marine renewables canada

2019 ANNUAL REPORT

marinerenewables.ca

Photo credit: SOAR

WHO WE ARE

Marine Renewable Canada is the national association for wave, tidal, offshore wind and river current energy, representing technology and project developers, utilities, researchers, and the energy and marine supply chain. Since 2004, the association has worked to identify and foster collaborative opportunities, provide information and education, and represent the best interests of the sector to advance the development of a marine renewable energy industry in Canada that can be globally competitive.

2019 Board of Directors

Tim Brownlow Atlantic Towing Ltd. – *Chair*
Eric Bibeau Canadian Hydrokinetic Turbine Test Centre
Brad Buckham University of Victoria
Carys Burgess Emera
Michelle Chislett Northland Power Inc.
Dana Morin Independent – *Past Chair*
Sheila Paterson Centre for Ocean Venture Entrepreneurship (COVE) – *Treasurer*
Simon De Pietro DP Energy
Jeremy Poste Independent
Michel Samson Cox & Palmer

The Team

Elisa Obermann *Executive Director*
Amanda White *Operations Director*

LEADERSHIP MESSAGE

This year was significant for the marine renewable energy sector in Canada – a comeback year in many ways with industry perseverance paying off. In Nova Scotia, we are seeing the most activity to date with new entrants and projects. Across the country there has been continued interest in marine renewable energy solutions for remote and coastal communities, which is well aligned with the motivation to displace the use of diesel. Along with domestic opportunity, Marine Renewables Canada's members have also been actively pursuing and engaging in the international market – establishing partnerships and collaborations that will also benefit the growth of Canada's sector.

Tim Brownlow
Chair

Over the course of 2019, Marine Renewables Canada led a number of advocacy, engagement, and trade activities to support its membership and advance the sector. As a more recent part of the mandate, offshore wind energy studies, trade missions, and workshops were carried out in an effort to progress our strategy and ensure that Canada has a place in the growing global offshore wind energy sector.

Elisa Obermann
Executive Director

As Canada and the world increases the focus on climate action and movement towards a low-carbon economy, we know marine renewable energy has a role to play – and we need to work together, with other industries, government, communities, Indigenous groups, the research community, and other stakeholders to help solidify that role. The opportunity for marine renewable energy is immense and largely untapped – and with the foundation in place, Canada is still poised to claim a leadership position in the emerging industry.

SECTOR HIGHLIGHTS

PROJECT AND TECHNOLOGY DEVELOPMENT

Tidal Energy

2019 has been a year of momentum building for the sector in Canada, particularly for tidal energy. With the entry of new players, progress with existing projects, and continued support through enabling initiatives.

Big Moon Power (Nova Scotia)

Big Moon Power completed another successful summer of prototype testing in Nova Scotia and will soon commence prototype testing in New Brunswick in 2020. Big Moon was pleased with the results of the prototype testing in Nova Scotia and the power production that resulted. It marks the final prototype testing done by the developer in Nova Scotia. Data collected through these tests will now be used to work with local engineering firms to finalize the final design drawings for commercial units. These units will be installed in Nova Scotia and grid connected in 2020.

Big Moon will also commence a prototype-testing program in the Province of New Brunswick, allowing the technology to demonstrate it's versatility by producing electricity in the world's strongest water resource in the Minas Passage of Nova Scotia and then producing electricity in the much reduced tidal resource in New Brunswick. Producing commercial scale electricity from slower moving water will drastically expand the number of potential markets available for BigMoon's technology.

Sustainable Marine Energy (SME) (Nova Scotia)

Sustainable Marine Energy (SME) has continued to ramp up its operations in Nova Scotia following the successful installation of their 280kW PLAT-I 4.63 demonstrator in Grand Passage in September 2018.The deployment in Grand Passage demonstrated the benefits of floating tidal energy systems; primarily the ease of installation and maintenance access. It has also provided an excellent platform for scientific and research activities which have largely been focussed on performance validation and developing a greater understanding of potential environmental impacts. SME has been working collaboratively with a number of research and academic organisations including Swansea University, Acadia University, Dalhousie University, Nova Scotia Community College (NSCC), Sustainable Oceans Applied Research (SOAR), FORCE, and Offshore Energy Research Association (OERA), and will be building on the work performed over the next year to develop an environmental monitoring system suitable for deployment on its systems at FORCE.

Sustainable Marine Energy's PLAT-I in Grand Passage, Nova Scotia

SME will continue to utilise the testing and demonstration site at Grand Passage as they continue to prove and improve upon their technology, and have released details of their planned project at FORCE. The 9MW Pempa'q project will be delivered and operated by Spicer Marine Energy, a joint venture between SME and Minas Tidal Ltd, and will utilise SME's next-generation 420kW platform, the PLAT-I 6.40. The detailed design of the platform has been supported by Dartmouth-based Lengkeek Vessel Engineering, and construction of the first of the series will commence early in 2020. The Pempa'q project at FORCE will be built out in stages that will enable the benefits of incremental technology improvements and operational learning to be captured. While SME is currently focused on the delivery of its projects in Nova Scotia, it is continuing to build a pipeline of opportunities further afield, with a focus on diesel replacement for island and coastal communities which will create future export opportunities for their Canadian supply chain partners.

