Vertical Axis Marine Current Plant for Off-grid Village electrification in Indonesia*
- Sian Wilson, Black and Veatch - *Understanding the interactions of tidal power projects across the UK Continental Shelf*

2.2 Results of Environmental Impact Studies*Chair: Yago Torre-Enciso, EVE, Spain*

- Andrea Copping, Pacific Northwest National Laboratory - *Renewable Ocean Energy and the Marine Environment: Filling Gaps in Knowledge*
- Graham Daborn, Acadia Tidal Energy Institute - *Between Scylla and Charybdis : Designing Approaches to Environmental Assessment of In-Stream Tidal Power in High Flow Environments*
- Cuan Boake, Queen's University Belfast - *The Environmental Monitoring Programme related to Wake Effect of the Seagen Tidal Turbine*
- Mérin Broudic, Swansea University - *Long Term Monitoring of Underwater Noise at a Proposed Deployment site of a Tidal Stream Device*

3.2 OTEC and Salinity Gradient*Chair: Peter Davies, Ifremer, France*

- Paul Dinnisson, OTEC Foundation - *A collaborative effort*
- Frederic Le Lidec, DCNS - *DCNS roadmap on OTEC*
- Franck Rogez, Geocean - *Deep large seawater intakes : a common solution for Floating LNG in oil and gas industry and OTEC in marine renewable energy sector*
- Michael Papapetrou, WIP GmbH & Co Planungs - *Reverse Electrodialysis Power Production - Progress in the development of an innovative system*

15.45 - 16.30

Coffee Break, Poster Session 1 & Exhibition

16.30 - 18.00 1.3 Ports Vessels and Supply Chain

Chair: Barry Carruthers, Scottish Power Renewables

- Matthew Shanley, HMRC, UCC - *Offshore Wind Farm Service Vessel, Hull Design Optimisation*
- Jochen Bard, Fraunhofer IWES - *Offshore Supply Chain Requirements for Ocean Energy in Europe - Results from the ORECCA Project*
- Cera Slevin, ESB - *Supply Chain Needed for 5MW Wave Farm*
- Michael Shaw, RPS Group - *Port interaction with the marine renewable energy sector*
- Nick Murphy, Searoc - *Specialist construction & service vessels for the marine renewable energy sector*

2.3 Measurement and Monitoring

Chair: Prof A. Sarmento, Wave Energy Centre, Portugal

- Brandon Strong, University Of Exeter - *Wave measurements near the Wave Hub using a 5-Beam ADCP*
- Raymond Alcorn, HMRC, UCC - *Lessons learned from the Galway Bay Seatrials of the EU FP7 funded CORES project.*
- Harry Kolar, IBM - *Real-time acoustic monitoring for the ocean energy industry*
- Jean-Baptiste Richard, Fraunhofer IWES - *Assessing the capabilities of acoustic Doppler sensors for quantifying dynamic phenomena in tidal streams*
- Mat Thomson, GL GarradHassan - *Comparison of scale model wake data with an energy yield analysis tool for tidal turbine farms*

3.3 Hybrid Systems

Chair: Gerardo Hiriart, Mexico

- Israel Martinez, Acciona - *Methodology for assessing multiple combined wind and ocean energy technologies as part of the EU FP7 MARINA Platform Project*
- Katie Lynch, HMRC, UCC - *Site Selection Methodology for combined wind and ocean energy technologies in Europe*
- Carlos Pérez, Universidad De Santiago De Compostela - *Integration of Wave Energy Convertors and Offshore Windmills*
- Antoine Peiffer, Marine Innovation and Technology - *Design of an oscillating wave surge convertor on the Windfloat structure*
- Franklin Martin, FloatInc - *Offshore Wind and Wave Together - AFloat*

18.00 - 20.00

Conference Welcome Reception - Dublin Convention Centre
Welcome from the Deputy Lord Mayor of Dublin, Cllr. Clare Byrne

Thursday 18th October

08.30 - 09.45

Plenary Session: Perspectives on the Commercialisation of Ocean Energy

Chair: John Huckerby, OES & AWATEA, New Zealand

David Ainsworth, Siemens - *Cost down: Solving the challenge of successful commercialisation*
 Barry Carruthers & Roberto Veguillas Perez, Iberdrola - *Developing a Business in Marine Renewable Energy*
 Peter Wesslau, Vattenfall - *The need for a mature commercial value chain*

09.50 - 11.00 1.4 Wave Energy Convertors II

Chair: Marc Le Boulluec, Ifremer, France

- Enrique Vidal Sanchez, Wavestar - *Early Performance Assessment of the Electrical Output of Wavestar's prototype*
- Simon Ambuehl, Aalborg University - *Reliability Assessment of Wave Energy Devices*
- Keyyong Hong, Kordi - *Distinctive Technologies Applied to Yongsoo Pilot Plant of 500kW OWC Wave Energy Converter*
- Clym Stock-Williams, E.ON - *Lessons from the Pelamis Deployments at EMEC*

2.4 Test and Demo Facilities I

Chair: Jose Luis Villate, Tecnalia, Spain

- Yago Torre-Enciso, EVE - *Mutriku: First year review*
- Eileen Linklater, EMEC - *Innovation in action - EMEC update on learning from 11 marine energy convertors in Orkney*
- Yann-Herve De Roeck, Ifremer - *France Energies Marines offers a coordinated panel of sea-trial test sites*
- Claire Gibson, Wave Hub Ltd - *Responding to the challenge of deploying a commercial array*

3.4 Components, Moorings and Materials

Chair: David Bell, Invest Northern Ireland

- Sam Weller, Ifremer - *Durability of synthetic mooring lines for ocean energy devices*
- Jeffrey Steynor, Edinburgh University - *A Design Tool for the Wear Pattern and Thermal Response of Plain Bearings Submersed in Sea Water*
- Paul McEvoy, Technology From Ideas Ltd - *Combined Elastomeric & Thermoplastic Mooring Tethers*
- Yukio Kamizuru, Bosch Rexroth AG - *Efficient Hydraulic Power Take-Offs for Ocean Energy Devices*

11.00 - 11.45

Coffee Break, Poster Session 2 & Exhibition

11.45 - 13.00 1.5 International Perspectives on Ocean Energy

Chair: Nathalie Rousseau, EU-OEA

- Henry Jeffrey, University of Edinburgh - *European Energy Research Alliance Joint Programme on Ocean Energy*

2.5 Test and Demo Facilities II

Chair: Ana Brito e Melo, Wave Energy Centre, Portugal

- Mark Healy, HMRC, UCC - *MARINET Free access to test facilities: How Europe's leading research centres have joined forces to accelerate the development of marine renewable energy*

3.5 Tidal Stream Technologies II

Chair: Dr Keyyong Hong, KORDI, Korea

- Chris Sauer, ORPC - *Making History: Launching the First Commercial Tidal Energy Project in the United States*
- Luke McEwen, Gurit - *Cost-effective tidal turbine blades*

11.45 - 13.00

- Dengwen XIA, State Oceanic Administration (SOA) and Administrative Centre for Marine Renewable Energy (ACMRE), People's Republic of China - *The activities of marine renewable energy in China*
- Chris Campbell, Canada - *Turning potential into reality - creating an industry out of an iconic resource*
- Mike Reed, DoE USA - *Recent US efforts to advance marine hydrokinetics*
- Jose Luis Villate, Tecnalia & OES - *Ocean energy activities in Spain and vision of the OES*

