CONFERENCE PROGRAM DRAFT 7.1

The Pan American Marine Energy Conference, PAMEC 2020, will provide a forum where those at the forefront of technology development in the sector meet, interact, share their latest knowledge and debate new ideas and issues pertinent to wave, offshore wind, ocean thermal energy conversion, salinity gradient and tidal energy conversion with a focus on building and strengthening research and development ties in the Americas, and globally.

CONFERENCE WORKSHOPS, TRAINING COURSE AND EVENTS

We are holding a training course on the use of WEC-Sim (Wave Energy Converter SIMulator) - an open-source code for simulating wave energy converters on Friday January 24, 2020.

We are also holding workshops on best practices and experience from marine renewable energy research and test centers, the state of knowledge on environmental impacts and planning tools at University of Costa Rica from Friday January 24, 2020 to Saturday January 26, 2019.

On Sunday January 26, there will be Canada sponsored lunch and learn in San Jose, and after the Conference on the afternoon of January 28th there will be a site tour at the University of Costa Rica, and several technical workshops. To keep up to date, join the PAMEC.Energy Association Newsletter.

The Pan American Marine Energy Conference has been declared an activity of corporate interest and priority by Costa Rica’s energy utility, the Costa Rican Institute for Electricity (ICE) and an event of national interest by the President of the Republic of Costa Rica, Mr. Carlos Alvarado Quesada and his Minister of Environment and Energy, Mr. Carlos Manuel Rodríguez. PAMEC 2020 also has been recognized as part of our country brand essential Costa Rica. That’s how our small economy presents itself to the world, holistically promoting tourism, investment, research, innovation, culture and uniqueness.


NOTE: This Program is in Draft form – it has been updated on January 6, 2020
Pre-Conference Workshops & Training Sessions

**Friday, January 24, 2020**

**Technical Training Course:**
WEC-Sim (Wave Energy Converter SIMulator) developed and sponsored by National Renewable Energy Labs and Sandia National Laboratories with support from the U.S. Department of Energy’s Water Power Technologies Office (WEC-Sim). WEC-Sim is an open-source code for simulating wave energy converters. The code is developed in MATLAB/SIMULINK using the multi-body dynamics solver Simscape Multibody. WEC-Sim has the ability to model devices that are comprised of rigid bodies, joints, power take-off systems, and mooring systems.


**Agenda**

11:00  Theory of WEC-SIM with a break for lunch  
13:30  WEC-SIM Code Structure  
15:30  Applications  
17:00  Training Course Ends: Uber/Taxi transport to Restaurant in area of Avenida 7, San Jose Costa Rica at participant own cost  
19:30  Return to Hotel at participant own cost

**Friday, January 24, 2020**

**Workshop I:**
Marine Renewables Research and Test Centres – Sharing Experience and Best Practices. This is an opportunity for those who are operating research and test centres to share their experiences as well as those who are planning such ventures to learn best practices. Sponsored by the Fundy Ocean Research Centre for Energy (FORCE)


**Key Supporters and Participants:**
- Tony Wright and Dr. Dan Hassleman, Fundy Resource Centre for Energy (Canada)
- Rob Flynn and Caitlin Long, European Marine Energy Centre (UK)
- Valeria Chávez Cerón, Universidad Nacional Autónoma de México (Mexico)
- Dr. Andrea Copping, Pacific Northwest National Labs (USA)
- Dernis Mediavilla, MERIC (Chile)
- Professor Andres Fernando Osorio Arias, Universidad Nacional de Colombia
- Dr. Georges Govaere, University of Costa Rica (Costa Rica)
- Julio Rojas, Technological Institute of Costa Rica (Costa Rica)
- Peter Scheijgrond, Dutch Marine Energy Center

**Agenda**

13:00  Transport to leave from Crown Plaza Hotel for campus of University of Costa Rica Engineering Campus (San Pedro, San José, Costa Rica)  
13:30  Workshop begins  
15:30  Coffee break provided by UCR  
16:00  Workshop continues  
17:00  Workshop ends: Uber/Taxi transport to Restaurant in area of Avenida 7, San Jose Costa Rica at participant own cost  
19:30  Return to Hotel at participant own cost
Saturday, January 25, 2020

Workshop II:
Environmental Effects and Mitigation for Marine Renewables – Sponsored by OES with Dr. Andrea Copping. Also Planning for Marine Renewables – Experiences with Mapping with experts. Supported by Acadia University and MERIC.