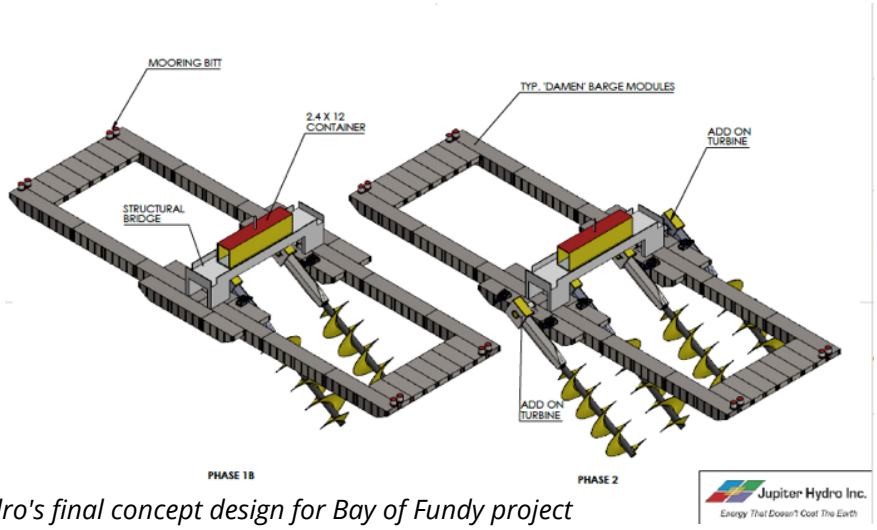
DP Energy (Uisce Tapa Project) (Nova Scotia)

DP Energy was granted $29.75 million under the Government of Canada's Emerging Renewable Power Program (ERPP) in 2018 and a 15 year, $530/MWh FIT by Nova Scotia Power for its Uisce Tapa project at the Fundy Ocean Research Center for Energy (FORCE). The project is a 6 turbine, 9 MW array over two berths at FORCE. The Andrtiz Hammerfest Hydro (AHH) Mk1 turbine planned for Uisce Tapa is principally the same as the Mk1 turbine operating for more than 2 years at the MeyGen facility in Scotland. DP Energy has continued to progress the Uisce Tapa project through 2019, completing site specific turbine engineering, undertaken further site characterisation assessments, finalized turbine placement and cable routing as well as developed a high-level Marine Operations plan. It is on track to begin developing onshore works in the second half of 2020, install subsea cable works in the second half of 2021 and lastly install the subsea structures and turbines in the second half of 2022.

Jupiter Hydro (Nova Scotia)

In August 2019, Jupiter Hydro was awarded two permits from Nova Scotia Department of Energy and Mines (NSDEM) for an in-stream tidal energy project in the Bay of Fundy: One allowing Jupiter to test a non-grid connected 1 MW prototype and the other for 2MW which included the authorization of a power purchase agreement (PPA).

Jupiter has begun the process of detailed design with Hatch in September. It is Jupiter's intention to put two 150 kW screws on the full size swing arms of its tidal device to test and confirm the functionality and efficiency. Jupiter then plans to install two 500 kW screw turbines on the swing arms and test the full-scale units. Jupiter is targeting to deploy its device by fall 2020.



Juiter Hydro's final concept design for Bay of Fundy project

Nova Innovation (Nova Scotia)

Nova Innovation continues to build its team in Canada with staff in Halifax and Ottawa. Over the course of 2019, Nova carried out multiple activities to support its proposed Petite Passage Tidal Project. These included extensive stakeholder engagement, signing of a Memorandum of Understanding with the Municipality of Digby, applications for various licenses and permits, and mapping of supply chain options. Nova's activities and strategy in Canada are supported by the experience it has gained through international projects. It's Shetland tidal array project has now been successfully operating for over three years and has demonstrated cost reductions for tidal energy including a 15% reduction in LCOE last year.

Yourbrook Tidal Energy (British Columbia)

Yourbrook Energy Systems Ltd has continued testing of its 40 kW prototype in Juskatla Narrows on Haida Gwaii to refine and optimize the pump system and high yield blade performance. There is a spirit of cooperation between all the communities on Haida Gwaii to eliminate the use of fossil fuels for the generation of electricity.Yourbrook is currently doing investigative work in conjunction with Council of the Haida Nation on its site for the Kamdis Tidal Power Demonstration project. This project is a 500 kW demonstration project through BC Hydro's Demonstration Generator Inter Grid Connection program. Yourbrook is currently working with BC Hydro and Prime Engineering to complete the System Impact Study required before entering into a power purchase agreement. Its patented system with a pumped storage component creates firm base load power simplifying the transition between diesel generation and renewable power. The successful implementation of the demonstration project will lead to a scaled up 2-2.5 MW project.

Yourbrook Tidal Energy's 40 kW prototype.

FORCE team deploy passive acoustic C-PODs in the Minas Passage

FORCE (Nova Scotia)

FORCE has witnessed an increase in new technology activity since 2018. Recent activity includes:

- The Province of Nova Scotia licensed SME to bring its technology to FORCE as a 1.26-megawatt tidal array.
- DP Energy announced the successful deployment of tidal current sensors on their site at FORCE, with support from Canadian companies Seaforth Geosurveys and Huntley's Sub Aqua Construction, in preparation for a nine-megawatt tidal system.
- FORCE Science Director Dr. Dan Hasselman was selected to be Canada's lead expert in the "State of the Science Report 2020."

Monitoring activities at FORCE from May 2016 to present have been conducted with academic and research partners including Acadia University, Envirosphere Consultants, GeoSpectrum Technologies Inc., JASCO Applied Science, Luna Ocean Consulting, Nexus Coastal Resource Management, Ocean Sonics, Sea Mammal Research Unit Consulting, and the University of Maine. FORCE's cumulative totals represent more than 2,700 'C-POD' marine mammal monitoring days, more than 400 hours of hydroacoustic fish surveys, bi-weekly shoreline observations, over 50 observational seabird surveys, four drifting marine sound surveys and additional sound monitoring, and 11 days of lobster surveys using 32 traps.