- Javier Marques EVE - *Lessons learnt and future steps towards the exploitation of BIMEP*
- Anna Redden, FORCE - *The Importance of Tidal Demonstration facilities in Advancing Technology Development - A Fundy Ocean Research Centre for Energy (FORCE) Perspective*
- Terence Browne, CEI Collins Engineers Ltd - *Overview of the ASCE COPRI Marine Renewable Energy Facilities Guide Document*

- Cheng-Han Tsai, National Taiwan Ocean University - *Tidal power potential and the Development and testing of a Tidal Stream device for the sea near Keelung, Taiwan*
- Adam Holland, McLaughlin & Harvey - *The route to commercially viable foundation installation and deployment of wave and tidal devices*
- Stephen Salter, University Of Edinburgh - *Are nearly all Tidal Stream Turbines Designs Wrong?*

13.00 - 14.30

Lunch & Exhibition

Elevator Pitch Session (in Exhibition Hall)

CyanWave WEC - Tim Morrissey, Cyan Technologies

The DUO - Paul Brewster, Pure Marine

Sea Power Platform - Ben Wrafter, Sea Power Ltd

An active-controlled submerged wave energy device with energy focussing - Umesh Korde, South Dakota School of Mines and Technology and R. Cengiz Ertekin, University of Hawaii

Eco Wave Power - David Leb, Eco Wave Power Company

14.30 - 15.45

1.6 International Roadmaps

Chair: Henry Jeffrey, Edinburgh University, UK

- Nathalie Rousseau, EU-OEA - *European Initiatives for Ocean Energy*
- Soraya Hamawi, Wave Energy Centre - *Wave Energy in Portugal, the path towards successful implementation*
- Bruce Cameron, Nova Scotia Department of Energy - *Nova Scotia's Integrated Strategy for Marine Renewable Energy Development*
- Joaquin Hernandez, Canary Islands - *Vision for marine renewables in the Canary Islands*
- Kyung Hwa Song, Korea Institute of Marine Science and Technology Promotion - *Policy and Roadmap of Ocean Energy R&D in Korea*

2.6 Site Investigation

Chair: Javier Marques, EVE, Spain

- Harold McClenahan, Commissioners Of Irish Lights - *Navigational Marking of Offshore Renewable Energy Extraction Sites*
- Brian Polagye, University Of Washington - *Multi-scale tidal resource characterisation: A case study for Admiralty Inlet, Puget Sound*
- Patricio Monardez, Baird & Associates - *Wave energy map in intermediate and shallow water depth in Chile based on a 30 year long validated 2D spectral hindcast of the Pacific Ocean*
- Richard Karsten, Acadia University - *Analysis of Tidal Turbine Arrays in Digby Gut and Petit Passage, Nova Scotia*

3.6 Evaluation and Standards

Chair: Claudio Bittencourt, Det Norske Veritas, UK

- Neil Rondorf, SAIC & Chairman IEC TC-114 - *Standards: Value added in development and commercialisation*
- Matt Folley, Queens University Belfast - *Standardising resource assessment for wave energy converters*
- Frank Fortune, Royal Haskoning - *An environmental perspective on project risk management in the wave and tidal sector*
- John Fitzgerald, ESB - *Technology Readiness for Wave Energy Projects; ESB and Vattenfall classification system*
- Jochem Weber, Wavebob - *WEC Technology Readiness and Performance Matrix - finding the best research technology development trajectory*

15.45 - 16.30

Coffee Break, Poster Session 3 & Exhibition

16.30 - 18.00

Plenary Session:

Chair: Chris Campbell, OREG, Canada

An overview of recent developments and trends:

Peter Fraenkel, Fraenkel Wright Ltd - Tidal Stream Turbine Sector

Max Carcas - Wave Energy Converter Sector

Panel Debate – The Next Generation: From prototyping devices to prototyping an industry

18.00

End of the Second Day of Conference

19.00

Gala Dinner - Trinity College Dublin (See map on page 32)

Friday 19th October

08.30 - 09.45

Plenary Session: Financing Perspectives on the Development of Ocean Energy

Chair: Tom Kelly, Enterprise Ireland

Miguel Marques, Economy of the Sea Executive Partner at PricewaterhouseCoopers
 Garrett Monaghan, Arthur Cox - *Access to project finance for ocean energy projects*
 David Walker, European Investment Bank - *Financial instruments for the ocean energy sector*
 David Krohn, Renewables UK - *Removing the barriers: making the most of our global resource*

09.50 - 11.00

1.7 Economics of Ocean Energy I

Chair: Peter Coyle, Marine Renewable Industry Association, Ireland

- Gordon Dalton, HMRC, UCC - *Impact of inter-annual resource data variability on techno-economic performance of the WaveStar*
- Mirko Previsic, RE Vision Consulting - *Lifecycle Cost and Supply Curves of Marine Technologies in the U.S.*
- Marc Paish, Pulse Tidal - *Are 1MW tidal systems big enough?*
- Iain Fairley, Swansea University - *A consideration of the deployment of wave energy converters in Welsh waters based on resource and financial considerations*

2.7 Power Compliance and Grid Issues

Chair: Roberto Veguillas Perez, Iberdrola, Spain

- Fergus Sharkey, ESB - *Voltage Flicker Evaluation for Wave Energy Converters - Assessment Guidelines*
- Andrea Mansoldo, Eirgrid - *Wave, Tidal and Grid Connection: Opportunities for an Irish Offshore West Grid*
- Julia Fernandez Chozas, Aalborg University - *Economic Evaluation of Integrating Wave and Wind Power Productions in Day-Ahead Electricity Markets*

3.7 Ocean Energy Device Arrays

Chair: Antonio Falcao, Instituto Superior Técnico, Portugal

- Pierpaolo Ricci, Tecnalia - *A methodology for the global evaluation of Wave Energy Array Performance*
- John Callaghan, Crown Estate - *Leasing for OE Arrays*
- Donal O'Sullivan, Bord Gais Energy - *Consenting and developing the first commercial arrays*
- Aurélien Babarit, Ecole Centrale de Nantes & WECAN - *Review of the park effect in arrays of wave energy convertors*

11.00 - 11.45

Coffee Break, Poster Session & Exhibition

11.45 - 12.45

1.8 Economics of Ocean Energy II

Chair: Mike Reed, Department of Energy, USA

- Borja De Miguel, Oceantec Energias Marinas - *New perspectives on the long term feasibility of wave energy conversion: a techno-economical approach*
- Alex Raventos, WavEC - *Techno-economic tool for WEC design optimization*
- Anne Van Houten, Bluewater - *Reducing the cost of ocean energy*
- Ronan Costello, NUI Maynooth - *Techno-Economic Optimisation for Wave Energy Converters*

2.8 Cables and Connectors

Chair: Neil Rondorf, SIAC, USA

- Peter Weiss, Powersea - *Novel wet-mate connectors for high voltage and power transmissions of ocean renewable energy systems*
- Florence Lafon, EDF - *Hydrodynamic loads on Paimpol-Bréhat tidal current array export cable*
- Steve Dymond, J&S - *EMEC subsea connection*
- Anthony Zymelka, Subsea Cables UK - *SCUK Guideline 6: Proximity of offshore windfarms to existing subsea cables*