Key Participants:
- Dr. Andrea Copping, Pacific Northwest National Labs (USA)
- Steve Sandford, Nova Scotia Department of Energy and Mines (Canada)
- Dernis Mediavilla, MERIC (Chile)
- Dr. Dan Hasselmann, FORCE (Canada)
- Natalie Rojas and Isa Walker, AQUATERA (UK)
- Jorge Jiménez, MARVIVA Foundation (Costa Rica)

8:00  Transport to leave from Crown Plaza Hotel for campus of University of Costa Rica Engineering Campus (San Pedro, San José, Costa Rica)
8:30  Workshop begins
10:00 Coffee break provided by UCR
10:30 Workshop continues
12:00 Workshop ends and lunch provided by UCR
13:00 Group transport into San Jose at participant own cost – suggest visit to museums in San Jose
Main Conference PAMEC 2020

DAY 1 - SUNDAY JANUARY 26, 2020

Canada Luncheon
12:00 – 14:30
Luncheon Sponsored by Canada, featuring Canadian experience with Marine Renewable Energy at Crown Plaza Hotel, hosted by Canada’s Ambassador to Costa Rica.

Conference Opening
15:00 – 16:30
SESSION I ROUNDTABLE
• Opening Plenary and Welcome (Ms. Eng. Irene Cañas D., Executive President, Costarricano Institute for Electricity, Mr. Carlos Manuel Rodríguez the Minister of Environment and Energy)
  ► Marine Energy and the Blue Economy – a Regional Perspective of Developments and Opportunities
    ▪ Costa Rica Ms. Haydée Rodríguez and Vice-Minister of Water and Seas, Ministry of Environment and Energy, Costa Rica
    ▪ Canada, Elisa Obermann, Executive Director Marine Renewables Canada
    ▪ CARICOM, Devon Gardner, Guyana
    ▪ Chile – Dernis Mediavilla, MERIC
    ▪ Colombia – Professor Andres Fernando Osorio Arias, Universidad Nacional de Colombia.
    ▪ Mexico – Dr. Rodolfo Silva Casarín, CEMEI-Océano
    ▪ USA – Carrie Schmaus, ORISE Science, Technology and Policy Fellow, US Department of Energy

16:30 – 18:00
COFFEE BREAK FOR GENERAL PARTICIPANTS
CLOSED LEADERSHIP ROUNDTABLE EVENT FOR OFFICIALS
• Political and Policy Leadership Roundtable
  ► Participants invited by Government of Costa Rica: Americas Industry and policy leaders

18:00 – 18:30
• Roundtable Leadership Announcement and Media Availability

18:30 – 20:30
• Evening Reception and Meet-&-Greet
DAY 2 – MONDAY JANUARY 27, 2020

8:30– 9:00
SESSION IA – GLOBAL PERSPECTIVES
► Plenary Session (1:30)
► Conference Welcome Speech - Mr. Rolando Castro, Vice-Minister of Energy, MINAE, Costa Rica
► KEYNOTE PRESENTATIONS: The Global Perspective
  o The Future for Renewables - Alessandra Salgado, International Renewable Energy Agency
  o The Future for Marine Energy – Professor Abu Bakr S Bahaj, Executive Board EWTEC

9:00 – 10:15
SESSION II – SETTING THE REGIONAL RESEARCH SCENE
► Plenary Session (1:15)
► Overview on State of Knowledge and Experience
► KEYNOTE PRESENTATIONS:
  o Dr. Richard Karsten (Canada) on Resources
  o Dr. Andrea Copping (USA) on Environment
  o Prof. Cameron Johnstone (UK) Conventional Technologies Tidal
  o Dr. Jochem Webber (USA) Conventional Technologies Waves
  o Diego Acevedo (Aruba) OTEC
  o Sue Barr, Director Marine Power Systems (UK) on Floating Offshore Wind
► Questions