Sustainable Oceans Applied Research (SOAR) (Nova Scotia)

SOAR is a not-for-profit organization working to help establish Digby Neck and Islands as a globally recognized focal point for marine renewable energy and smart-grid innovation – with further application throughout Canadian remote communities, and beyond. As an initial step, SOAR has been working to advance tidal energy projects in Grand Passage and Petit Passage, as a crucial component of sustainable, clean, and secure coastal community power systems. To help enable this, SOAR has been working with local communities, industry, and academics to advance research, and understating of tidal energy, while establishing shared use marine infrastructure. This includes an initiative with the Village of Freeport to rebuild a historic wharf with adjacent marine shop, both located within Northeast Cove – a sheltered waterbody connected to Grand Passage.

The Grand Adventure and initial system texting for the Jetyak, an autonomous jet powered kayak, carrying the Ping DSP sonar. On the boat are Richard Cheel (Dalhousie University), Dr. Alex Hay (Dalhousie University), Dr. Brian Ward (National University of Ireland Galway), and Greg Trowse (SOAR).
Photo credit: Amy Tudor, freelance photographer, Westport, NS.

SOAR's largest active research project is in partnership with the Canadian Hydrokinetic Turbine Test Centre (CHTTC), which has collectively secured $1.4 million through Natural Resources Canada's (NRCan) Clean Growth Program. The project runs through March 2021 and is titled "Addressing technical challenges to enable hydrokinetic clean power generation in river and coastal communities." SOAR is leading 3 work packages, including: 1) Best practices for site assessments at remote locations; 2) Monitoring marine animals at tidal energy sites; 3) Turbulence/wake assessments.

In addition to existing partnerships, SOAR offers cost effective access to two small (yet highly capable) research vessels based in Southwest Nova Scotia for collaborative work that aligns with any of the work packages listed above.

left to right, Dr. Len Zedel (Memorial University), Greg Trowse (SOAR), Mark Downey (Memorial University), Muriel Dunn (Memorial University), and Gavin Feiel (SOAR) on the Kipawo (Huntley's Sub-Aqua Construction) prior to deploying co-located BioSonics DTX split-beam echosounder, RDI Workhorse ADCP, and Sub Aqua Imaging optical camera. Photo credit: Huntley's Sub-Aqua Construction

Offshore Energy Research Association (OERA) (Nova Scotia)

The Offshore Energy Research Association (OERA) has supported a diverse number of research studies and initiatives over its 13-year history facilitating in tidal energy development. Since 2006, the OERA has funded or co-funded close to 100 research projects that combined with partner leverage has reached a total research investment close to ~$20 Million. OERA's marine renewable energy research highlights for 2018-2019 include:

- Advancements in how to optimize tidal, wind and solar electricity generation using energy storage (Dr. Swan, Dalhousie University);
- Development of a new subsea 'dynamic mount' platform structure, that significantly improves the field of view for monitoring marine life near turbines in high flow conditions (Open Seas Inc. and FORCE);
- Quantifying fish-turbine interactions using innovative high residency acoustic electronic fish tagging technology (Dr. Stokesbury, Acadia University and VEMCO);
- Laboratory testing of a wind turbine retrofit –the 'Power Cone' along with new composite blade materials, that together are showing promise for adaptability and use in improving tidal turbine performance (Biome Renewables, Glas Ocean, Dalhousie University, & Alison Mark consulting).
- Development of a wireless communication link for use in monitoring the presence and location of marine mammals in real-time around tidal turbines (Dr. Bousquet, Dalhousie University & Ultra Electronics).

OERA, in partnership with FORCE, also launched the Pathway Program - a multi-year initiative to define, test and validate an environmental monitoring solution for tidal energy development. The program goal is to create an integrated sensor technology system that brings regulatory acceptance and approval, facilitating in the development of marine renewable energy projects in Canada. Funding support for Pathway is provided by the Government of Canada and the Province of Nova Scotia, with program success expected in March 2021.

Wave Energy

Marine Renewables Canada has a number of members that are engaged in the broader clean marine energy space – providing services or technologies that can help to decarbonize marine and offshore industries. This is a space that continues to grow and presents many complementarities with marine renewable energy and their collective contributions and impact to the blue economy.

University of Victoria (IESVic) (British Columbia)

The University of Victoria has been leading work in wave energy and clean energy for remote community development working with local suppliers, industry, researchers, and Indigenous communities. Key project and activities included:

- Research methods for extreme wave assessment in coastal waters
- Wave measurement and instrument development.
- Microgrid assessment for Hot Springs Cove Hesquiaht First Nation and Barkley Project Group).
- Investigation of integration scenarios for two island grids in Haida Gwaii, British Columbia.
- Construction of a cell-scale battery test facility at Pacific Regional Institute for Marine Energy Discovery (PRIMED).
- Collaboration with AOE on the development of air pumping wave energy converter concept.
- Collaboration with Blutility to conduct a simulation-based design study of wave energy converter concept.
- Muchalaht First Nation project including FEED study.
- Examination of new model for predicting hydrodynamic forces on point absorber type wave energy converters.

River Current Energy

ORPC Canada (Quebec)

In partnership with both Inuit and Cree communities, ORPC Canada will complete a feasibility study and community outreach initiative for a site assessment of the Great Whale River in Québec. This project is a first step for the evaluation of marine resources and installation of ORPC RivGen® marine renewable energy power systems in this community and in other remote communities in northern Québec and Canada.

The project, modeled upon a successful project realized in Alaska by the Igiugig community and ORPC, will provide initial planning for the proposed installation of a clean source of renewable energy for northern communities that will create jobs, enable commercial growth of a new industry, co-exist sustainably with marine life, and improve the environment by reducing, if not eliminating risks that currently exist from diesel fuel use.