3.8 Permitting and Licensing

Chair: Sean O'Neill, OREC, USA

- Anne Marie O'Hagan, HMRC, UCC - *A review of international consenting regimes for marine renewables: are we moving towards better practice?*
- Julie Ascoop, Arup - *Stakeholder input into the design of the Atlantic Marine Energy Test Site*
- Alice Whittaker, Philip Lee Solicitors - *Integrating Marine and Land-Based Planning Regimes - Facilitating and Protecting Offshore Energy and Cable Infrastructure*
- Teresa Simas, Wave Energy Centre - *Understanding the role of stakeholders in the wave energy consenting process: engagement and sensitivities*

12.45-13.30

Conference Closing Session

Kate Freeman, INORE - *INORE: knowledge exchange across borders and amongst young researchers*
 Best Poster Awards

Matthew King, DG Maritime Affairs and Fisheries, European Commission -
 EU Perspectives on Ocean Energy - the Atlantic Strategy and the new Horizon Programme

Conference Closing Remarks - Eoin Sweeney, Chairman of the ICOE International Committee

Grab-n-Go Lunch

Saturday 20th October

Guided Tour to OpenHydro, Greenore, Co. Louth & MCT SeaGen, Strangford Lough

views & vision

1 in 4 of the world's full scale marine energy prototypes have been developed, tested or manufactured in Northern Ireland.

Northern Ireland is known for its lush countryside and wonderful views, but did you know we also design and build the latest in renewables technology?

Impressive centres of excellence are at the forefront of research and development and have unbeatable technical knowledge.

We also offer competitive operating costs, a first-rate business infrastructure, and generous financial assistance and support.

To learn more about what makes Northern Ireland the smart choice, visit www.investni.com/invest or visit us during ICOE on stand 7a.



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Northern **Ireland**
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In order of appearance

DAY 1 - WEDNESDAY 17th



John McSweeney Head of Innovation, ESB

John McSweeney was recently appointed as Head of Innovation ESB, having served as Acting Executive Director of ESB Energy International in 2011. He previously held senior positions as Manager of ESB Asset Development, Manager of Engineering and Facility Management at ESB International and Manager of ESB IT Solutions and Telecoms. A Physics Graduate and Mechanical Engineer, John joined ESB in 1992. Prior to his career in the energy sector, he held senior positions in the Irish Industrial Development Authority including Director of Germany, and is a former Irish Army Officer.



Dr. Eddie O'Connor Founder and Chief Executive, Mainstream Renewable Power

Eddie was named World Energy Policy Leader by Scientific American magazine in 2003. In February 2008, Dr Eddie O'Connor founded Mainstream Renewable Power. Previously he was the Founder and Chief Executive of Airtricity from 1997 until January 2008, when the company was sold to E.ON and Scottish & Southern Energy for approximately €2 billion. Eddie is acknowledged as the driving force behind the European Offshore Supergrid. This vision and activity will, when built, guarantee European energy self-sufficiency as well as producing carbon free electricity.



Sean Kidney Co-founder and Chair, Climate Bonds Initiative

The Climate Bonds Initiative is an investor-focused NGO working to mobilize capital markets to fund a rapid, global transition to a low-carbon economy. It recently launched an International Standards and Certification Scheme for climate bonds; investor groups representing \$10 trillion AUM sit on its board. The Initiative also promotes public sector guarantee schemes for renewable energy and public transport; green investment banks; and "sustainable financial solutions" for large-scale residential energy efficiency schemes. Sean is a member of the UK Government's Capital Markets Climate Initiative and a director of the Network for Sustainable Financial Markets. He was previously marketing advisor to a number of the largest Australian pension funds and a social marketer and publisher.

DAY 2 - THURSDAY 18th



David Ainsworth Business Development Director – Marine Current Turbines, Siemens

David Ainsworth has a degree in Aeronautics & Astronautics from the University of Southampton and is a Chartered Engineer (C.Eng., Eurlng, MRAeS). He has nearly 30 years of experience of delivering R&D projects, initially in the aerospace sector where he was involved in designing hydraulic systems and gas turbines for numerous aerospace applications. David joined MCT in 2003 and has been responsible for programme management, project development, consenting and grant applications for SeaGen in Strangford and all other MCT projects. He now heads the Business Development team in MCT which also includes the project development group.



Barry Carruthers Marine Development Engineer – Scottish Power Renewables

Barry is the Marine Development Engineer at Scottish Power Renewables. Focusing on the wave and tidal sector, he works on all aspects of marine project development from site and technology evaluation, to balance of plant and project financing. Through the pioneering sector activities in Scotland, ScottishPower Renewables works closely with colleagues in Iberdrola in order to develop the global marine energy business strategy for the years ahead.



Roberto Veguillas Head of Technology Innovation – Iberdrola

Roberto Veguillas is Industrial Engineer with the Universidad Politécnica de Madrid. He also undertook the Executive MBA from the EOI Business School of Madrid, the Superior Program in Project Management from the IE Business School of Madrid and the Master in Energy Business from the ENERCLUB of Madrid. He joined Iberdrola in 2006, and worked in several positions related with the construction of electrical infrastructures worldwide. Currently, he is Head of Technology Innovation in the Renewables Business Unit of Iberdrola, leading the R&D activities and the technological perspective of the business. Since 2001, he also worked for Unión Fenosa, ABB and AREVA T&D.



Peter Wesslau UK Country Manager, Vattenfall

As UK Country Manager for Vattenfall, Peter represents Vattenfall's activities in the UK, including 590MW of on and offshore wind generation, a 7.2GW development portfolio of offshore wind in partnership with Iberdrola and early stage developments in ocean energy and subsea interconnection. Peter has more than 15 years of professional management experience at Vattenfall, recently as head of Strategic and Finance spearheading Vattenfall's Europe-wide wind strategy. Peter graduated from the Stockholm School of Economics.



Peter Fraenkel Partner, Fraenkel-Wright Ltd.

Peter Fraenkel is a partner in Fraenkel-Wright Ltd, a consultancy business specialising in renewable energy and focussing on marine applications. Peter has taken a prominent role in the promotion of tidal current energy for some 20 years, having been a founder and Technical Director until March 2012 of the pioneering tidal turbine company, Marine Current Turbines Ltd, now owned by Siemens. He is a Chartered Mechanical Engineer, a Fellow of the Institution of Mechanical Engineers, a Fellow of the Energy Institute and he is also a Visiting Professor at the University of Edinburgh.



Max Carcas Managing Director, Caelulum Ltd

Max has many years' experience in offshore renewables. He is founder of Caelulum Ltd, a company providing strategic advice to the offshore renewables market and economic modelling of offshore wind, wave and tidal projects. He also represents EMEC in its external relations, supporting its customers and stakeholders and helping to develop its strategy for the future.

Prior to this he was Business Development Director at Pelamis Wave Power where he was instrumental in raising >£70m of investment, sales and grants, securing customers including E.ON, Iberdrola/Scottish Power Renewables, Babcock & Brown and creating joint ventures with Vattenfall and EDP.