10:15 – 10:45
COFFEE BREAK
10:45 – 12:15
SESSION II.a 1st of 2 Concurrent Sessions

▶ Papers Session (1:30)
▶ Resource Assessment
▶ Session Chair Rodney Mora, University of Costa Rica

Georges Govaere  
Costa Rica  
Wave characteristics on the Pacific coast of Costa Rica for energy production

Henry Alfaro Chavarria  
Costa Rica  
Approaching the wave energy potential in a coastline section of the Nicoya peninsula

Francisco J Ocampo-Torres  
Mexico  
Wave power resource assessment in Northeast México

Emiliano Gorr  
Mexico  
Evaluation of Wave Energy Extraction in a Sheltered Bay

Héctor García Nava  
Mexico  
Wave power availability in the Pacific of Mexico and Central America

Dr. Gabriel García Medina  
USA  
High-resolution Wave Hindcasts for Resource Characterization in the U.S. Pacific Regions

10:45 – 12:15
SESSION II.b 2nd of 2 Concurrent Sessions

▶ Papers Session (1:30)
▶ Environmental Impacts
▶ Session Chair: Ingo Werhtmann, University of Costa Rica, Marine Research

Craig Chandler  
Canada  
Environmental Monitoring of a Floating Tidal Energy Converter in the Bay of Fundy

Richard Karsten  
Canada  
Assessment of Environmental Impacts from In-stream Tidal Devices

Maria Figueroa  
Mexico  
Environmental impacts of energy ocean devices: Life Cycle Analysis

M. Luisa Martinez  
Mexico  
What do we know about the potential impact of ocean energy in the environment?

12:15 -13:15
LUNCH – Guest Speaker Dr. Jorge Jiménez, CEO of Marviva Foundations, Marine Planning

13:15 – 15:15
SESSION II.c.1 1st of 2 Concurrent Sessions

▶ Papers Session (2:00)
▶ Technology - Waves
▶ Session Chair: Henry Alfaro, Engineering Department, University of Costa Rica

Dana Morin  
Canada  
Vancouver Wave Energy Testing Station: Continuous electricity output verification from waves

MoinMojabi  
Canada  
Assessment of the INWAVE WEC-Hybrid PTO Technology in the Canadian Pacific Coast

Adrián Hernández  
Costa Rica  
e.Wave: Maximization of wave energy using an adaptative mechanical system

Melissa Jaramillo  
Mexico  
Numerical study of the effect of a flap-type Wave Energy Converter

Eduardo Santiago Ojeda  
Mexico  
Electrohydrodynamics for a point absorber WEC: theoretical foundation

Galavan-Pozos  
Mexico  
Dynamic analysis of a novel six degrees of freedom device for wave energy extraction

Yi-Hsiang Yu  
USA  
Review of WEC-Sim Development and Applications
13:15 – 15:15  
SESSION II.c.1 2nd of 2 Concurrent Sessions

- Papers Session (1:00)  
- Technology - Tidal  
- Session Chair: Julio Rojas, Technologic Institute of Costa Rica

Dominic Groulx  Canada  Understanding Transient Load on Turbine Blades to Reduce Risks and Assist Design
Craig Chandler  Canada/Germany  Development and Testing of a Tidal Turbine Blade
Penny Jeffcoate  Canada/UK  Floating Tidal Energy Platform PLAT-I
Marlène Moutel  France  From demonstration to commerciality: three stages
Craig Love  UK  ANDRITZ Mk1 Tidal Turbine Operating Experience

13:15 – 15:15  
- Papers Session (1:00)  
- Technology - Tools  
- Session Chair: Isaac Rojas, ICE

Peter Scheijgrond  EU  How International Standardization and Certification can Accelerate Commercial Uptake
Frederick Driscoll  USA  Marine HydroKinetic Tools – MHKiT
Robert Raye  USA  Modular Ocean Data Acquisition System - MODAQ