ORPC RivGen® marine renewable energy power system

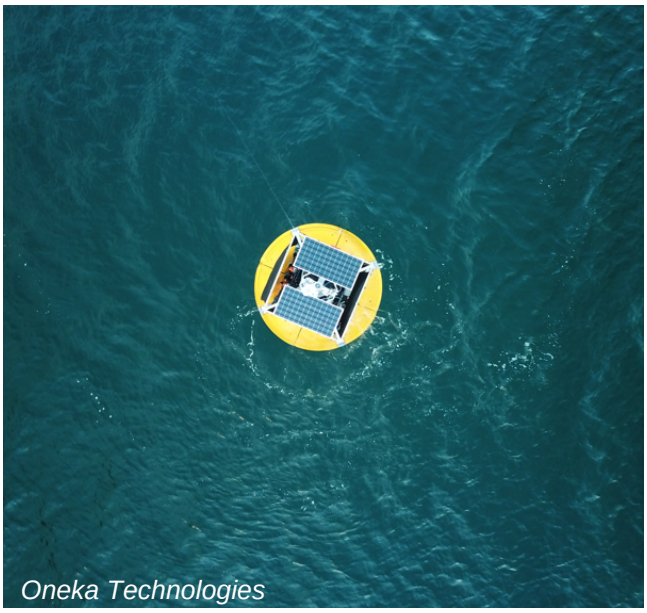
Clean Marine (cleantech in marine & offshore industries)

Marine Renewables Canada has a number of members that are engaged in the broader clean marine energy space – providing services or technologies that can help to decarbonize marine and offshore industries. This is a space that continues to grow and presents many complementarities with marine renewable energy and their collective contributions and impact to the blue economy.

Oneka Technologies (Quebec)

Oneka has been focused on producing and commercializing autonomous desalination units providing drinking water from the ocean using only waves as an energy source. Its last generation unit produced from 5 to 10 m3 of fresh water per day depending on the condition and demonstrated that the technology can perform well.Oneka completed a financing round at the end of 2018 totalling $2M. Since then, Oneka's commercial activities have proven successful, with growing interest from users in Florida, the Caribbean and Chile. Onkea was also a winner of the CONCEPT stage of the US Department of Energy's Wave to Water Prize and will proceed to the next stage of the challenge (DESIGN stage). Oneka has been developing a new generation buoy that has been improved to reduce the OpEx of the technology and will be launched soon.

Oneka Technologies team



Oneka Technologies

Growler Energy (Newfoundland)

Growler Energy has been conducting a study for the Newfoundland Environmental Industry Association (NEIA) that will identify clean technologies applied in the offshore oil and gas supply chain in the most progressive jurisdictions such as Norway and the United Kingdom (UK). The study will result in a repository of clean technologies and companies that can support ongoing globalization efforts to diversify Newfoundland's (NL) oil and gas supply chain – while identifying opportunities to develop NL's resources more sustainably.

POLICY, LEGISLATION AND ENABLING ACTIVITIES

Federal Government

With 2019 being an election year, the Government of Canada was focused on progressing and implementing a number of key priorities – several of which had relevancy to the marine renewable energy sector:

- *New legislation through passing of Bill C-69*: In June 2019, the Senate passed Bill C-69, which included new legislation affecting regulation of the energy sector and marine renewable energy – the *Canadian Energy Regulator Act (CERA*), the *Impact Assessment Act (IAA),* and the *Canadian Navigable Waters Act*. The Fisheries Act was also substantially amended.

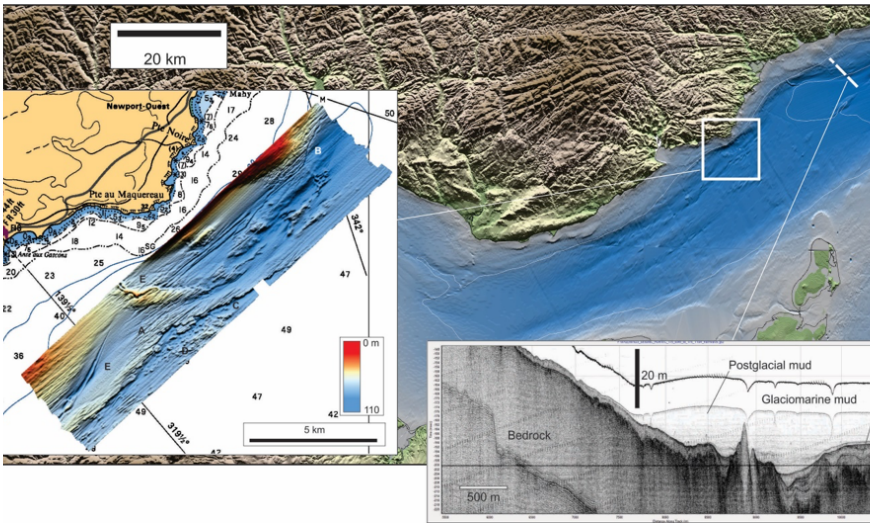
  While the National Energy Board (NEB) did not play a major role in marine renewable energy projects in the past, the new Canada Energy Regulator (CER) under CERA now has a mandate to cover emerging energy developments such as the regulation of offshore renewable energy.

  The *Impact Assessment Act (IAA)* creates the new Impact Assessment Agency of Canada and repeals the Canadian Environmental Assessment Act. The process to establish the IAA also included changes to the Project List Regulations under the IAA which address in-stream tidal energy and offshore wind project thresholds.

- *Treasury Board Secretariat Regulatory Review*: The Treasury Board of Canada Secretariat has been coordinating a three-year targeted Regulatory Review process with federal departments and agencies. Targeted Reviews explore ways to enable regulations to be more agile, transparent and responsive, while continuing to protect the health and safety of Canadians and the environment. The second round of Reviews included clean technology and may have some relevance for marine renewable energy technology. The Review is aimed at addressing regulatory barriers, as well as develop new regulatory approaches to enhance clean innovation and competitiveness.