DAY 3 - FRIDAY 19th



Garrett Monaghan, Partner, Energy & Projects Group - Arthur Cox

Garrett is a Partner in the Arthur Cox Projects and Energy Group; Arthur Cox is a leading "all island" Irish law firm with offices in Dublin, London, Silicon Valley and New York. Garrett's practice areas are primarily project finance, energy trading, M&A and private equity and has advised on the development, financing, acquisition and operation of multiple renewables assets including onshore & offshore wind, CHP, biomass, wave and waste to energy transactions. Garrett is recognised as one of the most active renewables and project finance lawyers in Ireland. Garrett is a member of the policy committee of the Irish Wind Energy Association.



David Walker Senior Investment Manager, European Investment Bank (EIB)

David works in the Climate Change and Environment Division within the EIB, where he has particular responsibility for investment in renewable energy and environment-related infrastructure funds. Prior to joining EIB he worked at the European Investment Fund (EIF), investing in the early stage, venture capital and private equity sectors in Europe. With overall some 18 years of private equity investment experience, he has also worked in the economic development field for Scottish Enterprise, and for the London Stock Exchange, where he was part of the team which set up the AiM market for smaller companies.



David Krohn Wave and Tidal Energy Development Manager, Renewables UK

After completing a BSc in Environmental and Geographical Science and an MPhil in Environmental and Marine Pollution Law, David worked for the Construction Industry Research and Information Association concentrating on Nuclear Decommissioning and major infrastructure projects. Since joining RenewableUK, he has coordinated and executed the association's policy work. This has included work around the Renewables Obligation banding, shaping the upcoming Electricity Market Reform and clarifying the situation around consenting and access to the grid. He participates in various wave and tidal energy forums and currently sits on the Marine Energy Programme Board, the European Ocean Energy Association's Board of Directors and the Offshore Renewable Energy Licensing Group amongst others.



Miguel Marques Economy of the Sea Executive Partner, PricewaterhouseCoopers

Miguel Marques is the Economy of the Sea Executive Partner at PricewaterhouseCoopers Portugal and a member of the PricewaterhouseCoopers Economy of the Sea Global Team. Since he completed the degree in Economics at Porto University he has been working at PricewaterhouseCoopers as advisor of multinational companies related with several industries, including renewable energy. Miguel has worked with leaders and executives across Europe, The Americas and Asia in order to help them make the best business decisions. Miguel is the author of HELM – PwC Economy of the Sea Barometer (Portugal), a compilation of data that allows, a better understanding of the evolution of the economy of the sea.



Working for a sustainable energy future

ESB International operates at the forefront of the renewable energy sector, providing engineering, strategic and environmental expertise to support wind and ocean energy projects at commercial and pre-commercial stages of development.

With experience working across a range of wind, wave and tidal generation technologies and a 35 year track record managing major electricity generation and transmission projects, we offer a range of specialist services to ensure the successful delivery of your energy project. Our services include:

- Site Selection and Evaluation
- Environmental Impact Assessments
- Power Systems Studies
- Licensing & Permitting Documentation
- Technology Evaluation
- Grid Connections
- High Voltage Submarine Cables
- Operations & Maintenance Services
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With over 150 years of experience in power generation, transmission and distribution, Siemens provides excellent

energy-efficient technologies to meet the world's growing need for clean, sustainable energy. Our comprehensive portfolio includes technologies that use a variety of fuels, from fossil fuel to renewable energy sources. We are constantly seeking and researching new and better technologies to solve future energy challenges.

The world needs answers that last. Siemens provides them today.

WEDNESDAY OCTOBER 17th
 15.45 - 16.30 - Exhibition Hall

Session 1: Posters on Wave Energy Convertors, Hybrid Systems, Moorings and Foundations

No.	Name	Institution	Poster Title
1.1	Violette Harnois	University Of Exeter	Physical measurement of a slow motion of a drag embedment anchor during sea trials
1.2	Luca Pietra	Centro De Engenharia E Tecnologia Naval Instituto Superior Tecnico	Numerical modelling of the power take off for the UGEN floating wave energy converter
1.3	William Finnegan	NUI Galway	The Structural Dynamics of a Two-Body Wave Energy Converter
1.4	Lucia Margheritini	University of Bologna	Proof of concept for new power buoy with pivoting arm LOPF
1.5	Elisa Angelelli	University Of Bologna	Numerical modelling of the hydrodynamics around the farm of WAB
1.6	Michael Livingstone	GL Garrad Hassan	Development of a wave energy converter (WEC) design tool - application to the Waveroller WEC including validation of numerical estimates
1.7	Bruno Borgarino	Eosea	A preliminary study of the hydro-elastic modelling of the WaveStar wave energy converter
1.8	Boris Fischer	Fraunhofer IWES	Online-Algorithm using Adaptive Filters for Short-Term Wave Prediction and its Implementation
1.9	Vladimir Krivtsov	Heriot-Watt University	Measurements of WEC motions and mooring loads
1.10	Pauline Laporte Weywada	GL Garrad Hassan	Development of a wave farm planning tool - preliminary verification of a wave energy converter array model in the spectral-domain
1.11	Raul Gaunche	IH Cantabria	Towards the development of a time-domain numerical model of a floating multi-chamber OWC wave energy extraction device
1.12	Augustin Garcia Santana	University Of Seville	Frequency-matching assessment under reactive control on wave energy converters
1.13	Wanan Sheng	HMRC, University College Cork	On the Primary Wave Energy Conversion of Oscillating Water Column Devices
1.14	Julia Fernandez Chozas	Aalborg University	Combined Production of a full-scale Wave Converter and a full-scale Wind Turbine - a Real Case Study
1.15	Garret Brady	Institute Of Technology Blanchardstown	Design and construction of a linear switched reluctance generator for use in wave-energy applications
1.16	Rui Gomes	Idmec-Ist	Testing of a small-scale floating OWC model in a wave flume
1.17	Jan Erik Hanssen	Tecnalia	Combined offshore renewable energy converters: Progress of the EU project "MARINA Platform"
1.18	Luis Gato	Instituto Superior Tecnico	Model testing of a novel radial self-rectifying air turbine for use in OWC wave energy converters
1.19	Chen Chou Lin	National Taiwan Ocean University	The Experimental Investigation of The Influencing Parameters of Flap-Type Wave Energy Converters
1.20	Pierpaolo Ricci	Tecnalia	Design, Modelling and Analysis of an Integrated Mooring System for Wave Energy Arrays
1.21	Ignacio Cobo	CT Innova	Direct Drive Wave Energy Conversion System for the Seaquest Concept
1.22	Julio Rodriguez	University Of Victoria	Design and Evaluation of a Unidirectional Flow Collective Air Pumps Wave Energy Converter