15:15 – 15:45  
COFFEE BREAK

15:45 – 17:30  
SESSION II.c.2 – 1st of 3 Concurrent Sessions

- Papers Session (1:45)  
- Technology - OTEC  
- Session Chair: Dr. Rodolfo Silva Casarín, CEMEI-Océano, México

Diego Acevedo  Aruba  Case Study of OTEC developments in the Caribbean: Economics, plant sizing and challenges
Sergio Pérez Otamendi  Mexico  Analysis of the performance and efficiency of an OTEC turbine through a simulation program.
Paola Garduno  Mexico  Criteria for the selection of optimal sites for OTEC plants in the Mexican Pacific
Alexander García Huante  Mexico  Possible oceanographic and biological effects due to the operation of an OTEC plant
David Soriano  Mexico  Design of a prototype of a 1kWe open-cycle mareothermic (OTEC) plant
Guillermo Lopez  Panama  Evaluation of the Oceanic Thermal Potential on the Coasts of Panama
15:45 – 17:30
SESSION II.c.2 – 2 of 3 Concurrent Sessions
► Papers Session (1:45)
► Technology - Technology and Resources – Floating Offshore Wind
► Session Chair – Kenneth Lobo, Costarican Electricity Institute

Marianella Bolivara, Colombia: Wind potential and methodological guide for installation of floating offshore wind farm
Mariana Montenegro, Costa Rica: Considerations for Offshore Wind Turbine Design in the North Pacific of Costa Rica
Gallardo Brigido J.C., Mexico: Bathymetry and capacity factor study in areas of the Gulf of Baja California Mexico
Wilfredo Segura, Costa Rica: Multicriteria analysis base on SIG for offshore wind power potentials sites in North Pacific
Kenneth Lobo, Costa Rica: Determination of offshore wind power potential in Costa Rica

SESSION II.c.2 – 3 of 3 Concurrent Sessions
Papers Session (1:45)
► Technology – Salinity Gradient
► Session Chair: Andrés Osorio, Columbia

Mateo Roldan Carvajal, Colombia: Pressure drop in Reverse Electrodialysis: Analysis using CFD
Oscar Alvarez-Silva, Colombia: Salinity gradient energy potential in Latin America with emphasis in Colombia and Mexico
Karen Vázquez Morales, Mexico: Determination of the saline gradient in the coastal zone of the Mexican Caribbean
Alexandro Martinez Flores, Mexico: Hydrodynamic analysis of a reverse electrodialysis device
Alexandro Martinez Flores, Mexico: Optimization and construction of a reverse electrodialysis device
Mateo Roldan Carvajal, Colombia: Pressure drop in Reverse Electrodialysis: Analysis using CFD

18:30 – 22:30
Dinner – at the Hotel and included in registration
DAY 3 - TUESDAY JANUARY 28, 2020
8:30-10:00
SESSION III – RENEWABLES, GRIDS, AND INTEGRATION
► Plenary Session (:30)
► Integrating Marine and Other Renewables Solutions into an Electricity Grid
► KEYNOTE PRESENTATIONS:
  o Mr. Eng. Marco Acuña, Corporate Director of Energy, Costarrican Institute for Electricity
  o Eng. Javier Orozco, Director of Planning and Energy Development, ICE
  o Dr. Gustavo Gómez, Costarrican Technological Institute
  o Dr. Sue Molloy, President Glas Ocean

SESSION III.a – Stand Alone Session
► Papers Session (1:00)
► Micro-Grid Technologies and Solutions
► Session Chair: Dr. Rolando Madriz, UNA-Renovables, National University of Costa Rica

10:00 – 10:30
COFFEE BREAK
10:30 – 11:15
SESSION VI – SOCIAL, ENVIRONMENTAL AND ECONOMIC ISSUES
► Plenary Session (:45)
► Overview on State of Knowledge and Experience
► Moderator: MSc Fernando Mora, former Minister of Sinister of Waters and Sea, Cost Rica
► KEYNOTE PRESENTATIONS
  o Financing Renewable Energy
    ▪ Julio Montes de Oca, UICN
    ▪ CABEI (Central American Bank)
    ▪ Banco Mundial
    ▪ Honduras, Sr. Fernando Fanconi, Banco Centroamericano de Integración Económica
  o Building Social Support - Ms. Zdenka Piskulich, CEO of Costa Rica X Siempre Foundation (confirmation has been requested)
11:15 – 12:45
SESSION VI.a – 1 of 2 Concurrent Sessions
▶ Papers Session (1:30)
▶ Building the Social and Policy Support for Marine Renewables
▶ Session Chair: Sandra Farwell, Nova Scotia Department of Energy and Mines