- *Breakthrough Energy Solutions Canada*: In partnership with Breakthrough Energy, Natural Resources Canada (NRCan) launched a $30 million call for proposals aimed at leverage financing and expertise to support the advancement of Canadian clean energy technologies that can significantly reduce greenhouse gas (GHG) emissions. Breakthrough Energy Solutions Canada also partnered with the Business Development Bank of Canada (BDC), allowing cohort projects to benefit from BDC's experience as well as a further investment of up to $10M for successful cohort companies.

- *Seabed review and assessment:* The Geological Survey of Canada is currently conducting a review and assessment of seabed foundation conditions in the offshore regions of the Maritimes. The resulting report will summarize seabed composition, morphology, stability, and geotechnical properties, based on existing data. The report will be released publicly in 2020 and is expected to be useful for anyone considering future, marine renewable development projects.



The Geological Survey of Canada advises on shallow seabed conditions offshore eastern Canada based on an extensive, but patchy collection of seabed data. In an upcoming report, the GSC divides Maritime coastal regions into 23 zones, each with its own unique set of seabed conditions. The GSC report uses multibeam vignettes, where available, that show true complexity of the sea floor, and legacy seismic data to illustrate subsurface sediment types and thicknesses.

British Columbia

- *CleanBC*: The Government of British Columbia released its CleanBC plan, a pathway to achieve the Province's legislated climate targets of reducing greenhouse gas (GHG) emissions by 40% by the year 2030, based on 2007 levels. The plan describes and quantifies measures that will eliminate 18.9 megatonnes (Mt) of its 2030 target under three categories: Transportation, Buildings, Industry. A key action of the plan is support for communities including helping "remoted communities reduce dependence on diesel."

Nova Scotia

- *Marine renewable energy demonstration permit program*: Launched in January 2018, the Demonstration permit program continues to draw interest. Marine renewable energy permits let project developers test or demonstrate new ways of generating marine renewable energy. Applicants may apply for unconnected permits to test non-grid connected devices or demonstration permits to deploy and connect devices to the electrical grid in the Province. Each demonstration project may be permitted no more than five (5) megawatts of new generating capacity, with a total of no more than ten (10) megawatts available under the program. To date, 7 MW have been allocated (5 MW allocated to Big Moon Power in 2018; 2 MW allocated to Jupiter Hydro in 2019; and one application is presently under review and considers 1.5 MW proposed by Nova Innovation).

- *Amendments to Nova Scotia's Marine Renewable Energy Act:* The Government of Nova Scotia amended its Marine Renewable Energy Act (Bill 175) to allow for extensions of FITs/PPAs for tidal energy developers currently working at the FORCE site. This allows for current investments and activities to be built upon and provides an opportunity for developers to attract future support and investment. The Bill reached Royal Assent on October 30th.

- *Procurement process for vacant berth:* The Government of Nova Scotia hired a team from Power Advisory LLC to serve as procurement administrator for a call for proposals for the vacant berth at FORCE which has been occupied by Cape Sharp Tidal's OpenHydro turbine. The administrator will only consider proposals that include a private sector solution for the Cape Sharp turbine and will have the authority to issue a power purchase agreement and a licence, if there is a successful proposal. The project size will be limited to no more than four megawatts at a maximum rate of 53 cents per kilowatt hour. Companies will be required to have a minimum of $4.5 million in security to cover all costs associated with the Cape Sharp turbine and additional security will be required before any new device is deployed.

- *Sustainable Development Goals Act*: Nova Scotia introduced the *Sustainable Development Goals Act* which included several key actions:
  - reduce Nova Scotia's greenhouse gas emissions by 53 per cent below 2005 levels by 2030
  - move Nova Scotia to a net zero carbon footprint by 2050
  - create a Sustainable Communities Challenge Fund to support community projects that fight climate change and grow the economy
  - ensure a new climate change strategy is in place by the end of 2020 to reduce greenhouse gas emissions, expand Nova Scotia's green economy and create jobs

OUR WORK: ADVANCING THE SECTOR

Marine Renewables Canada supports the advancement of the sector through industry-building activities including international business development, knowledge-building workshops, advocacy, and supporting the needs of our membership as it continues to grow. Over the course of 2019, the association led a number of initiatives aimed at growing the sector.

ENGAGEMENT & ADVOCACY

The association is very focused on advocating for the sector, working to inform policy development and identify issues that affect marine renewable energy development. In 2019, Marine Renewables Canada was involved in a number of federal and provincial government initiatives:

- Submission on Proposed Project List Regulations under Proposed Impact Assessment Act (May 2019)
- Joint submission via Canadian Council on Renewable Electricity (CanCORE) to federal political party leaders re: Role of Renewable Electricity in Canada's Federal Economy & Environmental Policies
- Joint submission via CanCORE to Environment & Climate Change Canada (ECCC) Re: Use of proceeds from the Federal Output-Based Pricing System (OBPS) (August 2019)
- Joint submission via CanCORE to ECCC Re: Clean Fuel Standard (CFS) Proposed Regulatory Approach (August 2019)
- Submission to the Treasury Board Secretariat Regulatory Review for Clean Technology (October 2019)
- Submission on Amendments to Nova Scotia's Marine Renewable Energy Act (October 2019)

Alliances and Strategic Partners

In 2019, Marine Renewables Canada continued to work with like-minded organizations and networks to support the needs of the sector and promote opportunities that marine renewable energy presents.