THURSDAY OCTOBER 18th
11.00 - 11.45 - Exhibition Hall

Session 2: Posters on Tidal Devices and Site Investigations

No.	Name	Institution	Poster Title
2.1	Jamie Grimwade	Narec	Structural Testing Requirements for Tidal Stream Blades
2.2	Aishwarya Moni Coffey	University College Dublin	Towards ocean wave energy-potential quantification from a terrestrially-based seismic observation system
2.3	Joana Van Nieuwkoop-McCall	University Of Exeter	Evaluation of wave energy resource versus extreme wave conditions at different water depths
2.4	Ciaran Kennedy	NUI, Galway	Fatigue life of glass fibre reinforced polymer composite tidal turbine blades
2.5	Brendan Cahill	HMRC, University College Cork	Resource Variability and Extreme Wave Conditions at the Atlantic Marine Energy Test Site
2.6	Barbara Proenca	University Of Plymouth	Initial Evaluation of a WERA HF Radar as a Resource Assessment Tool for Wave Energy
2.7	Paul Evans	Cardiff University	Monitoring Hydrodynamics for Mapping and Modelling
2.8	Darren Coppinger	Ryan Institute, NUIG	Three-dimensional Modelling of the Hydrodynamic Effects of Tidal Turbines
2.9	Sian Tedds	University Of Liverpool	Wake characteristics of Horizontal Axis Tidal Stream Turbines in uniform and non-uniform steady flows
2.10	David Fallon	Ryan Institute, NUI Galway	The Effects of Array Configuration on the Hydro-environmental Impacts of Tidal Turbines
2.11	Marta Gonzales	Ist-Centre	Evaluation of the Wave Energy Resource in the Western French Coast
2.12	Laura Serri	Rse	Offshore Renewable Resources in EUROPE: the ORECCA Project and WebGIS
2.13	Valentina Vannucchi	Universita Di Firenze, Dipartimento Di Ingegneria Civile E Ambientale	Estimation of the offshore wave energy potential of the Mediterranean Sea and propagation toward nearshore areas
2.14	Ian Masters	Swansea University	A Modified k-epsilon Turbulence Model for Tidal Stream Turbine Simulations Using a Coupled BEM-CFD Model
2.15	Simon McIntosh	University Of Oxford	The Influence of Vertical Velocity Shear on Tidal Turbine Performance and Wake Recovery
2.16	Enayatollah Zangiabadi	Swansea University	Characterisation of the Coastal Hydrology of Oceans Using 3D Computational Fluid Dynamics
2.17	Michael Togneri	Swansea University	Comparison of marine turbulence characteristics for some potential turbine installation sites
2.18	Duncan Sutherland	University Of Edinburgh	Site Characterisation using Acoustic Sensor Arrays Installed on a Commercial Scale Tidal Turbine
2.19	Justine McMillan	Acadia University	Validation of High Resolution Numerical Model Tidal Currents
2.20	Abhinaya Sankaran Iyer	University Of Edinburgh	Quantifying the Impact of Tidal Current Energy Variability and Matching UK Demand
2.21	Joel Culina	Acadia University	The effect of sea-bed drag on power potential
2.22	Lucy Cradden	University Of Edinburgh	A combined resource atlas for marine energy
2.23	Thomas Furey	Marine Institute	Energy From The Bottom Up
2.24	AbuBakr S. Bahaj	University of Southampton	Energy yield differences between fixed-orientation and yawing tidal turbines at the Fall of Warness

THURSDAY OCTOBER 18th

15.45 - 16.30 - Exhibition Hall

Session 3: Posters on Test Facilities, Measurement and Monitoring and Installation Issues

No.	Name	Institution	Poster Title
3.1	Michael O'Connor	HMRC, University College Cork	Weather window analysis incorporating wave height, wave period, wind speed and tidal current with relevance to deployment and maintenance of marine renewables
3.2	Peter Robins	Bangor University	The impact of tidal energy extraction on the morphodynamics of the Irish Sea
3.3	Michael Hartnett	NUI Galway	Ocean energy numerical modelling and experimental testing facilities at the National University of Ireland, Galway
3.4	Simon Neill	Bangor University	Impact of WEC array operation on nearshore processes
3.5	Gregory Pinon	University Of Le Havre	Numerical modelling of horizontal axis marine current turbine arrays
3.6	Glenn Nolan	Irish Marine Institute	Oceanographic service provision to Ireland's emerging ocean energy sector
3.7	Ruth De Silva	Bio3	Portuguese offshore renewables Pilot Zone - producing environmental guidelines for development
3.8	Mat Thomson	GLGarradHassan	Full-scale validation of a numerical tool for the prediction of the hydrodynamic performance of axial flow tidal turbines
3.9	John O'Callaghan	HMRC, University College Cork	Technical and Practical Guidance for Conducting Sea Trials at Galway Bay Wave Energy Test Site
3.10	Paul Gaughan	Marine Institute	The Future Internet: A Marine Renewable Sector's View
3.11	Pedro Liria	Azti Tecnalia	Operational oceanography services in the Biscay Marine Energy Platform: BIMEP
3.12	Miguel Santos	Wedge Global S.L.	Testing of a full-scale PTO based on a Switched Reluctance Linear Generator for Wave Energy Conversion
3.13	Vincent Neary	Oak Ridge National Laboratory	US Department of Energy National Lab Activities in Marine Hydrokinetics: Machine Performance Testing
3.14	Morten Kramer	Wave Star	Comparison between linear numerical models and experimental results on a Wavestar point absorber
3.15	Thomas Davey	FloWave TT Ltd	The All-Waters Test Facility - a new resource for the marine energy sector
3.16	Jochen Bard	Fraunhofer IWES	Research activities in the MaRINET project: keeping the European marine energy development facilities at world class level
3.17	Mike Devane	Marine Institute	SmartBay Ireland: Leveraging State Infrastructure to create enterprise
3.18	Ann Marie Downey	ESBI	Coastal Process Impact Assessment for the Atlantic Marine Energy Test Site (AMETS)
3.19	Davide Magagna	Plymouth University	Development of a Data Management Platform of the integration of European Wave Energy Impact Assessment datasets
3.20	Lisa Isaacman	Fundy Energy Research Network	The Fundy Energy Research Network: Fostering Tidal Energy Research Collaborations in the Bay of Fundy, Canada
3.21	Brian Flannery	HMRC, University College Cork	An Assessment of the Performance of a Point Absorber Restricted to Heave Motions Only
3.22	Timothy Poate	Plymouth University	Assessment of Potential Morphodynamic Response to Wave Hub