Steve Sanford  Canada  Governance of Marine Renewable Energy Development In Nova Scotia, Canada
Demis Mediavilla  Chile  MERIC: supporting the development of MRE in Chile
Isa Walker  UK  Lessons learned for Marine renewable energy development in Chile, Peru and Colombia
Andrea Copping  USA  Powering the Blue Economy: Marine Energy for Enabling Applications including Ocean Observations
Caitlin Long  UK  SEA Wave: Addressing the long-term environmental concerns associated with wave energy
Andrea Copping  USA  The Road to Risk Retirement: Evaluating and Communicating Environmental Risks
Norval Collins  Canada  Coastal Energy Development - Recent Canadian Experiences

SPECIAL SESSION 2nd of 2 Concurrent Sessions
▶ UK-Mexico Research Project Dissemination Seminar (1:30)
▶ Tidal Opportunities in Mexico
▶ Session Chair: Prof. Cameron Johnstone, Strathclyde University
  ◀ Tidal energy resource in Mexico, with overview of technology to extract the energy, including lessons learned and funding opportunities to work with Latin-American countries.

12:45-13:00
LUNCH KEYNOTE - TBD
13:00 -13:45
LUNCH

13:45-14:30
SESSION VII –ROUNDTABLE: DO WE HAVE MOMENTUM?
▶ Building Student Connections
  ◀ COMITÉ ESTUDIANTIL DEL CEMIE-OCEANO
▶ Closing Panel Dialog on Value of PAMEC
  ◀ Chair Tattiana Hernández-Madrigal, VP PAMEC.Energy Association
  ◀ Panelists
    ▪ Bruce Cameron, President PAMEC.Energy Association
    ▪ Dr. Rodolfo Silva Casarín, CEMIE-Oceano
    ▪ Dr. José Rodrigo Rojas Morales, ICE
    ▪ Professor Andres Fernando Osorio Arias, Universidad Nacional de Colombia
14:30
SITE VISIT AND TECHNICAL WORKSHOPS
- Bus leaves for UCR
- Bus leaves UCR for hotel at 18:00

15:00
- Visit to New Marine Lab in the Recently Inaugurated Engineering Facilities at the University of Costa Rica
- Technical Workshops at the University of Costa Rica

Workshop III [in parallel with Workshop IV and V]
Boosting Innovation through Standards and Certification (3 hours) sponsored by MET-Certified project. This workshop explores the IEC technical specification and certification schemes for marine energy convertors, covering tidal and river stream, wave energy and OTEC.
Free Registration at: [https://www.iec.ch/meetings/events/workshop_registration.htm](https://www.iec.ch/meetings/events/workshop_registration.htm)

Workshop IV [in parallel with Workshop III]
This workshop features a demonstration of Open Source Software (1 hour) Sponsored by Sandia, NREL and US Department of Energy. This development enables standardized, open-source, turnkey extensible data processing and QC software solutions that are discoverable and accessible, and that have been verified by relevant experts.

Workshop V [Follows Workshop IV]
Integrating Data- PRIMRE (2 hours) Sponsored by US DOE Water Power Technologies Office. Lead by PNNL and NREL. This workshop demonstrates PRIMRE as an integrated approach to all the various databases and portals that the US DOE has created to house MRE data – includes Tethys, MHK data repository.

17:00
- First Buses leave University of Costa Rica for Hotel

18:00
- Second Buses leave University of Costa Rica for Hotel
  - Scheduled to accommodate workshop participants

18:30
PAMEC.Energy Association Members Meeting
- Crown Plaza Hotel – Room Carara