- *CanCORE:* The association continues to work with its partners – Waterpower Canada, Canadian Wind Energy Association (CanWEA), Canadian Solar Industries Association – through the alliance established in 2015, the Canadian Council on Renewable Electricity (CanCORE). CanCORE continues to provide advice and education on how renewable electricity can play a significant role in meeting GHG reduction targets and overall climate change goals.

- *Canada Cleantech:* The association became a member of Canada Cleantech – a national network of associations and organizations focused on clean technology. Membership in the network provides an opportunity for members to learn about numerous funding and knowledge-building opportunities and share information about marine renewable energy technologies.

Members of CanCORE (MRC, CanWEA, CanSIA, Waterpower Canada) and Energy Storage Canada on a panel at the energy3 Conference.

OFFSHORE WIND ENERGY STRATEGY

Marine Renewables Canada officially added offshore wind to its mandate in January 2018 - this as a natural fit given the membership's area of expertise and the knowledge and experience the association had obtained through supporting other marine renewable energy development. Since that time, the association has successfully led a number of activities to support engagement in offshore wind including:

- Inclusion of offshore wind in Annual Conferences – 2017 & 2018 and energy3 in 2019
- DAI study and workshop - Supply Chain and Market Quantification Framework for the Marine Renewable Energy Industry (offshore wind + tidal) (April 2018)
- Establishment of an Offshore Wind Energy Working Group and draft Offshore Wind Action Plan developed (May 2018)
- Submission to Government of Canada on Bill C-69/legislative framework for offshore wind (June 2018)
- Development of communications materials for offshore wind (infographics, fact sheets) (June 2018)
- Creation of an offshore wind seat on the Board of Directors (2018)
- Offshore Wind Workshop with OTCNS – Halifax, NS (February 2019)
- Ongoing engagement with federal and provincial governments regarding offshore wind opportunities and support mechanisms
- Submission on Proposed Project List Regulations under Proposed Impact Assessment Act (May 2019)
- Trade Mission to US Offshore Wind Conference (June 2019)
- Commissioning of study "Opportunities for Atlantic Canada Industrial Supply Chain in US Northeast Offshore Wind Developments" (June 2019)
- Information Session - Opportunities for Atlantic Canada Supply Chain in Global Offshore Wind Developments – Halifax, NS (October 2019) & St. John's, NL (December 2019)

The association is now developing a more robust strategy with its Offshore Wind Working Group to set goals, objectives, and actions for both long and short-term activity in offshore wind energy. This will include actions to address both the long-term potential of domestic development and near-term actions to support members in international trade opportunities, particularly in the US offshore wind energy industry. It is expected that the strategy will be finalized and establish in the first quarter of 2020.

ENGAGING IN THE GLOBAL MARKET:
INTERNATIONAL BUSINESS DEVELOPMENT

Trade Missions & International Engagement

Canadian Renewables Mission to Chile & Insights into the Argentine Market
Santiago, Chile (March 2019)

Marine Renewables Canada participated in a mission to Chile organized by the Canadian Trade Commissioner Service (TCS) of Global Affairs Canada, with two board members attending on behalf of the association and four member companies participating. The mission objective was to find new trade opportunities in one of the most dynamic renewables markets in Latin America. Mission activities included:

- Briefing on the Chilean and Argentinian energy and renewables markets
- B2B matchmaking sessions with executives of leading Chilean renewable energy, electric power distribution and mining companies
- Roundtable with Argentinian renewables expert and technical site visits
- Networking event to establish and/or strengthen linkages with local contacts

During this mission a Memorandum of Understanding was signed between Marine Renewables Canada and ADEMAR (like-minded marine energy industry association in Chile) to further collaboration between Canada and Chile to advance marine renewable energy in both regions.

Signing of MOU between Marine Renewables Canada and Chile's ADEMAR.

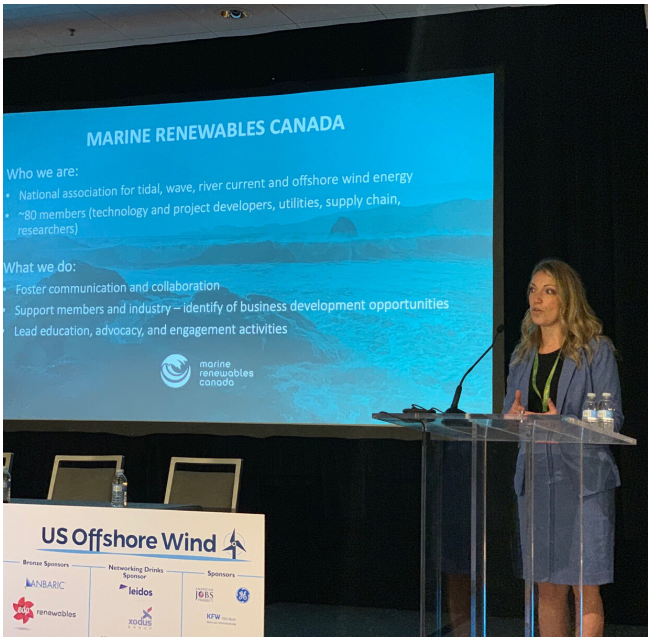
Trade Mission to US Offshore Wind Conference (USOW19)
Boston, Massachusetts (June 2019)

As part of its Offshore Wind Energy Strategy, Marine Renewables Canada is identifying supply chain opportunities in the United States and supporting members entry into this growing market. This year, the association led its first offshore wind mission to the US Offshore Wind Conference (USOW19). Working with the Atlantic Canada Opportunities Agency (ACOA), Global Affairs Canada, and Nova Scotia Department of Energy & Mines, Marine Renewables Canada led a successful delegation of 18 people, representing 15 organizations from across Canada.