FRIDAY OCTOBER 19th
11.00 - 11.45 - Exhibition Hall

Session 4: Posters Financing and Economics, Power, Grid and Environmental Issues

No.	Name	Institution	Poster Title
4.1	Clym Stock-Williams	E.On	Quantifying the Potential Global Market for Wave Power
4.2	Anne Blavette	HMRC, University College Cork	Grid Impact of a Wave Farm: Analysis at Different Connection Points in Ireland
4.3	Ralf Bucher	University Of Edinburgh	De-risking utility-scale marine energy investments by extending the regular project implementation by a competitive technology qualification routine
4.4	Audrey Journoud	DCNS/PIMENT Laboratory	Experimental Ocean Thermal Energy Conversion (OTEC) project in French overseas departments
4.5	Fergus Sharkey	ESB	Practical Analysis of Key Electrical Interfaces for Wave Energy Converter Arrays
4.6	Ralf Starzmann	University Of Siegen	Aero-Acoustic Analysis of the Wells Turbine with Guide Vanes
4.7	Sofia Matias	Idmec	Roadmapping Ocean Energies: Uncertainties Review and Assessment
4.8	Brian Holmes	HMRC, University College Cork	Is Wave Energy Development as Confused as a Stormy Sea Surface? Funding must be made available to encourage and allow engineers to finish developing operational devices
4.9	Vidina Monagas	The Oceanic Platform Of The Canary Island (PLOCAN)	An Electrical Grid Connection in PLOCAN Testbed to support new marine technologies
4.10	Gregorio Iglesias	Univ. Of Santiago De Compostela	To what extent should tidal power peaks be exploited? A cost sensitivity analysis
4.11	Pablo Ruiz-Minguela	Tecnalia	Design, Modelling and Analysis of a Submarine Electrical & Data Socket for Marine Energy Arrays.
4.12	Dara O'Sullivan	HMRC, University College Cork	Case studies on the benefits of energy storage for power quality enhancement: oscillating water column arrays
4.13	Juan Bald	AZTI-Tecnalia	The Biskay Marine Energy Platform (BIMEP), environmental impacts and monitoring plan
4.14	Micheal O'Cathain	SSER	Towards increased confidence in wave and tidal energy production estimates
4.15	Keith O' Sullivan	HMRC, University College Cork	Deterministic Economic Model for Wind-Wave Hybrid Energy Conversion Systems
4.16	Paddy Kavanagh	ESB International	Environmental Impact Assessment of two Ocean Energy Projects in Ireland
4.17	Darren Mollaghan	University College Cork	SEAGRID: A New Dynamic Modelling Tool for Power System Analysis of Ocean Energy Devices
4.18	Patrick O'Rourke	ESBI	Design methodology and survey investigations required for the Atlantic Marine Energy Test Site and the WestWave pilot wave energy project.
4.19	William Kingston	Trinity College Dublin	Hydrofoils for economical turbine anchoring
4.20	Greg Trowse	Dalhousie University	At the End of the Line: Approaches for Adding Renewable Energy to Rural Maritime Communities
4.21	Dan Maher	Nua Venture	Ireland's Smart Ocean - Emerging Innovation Cluster
4.22	Tim Persoons	Trinity College Dublin	Feasibility Study and Cost-Benefit Analysis of Tidal Energy: A Case Study for Ireland

ICOE 2012 ON THE RIVER

The location and venue for ICOE 2012 is truly unique with its proximity to the River Liffey. Delegates will be able to visit the various vessels which are berthed on the North and South side of the Quays for ICOE 2012. Tours and demonstrations will take place on these vessels.

VESSELS AND KIT AT ICOE 2012

Island Shipping – Island Kestrel



Geological Survey Ireland - RV Keary

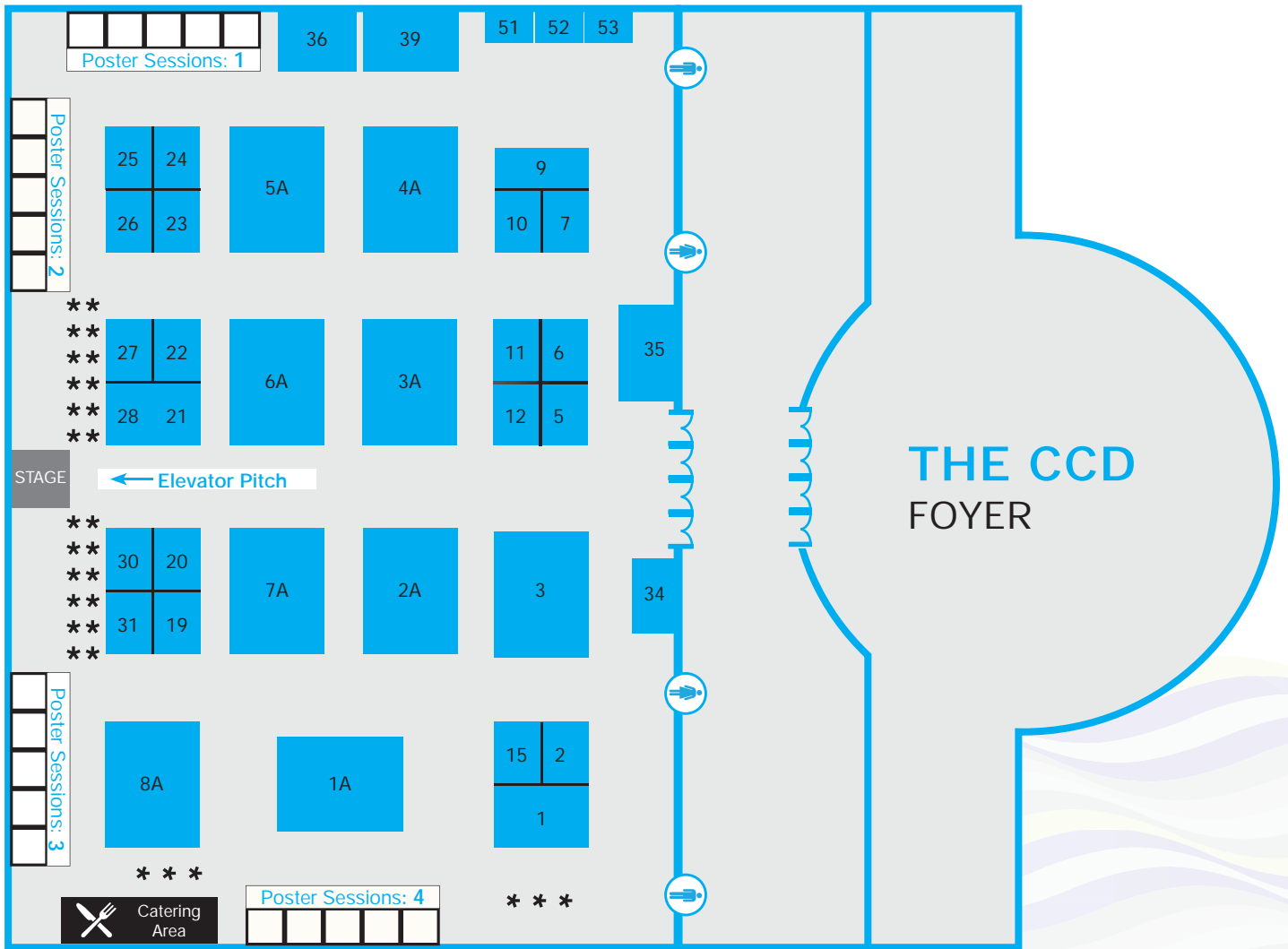


Marine Institute – Celtic Voyager



Naval Services - L.E Roisin





KEY

- Stand Numbers
- Pod Tables

Poster Sessions 1: Wed. AM (17/10/12)

Poster Sessions 2: Thu. AM (18/10/12)

Poster Sessions 3: Thu. PM (18/10/12)

Poster Sessions 4: Fri. AM (19/10/12)

Basque Country	8A	Hydrocean	31	Open Hydro Technology Ltd.	6A
Blue Power	30	Idénergie	52	Parker	35
Bosch Rexroth	39	IFREMER	2	Planet Ocean Ltd	5
Danish Wave Energy Centre	22	IMERC	6	Royal Haskoning	23
DCNS	5A	INFOMAR	11	Scottish Development International	4A
Enterprise Ireland	2A	Invest Northern Ireland	7A	Sustainable Energy Authority of Ireland	3
Environment and Energy Management	19	IT Power & Fraunhofer IWES	7	Techworks Marine	53
ESB	21-28	JFC Manufacturing	26	University of Edinburgh / FloWave TT	9
EU-OEA	34	Jospa	51	Vattenfall	15
France Energies Marines	1	Marine Institute Plymouth	27	Wave Energy Centre	10
GL Garrad Hassan	24	Marine Renewables Canada	3A	West Normandy Marine Energy	1A
GL Renewables Certification	25	MCT - A Siemens Business	12		
GURIT	20	Omey Labs	36		

REGISTRATION DESK

The main registration and information desk will be open in the conference venue as follows:

Tuesday 16th October	17.00 – 19.00	<i>Early Registration for delegates arriving to Dublin on Tuesday</i>
Wednesday 17th October	07.00 – 18.30	
Thursday 18th October	07.30 – 18.00	
Friday 19th October	08.00 – 14.00	

Enquiries for the following should be made at the registration desk:

- Registration queries
- Accommodation queries & bookings
- Gala Dinner bookings
- General information
- Social events
- Technical Tour
- Taxi bookings
- Internet access

NAME BADGES AND GALA DINNER TICKETS

Badges must be worn at all times as this is your ticket to all sessions, including the Welcome Reception. Please note, if you have booked to attend the gala dinner you will find your ticket in your badge pocket. Access to the Convention Centre Dublin will not be given without a badge. Kindly note there is a €10.00 fee to replace a lost name badge.