Highlights of the USOW19 Mission included:

- A high-traffic exhibit space used for meetings by mission delegates and for providing information to conference attendees.
- A "Canadian Experience & Expertise in Marine Energy" session at the Consulate General office in Boston, with welcoming remarks given by David Alward, Consul General of Canada in Boston.
- Presentation in the main conference, given by Marine Renewables Canada on "Unlocking Canada's potential in offshore wind".

The mission to USOW19 played a significant role in the overall strategic plan and allowed active and leading companies the opportunity to make valuable business contacts and to establish new collaborative linkages and networks that will be important as this industry moves forward in the US.



Trade Mission to the European Wave and Tidal Energy Conference (EWTEC) Naples, Italy (September 2019)

Building on the success of past engagement at EWETEC, Marine Renewables worked with the Atlantic Canada Opportunities Agency (ACOA), Global Affairs Canada and the Nova Scotia Department of Energy, to lead a successful mission to EWTEC 2019. The mission delegation consisted of 9 organizations across Canada.The Mission and associated activities included a pre-mission and onsite briefing (overview of EWTEC, Italian market intelligence), tradeshow pavilion, marketing/promotional materials, matchmaking services including post-mission aftercare, and a Canada hosted networking event – Canada Evening Reception.

Highlights of the Mission included:

- Organization and realization of 75 strategic meetings for 9 Canadian companies/organizations by matchmaking consultants.
- Canadian booth strategically placed and well represented in the EWTEC exhibition.
- Canada Reception attracting over 100 attendees.
- Canadian representatives from FORCE, Dalhousie University and AXYS presented at the conference.

Candian delegation at EWTEC 2019 in Naples, Italy.

Hosting of International Delegation to energy3
Halifax, Nova Scotia (October 2019)

Marine Renewables Canada hosted a delegation of eight international industry experts from key markets, including the UK (Scotland, Wales) Europe, Brazil and the US to energy3 (held as our annual conference for 2019).

The association created a robust International Delegate Program to engage participating international delegates as well as others attending energy3. This program provided additional information on key markets by including international expertise in the conference program, participation in the “International Updates & Collaboration” Luncheon that focused on discussions around how Canadian companies and organizations can successfully partner with international companies and organizations, and an opportunity to network with and meet with the international delegates one-on-one (through B2B and assisted matchmaking).

International panel at energy3 Conference.


Rob Flynn, EMEC and Sheila Paterson, COVE


David Jones, Marine Energy Wales

ASSOCIATION-LED EVENTS & OUTREACH

Offshore Wind Supply Chain Information Session

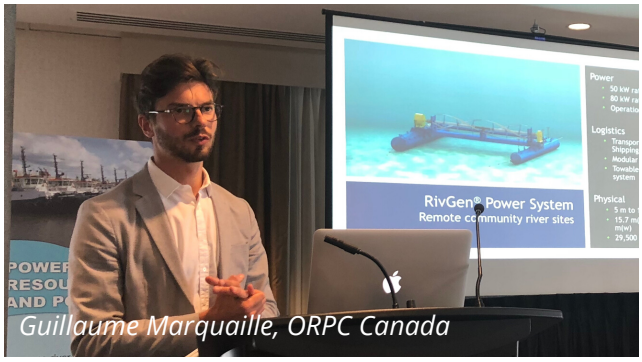
Dartmouth, Nova Scotia (February 2019)

Marine Renewables Canada, in partnership with the Ocean Technology Council of Nova Scotia (OTCNS), hosted an Offshore Wind Supply Chain Information Session that featured presentations from international speakers from Scotland, Germany and the US. Information and insight was provided on projects in their regions, challenges and success, developing a supply chain and opportunities that may exist.

West Coast Summer Event

Victoria, British Columbia (July 2019)

As an effort to continue engagement and increase outreach about the benefits and opportunities that could be realized from marine renewable energy development in British Columbia, Marine Renewables Canada held a west coast workshop in Victoria, BC in July – "Opportunities for BC in Marine Renewable Energy." The workshop included presentations on coastal and remote community opportunities in marine renewable energy, achieving cost competitiveness, technologies for community-scale sites, supply chain experiences, international market opportunities, and an update on the Government BC's strategies and support for clean energy and the low-carbon economy. The event engaged association members, provincial and federal government, local businesses, and other NGOs.



Guillaume Marquaille, ORPC Canada

Brad Buckham, University of Victoria

Panel at INORE Symposium

East Coast Summer Event: Industry Updates Session & Nautical Networking Event

Halifax, Nova Scotia (August 2019)

An enhanced summer event was hosted this year which included the annual Nautical Networking Event, preceded by an Industry Updates Session. This session served to highlight information about local projects and international projects and market opportunities and included presentations from Nova Scotia Department of Energy & Mines, DP Energy, Sustainable Marine Energy, Jupiter Hydro, FORCE, OERA, Natural Resources Canada/Geological Survey of Canada, Marine Energy Council (UK), SABELLA, and Levitan & Associates, Inc.

energy3 Conference

Halifax, Nova Scotia (October 2019)

Marine Renewables Canada partnered with The Maritimes Energy Association (MEA) and OERA to deliver a new all-energy conference – energy3: Canada's Energy Conference. The event was aimed at recognizing the interconnectedness of the energy sector and the value of bringing together diverse perspectives from industry, government, researchers, and stakeholders. As part of the global energy mix, marine renewable energy was a key element of energy3 which was aimed at providing an opportunity for industry and researchers involved in the marine renewable energy sector to be profiled in the larger energy context and make important connections with businesses, organizations, and government working in the broader energy sector.

The conference included three full days of activities including workshops, concurrent speaker sessions, plenaries and keynotes, poster sessions, R&D sessions, exhibition & tradeshow, welcome reception, networking dinner (East Coast Seafood Fest), B2B meetings, Science Slam, poster competition, data visualization room, and test drives of electric vehicles (EV).

energy3 featured multiple sessions dedicated to marine renewable energy and successfully attracted the International Renewable Energy Agency (IRENA) to host an ocean energy focused workshop at energy3. Fellow CanCORE partners (CanWEA, CanSIA, Waterpower Canada) and Energy Storage Canada also participated in a panel on Canada's advantage in renewable energy.

energy3 attracted over 430 delegates, 31 exhibitors, and 120 presenters/speakers. Representatives from over 7 different countries were in attendance. The participant profile was comprised of energy professionals, utilities, government, multinationals with interests in energy/technology development, supply chain businesses, and researchers (academia and students).

Workshop - Retiring Regulatory Risk for Tidal Energy Projects

Halifax, Nova Scotia (October 2019)

The association hosted a workshop in October focused on discussing the current environmental regulatory barriers for tidal energy developers. Attendees included Fisheries and Oceans Canada, Natural Resources Canada, Nova Scotia Department of Energy & Mines, Nova Scotia Department of Environment, FORCE, OERA, and various tidal energy developers. Dr. Andrea Copping from Pacific Northwest Laboratory, an expert in environmental effects of marine renewable energy and risk mitigation, attended as a guest speaker. There were some positive outcomes in identifying potential projects that could address some of the environmental unknowns and perceived risks.

Information Session: Opportunities for Atlantic Canada Supply Chain in Global Offshore Wind Developments

Halifax, Nova Scotia (October 2019)

Marine Renewables Canada and the Newfoundland and Labrador Environmental Industry Association (NEIA) both commissioned studies to assess the supply chain opportunities for Atlantic Canadian companies to get involved in US and European offshore wind energy projects. In partnership, Marine Renewables Canada and NEIA hosted sessions in Halifax and St. John's to present the results of the studies and support member companies and others with interests in getting involved in the sector. The sessions were an opportunity to get an understanding of the business opportunities in offshore wind and develop a strategy to access the market.

Additional tradeshow participation and speaking engagements

Marine Renewables Canada engaged in a number of other conferences either through exhibiting or speaking including:

- Energizing Atlantic First Nations - Clean Energy Conference – Fredericton, NB (February 2019)
- Smart Energy Event – Halifax, NS (April 2019)
- Envision Conference – Victoria, BC (May 2019) \
- NOIA Conference & Atlantic Canada Petroleum Show – St. John's, NL (June 2019)
- H2O Conference & Tradeshow – Halifax, NS (June 2019)
- International Network for Offshore Renewable Energy's (INORE) North American Symposium – Victoria, BC (July 2019)
- Port Days – Port of Halifax – Halifax, NS (September 2019)

OUR MEMBERS

We are proud to have members from across the country and internationally who represent different aspects of the marine renewable energy sector -- suppliers, utilities, project and technology developers, government, communities, and academia.

Marine Renewables Canada is pleased to welcome new members who have joined the association in 2019: Barkley Project Group, DF Barnes, Global Public Affairs, Green Marine (UK) Ltd., Long Range Energy, McDonough Manufacturing Canada, Ocean Sonics, Oneka Technologies, PanGeo Subsea and QPS.

Marine Energy Leader Members

Andritz Hydro Canada Inc
DP Energy
Northland Power
Sustainable Marine Energy

Acadia Tidal Institute
Aecon Atlantic Industrial Inc.
Arthur J. Gallagher Insurance & Risk Management
ASL Environmental
Atlantic Towing
Atlantica Centre for Energy
AXYS Technologies
Barkley Project Group
Beth Dickens (Quoceant Ltd.)
Bigmoon Power
Blumara
Borden Ladner Gervais LLP
Bourque Industrial Ltd.
Canadian Hydrokinetic Turbine Test Centre
Cascadia Coast Research Ltd.
Cherubini
Cox & Palmer
CSR GeoSurveys Ltd.
Cumberland Energy Authority
DF Barnes
Digby Development Agency
DNV GL
Dominion Diving
DSA Ltd.
Emera
Enginuity
Envigour
Fundy Ocean Research Center for Energy (FORCE)
Glas Ocean Electric

Green Marine (UK) Ltd.
Growler Energy
Go With the Flow Technologies Inc.
Horizon Maritime
Hydro Group Plc
Institute for Ocean Research Enterprise (IORE)
Irving Equipment
Jupiter Hydro Inc.
Lengkeek Vessel Engineering Inc.
London Offshore Consultants (Canada) Ltd.
Long Range Energy
Marine Institute of Memorial University
McDonough Manufacturing Canada
McInnes Cooper
McKeil Marine
Mersey Consulting
Minas Tidal
National Research Council
New Energy Corp
Nova Innovation
Nova Scotia Department of Energy & Mines
Ocean Renewable Power Company (ORPC)
Offshore Energy Research Association (OERA)
Oneka Technologies
Operational Excellence Consulting
Orbital Marine
PanGeo Subsea
Port of Halifax
Port Saint John
R.J. MacIsaac Construction Ltd.
RMI Marine Limited
Rockland Scientific International
ROMOR Atlantic Limited
Seaforth Geosurveys
SRM Projects
Stanley Smith
Stantec
Strum Consulting
Tony Tung (T Tung Hydraulic and Renewable Energy Technologies Inc.)
Ulnooweg Development Group
University of Victoria
Yourbrook Energy Systems

Affiliate Members

Atlantica Centre for Energy
Canadian Hydropower Association
Canadian Solar Industries Association
Canadian Wind Energy Association (CanWEA)
Clean Energy BC
Marine Energy Wales
Maritimes Energy Association (MEA)
Ocean Technology Council of Nova Scotia
Pacific Ocean Energy Trust (POET)

marine renewables canada

marinerenewables.ca