IDENTIFYING DELEGATES

The following colours will identify the various registration types. This will be seen on the bottom of the badge.

Delegate:	Clear	Sponsor/Exhibitor:	Yellow
Speaker:	Red	Media:	Green
Committee:	Grey		

VOLUNTEERS

Volunteers will be on site for the duration of the ICOE 2012. Volunteers will assist you with directions, event details or information you may require while visiting Dublin. You will easily identify volunteers by their blue t-shirts.

USEFUL ONSITE CONTACTS

For all delegate & accommodation queries please contact:

Lieneke Hodnett, ICOE 2012 Delegate Services Manager - Tel: **+353 863490039**

ACCOMMODATION

Should you require any information regarding your accommodation please proceed to the registration desk located in the foyer area on the ground floor of the Convention Centre Dublin.

SPEAKER PREVIEW ROOM

The speaker preview room is located on the first floor, **Liffey Meeting Room 3**. Speakers should make themselves known at the registration desk where directions to the speaker preview room will be given. If you have already provided your presentation it is advised to preview this in the speaker preview room in advance of your session. Please ensure you provide and preview your presentation no later than **1 hour before** your speaker slot.



PRESS CENTRE

The Media Centre is located on the first floor, **Liffey Meeting Room 1**. Access will only be given to those with media name badges.

For all Media Enquiries please contact the registration desk on the ground floor.

Fiona Smith, Marketing and Communications Manager, SEAI

EXHIBITION

ICOE 2012 is located in the Forum on the Ground Floor of the CCD. Access will only be given to those with name badges. Please see the full list of exhibitors on the inside front cover.

Opening Hours:

Wednesday 17th October	08.00 – 18.00
Thursday 18th October	08.00 – 18.00
Friday 19th October	08.00 – 15.00
Friday 19th October (<i>Public access to the exhibition</i>)	11.30 – 14.00

FIRST AID

If First Aid assistance is required, please notify any volunteer or member of staff. The onsite first aid team will then be notified immediately.

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INTERNET ACCESS

Wireless is available in the Convention Centre Dublin. No password is required for this. Please choose the network named "*CCD Guest*"

ACCESSIBILITY

For those with visual impairments:

- Assistance Dogs are allowed in parts of our venue and water bowls will be provided on request. Please ask a volunteer or member of staff for assistance.
- A describer system for the visually impaired is available in many of the meeting rooms. Please ask a volunteer or member of staff for assistance.
- All rooms, halls, lifts and toilets are signposted in large print and braille.

For those hearing impairments:

- Assisted hearing is available in many of the meeting rooms. Please ask a volunteer or member of staff for assistance.

For those with physical disabilities:

- The CCD main entrance is accessible via a ramp.
- There is lift access to all levels, in addition to escalators and stairwells.
- Eight parking spaces for those with a "disabled persons parking card" are available and the car park lifts gives access to all floors.

Wheelchair Access:

- All meeting spaces are wheelchair accessible.

The CCD



CLOAKROOM

A cloakroom will be open in the foyer for the duration of the conference, free of charge.

CATERING POINTS

Refreshments will be available for purchase in the Forum (Exhibition Hall) on the ground floor.

LOST PROPERTY

Articles lost or found should be reported to the registration desk.

USEFUL INFORMATION - DUBLIN, IRELAND

Telephone Numbers

Directory Inquiries: 11850 or 11890 or 11811

International telephone code: 00

Republic of Ireland telephone code: 00353

Nearby Services

For a list of local services available adjacent to the CCD please see the map on page 32.

This includes ATMs, restaurants, cafés, pubs, shops, hotels, post office, Garda Station and doctors.

Emergency Contact Numbers and Doctors

In an acute emergency dial 999 or 122 (Ambulance, Fire Brigade, Garda Síochána (Police) Lifeboat, Mountain/Coastal rescue)

Local Garda Síochána Station

Store Street Garda Station,

Store Street, Dublin 1.

Tel: +353 1 666 8000

Medical Assistance

Medical centres in close proximity to the CCD:

Custom House Square Medical Centre

2 Gandon House, Mayor Street Lower, IFSC, Dublin 1.

Telephone: 00-353-1-8290902 *Appointments*

www.custommedical.ie

Opening Hours: Monday to Friday: 7.00am - 7.00pm,

Saturday: 10.00am - 2.00pm.

The practice remains closed on Bank Holiday Saturday and Monday.

Hanover Medical

1 Forbes Street, Sir John Rogerson's Quay, Dublin 2.

T: 00-353-1-678 6086

www.hanovermedical.ie

Opening Hours: Monday to Thursday: 8am - 7pm,

Friday: 8am - 3pm.

To see a doctor in case of emergency outside our working hours please contact D-DOC clinic on 1850-224477.

PUBLIC TRANSPORT

Bikes

Dublin Bikes are a perfect way to get around the city, while minimising your effect on the local environment. There are 40 Dublin Bikes stations distributed throughout the city centre to enable easy access and optimal use. Located in close proximity to each other, every station has a minimum of 15 stands in place. There are two stations located in the Docklands area beside the CCD:

- Custom House Quay - Northside beside the Sean O'Casey Bridge
- Pearse Street - Southside near Pearse Street Train Station

DART

The DART (Dublin Area Rapid Transit) is the rail line running along the coast of Dublin, from Malahide and Howth southwards as far as Greystones, Co Wicklow. You can connect to the regular train service for communities north of Dublin, right up to Belfast. Pearse Street and Tara Street DART stations are both located about ten minutes' walk from the CCD.

LUAS

The Luas Red Line runs directly behind the CCD, conveniently linking to downtown Dublin and to Connolly and Heuston rail stations. Stops are provided at George's Dock, Mayor Square and Spencer Dock.

Taxis

Increased availability of taxis in Dublin means that it's easy to travel to and from Dublin city, day or night. There are now nearly 12,000 taxis available in Dublin city. Fares are regulated and tips are at your own discretion.

Taxis can be arranged at the registration desk.

Dublin Bus

Dublin Bus offers a high frequency, accessible and easy to use service from all over Dublin City Centre and the surrounding area. These services include city bus services, Railink, School link, Airlink, Nitelink and DART feeder buses. Dublin Bus also operates day tours and is obliged to provide services to people with disabilities. There is no bus service serving the CCD.

Shopping

Dublin has a busy city centre shopping area around Grafton Street and Henry Street. There is a huge range of products to bring home – from traditional Irish hand-made crafts to international designer labels. Things to buy: woolen knits, tweeds, crystal, claddagh rings, pottery, silver and music. Shopping hours are from 9.00am to 6.00pm Monday to Saturday, with shops open until 8.00pm on Thursdays, and many shops open from 12.00pm – 6.00pm on Sunday.

Eating Out

Ireland is known throughout the world for its high quality food. There is a varied broad selections of restaurants in Dublin. Please also see a list of restaurants adjacent to the CCD listed on the Local Services Map on page 32. A further list is also available at the registration desk.

Tipping

Tipping is at your discretion. In some hotels and restaurants a service charge of 10 – 15% is added to your bill. A small tip is appreciated for good service.

Smoking Policy

Under Irish law smoking is not permitted in pubs, restaurants, hotel lobbies and all enclosed public buildings.

Insurance

The Conference Organising Committee or its agents will not be responsible for any medical expenses, loss or accidents incurred during the congress. Delegates are strongly advised to arrange their own personal insurance to cover medical and other expenses including accident or loss. Where a delegate has to cancel for medical reasons, the normal cancellation policy will apply. It is recommended that citizens from EU countries bring with them a current EHIC card.



Scotland.
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of whisky and
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energy.

We've
a very
productive
obsession
with water.

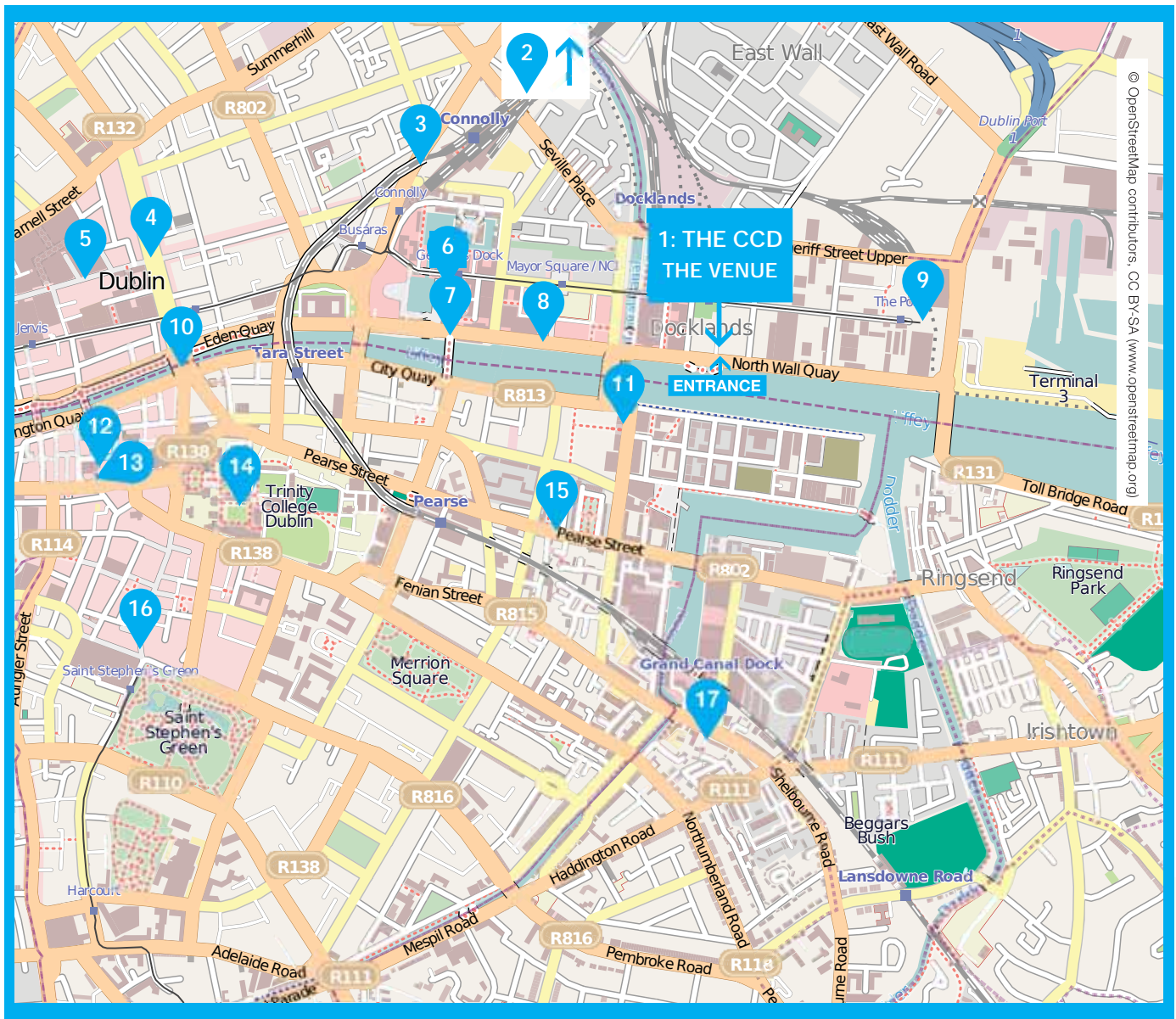
We've got quite a reputation for invention, innovation and enjoying the good life. MRI scanning. Keyhole surgery. The beta-blocker. Whisky. It's a long list. And it's still growing. In every sector from renewable energy and finance, to electronics and our pioneering work in life

sciences, we strive to set standards. We have world-class academic institutions, outstanding research and superb facilities. And passionate people with a hunger to win. We can develop your products and expand your business. And that's precisely why companies invest in Scotland.

To find out more visit us on stand 4A at ICOE 2012 or visit www.sdi.co.uk/energy

SCOTLAND. SUCCESS LIKES IT HERE.





- | | |
|---|--|
| 1. ICOE 2012 Venue: Convention Centre Dublin | 10. O'Connell Bridge: 15 min. walk |
| 2. The Regency Hotel: 10 min. by shuttle bus | 11. Maldron Hotel Cardiff Lane: 3 min. walk |
| 3. North Star Hotel: 15 min. walk / 3 min. walk from Luas | 12. Fleet Street Hotel: 15 min. walk |
| 4. O'Connell Street: 15 min. walk | 13. Temple Bar Hotel: 15 min. walk |
| 5. Henry Street: 15 min. walk | 14. Trinity College Dublin (Gala Dinner): 12 min. walk |
| 6. Ely bar and brasserie, IFSC : 10 min. walk | 15. Pearse Hotel: 8 min. walk |
| 7. Jurys Inn Custom House: 10 min. walk | 16. Grafton Street: 15 min. walk |
| 8. Clarion Hotel IFSC: 3 min. walk | 17. Grand Canal Hotel: 17 min. walk |
| 9. The Gibson Hotel: 5 min. walk | |

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ON OCEAN ENERGY

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2014 tradeshow to overlap with The Maritimes Energy Association's annual CORE conference – an event having roots in the offshore oil and gas industry since it began in Atlantic Canada.

Congratulations and thank you to Sustainable Energy Authority of Ireland and its partners for another successful ICOE!

www.icoe2014canada.org

Ocean Energy Development Unit

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