Submission to the Department of Fisheries and Oceans Canada's Blue Economy Regulatory Review

By: Marine Renewables Canada

Contact:
Elisa Obermann
Executive Director
Marine Renewables Canada
902-817-4317
elisa@marinerenewables.ca

March 31, 2023

Blue Economy Policy Directorate
Fisheries and Oceans Canada
BlueEconomy-EconomieBleue@dfo-mpo.gc.ca

Re: Written Submission for the Department of Fisheries and Oceans Canada's Blue Economy Regulatory Review

Marine Renewables Canada (MRC) is the national association for tidal, offshore wind, wave and river current energy, representing over 150 technology and project developers, utilities, researchers, and the energy and marine supply chain.

As part of our focus on developing the sector, MRC is active in catalyzing opportunities for how marine renewable energy can contribute to achieving net-zero goals through the production of green fuels such as hydrogen, providing clean energy to the grid, as well as the displacement of diesel in remote communities and marine industries. Marine renewable energy is uniquely positioned to help achieve two of Canada's key priorities: fighting climate change and growing a sustainable and inclusive economy. The Department of Fisheries and Oceans Canada (DFO) has a key role to play in enabling and supporting the development of marine renewables by creating a regulatory climate that provides the certainty and predictability required to accelerate projects.

MRC commends DFO on its commitment to developing a comprehensive Blue Economy Strategy and its implementation of the Blue Economy Regulatory Review (BERR) in collaboration with the Treasury Board of Canada. Moreover, MRC supports the BERR's three focus areas of addressing (1) the role of regulation as a driver of ocean innovation, (2) the regulatory and administrative barriers to environmentally sustainable growth, and (3) the development of agile regulations.

Addressing these questions is critical for the health of the marine renewables industry, and consequently, Canada's ability to reduce its emissions and fend off the effects of climate change already being felt worldwide. For oceans, climate change means acidification, warming, and the destruction of fish and marine habitats. Canada's oceans will not be spared this reality if climate change progresses and action is not taken to reduce our dependency on fossil fuels. Marine renewable energy sources, if supported and enabled by government, can help Canada reduce its emissions and, in the long term, mitigate the effects of climate change.

With the pressures of climate change, the chilling effect of a lack of regulatory certainty on the tidal industry, and Canada's first offshore wind lease slated for 2025 in Nova Scotia, the time to build a

transparent and predictable regulatory regime for the blue economy is now. In light of the above, MRC offers the following recommendations and answers to DFO's guiding questions on the BERR's Marine Renewable Energy and Environmental Protection Consultation Theme. In preparing this submission, MRC analyzed legislation, regulation, and guidance, reviewed guidance that is provided for fisheries authorizations and permitting, and consulted with industry members to better understand how the *Fisheries Act* (the *Act*) is being applied in practice to projects like tidal energy demonstrations. MRC also consulted with its members including tidal, offshore wind, wave, and river current energy developers working in Canada and internationally.

MRC hopes that this submission will be of assistance to DFO and the Treasury Board of Canada and would be happy to provide more detailed information on any of the recommendations. Thank you in advance for your consideration of this submission.

Sincerely,

Elisa Obermann, Executive Director
Marine Renewables Canada

BACKGROUND: CANADA'S MARINE RENEWABLE ENERGY SECTOR

Canada has some of the best tidal, wave, offshore wind, and river current energy resources in the world and they are largely untapped. Our marine renewable energy (MRE) resources offer enormous potential to contribute to net zero goals and sustainable economic development. In addition to the domestic opportunity from developing marine renewables, there is also the potential for Canada to export skills and expertise that can service an estimated 1300 GW global MRE market by 2050, valued at more than $1.8 trillion. As global green hydrogen demand increases, Canada also has an additional export opportunity to use its offshore wind resources for the production of green hydrogen and ammonia.

Canada has been building a MRE industry for the last decade. About $125 million has been invested by the public sector which has in turn, attracted an estimated $250 million of private sector investment. These investments have created new jobs and business in rural and remote parts of the country. Researchers and academic institutions have contributed to growing the knowledge around environmental, technical, and social questions impacting sector advancement. Technologies have been tested, refined, and progressed closer to commercial viability. Canadian suppliers and researchers have exported expertise gained from early projects to international markets. Overall, Canada is well recognized as a global leader in this sector – even at this early stage when projects are yet to be commercial or a major contributor to the electricity system.

The future potential for MRE to play a significant role in supporting Canada's environmental and economic goals will largely be dependent on the regulatory regime. Currently, despite over a decade of foundational R&D, investment, and policy development, instream tidal energy (tidal energy) projects are facing regulatory challenges and delays under the *Act*. Offshore wind holds huge potential but ensuring that Canada can attract investment and activity in a very competitive global offshore wind market will depend largely on regulatory certainty.

RESPONSE TO QUESTIONS ON THE BLUE ECONOMY REGULATORY REVIEW "LET'S TALK FEDERAL REGULATIONS" PLATFORM

1) Is Fisheries and Oceans Canada's current legislative and regulatory regime, including supporting policies, guidelines and practices clear and easy to navigate in the context of marine renewable energy?

1.1. Current Situation and Challenges in the Regulatory Regime for MRE

After many years of collaboration amongst government, industry, and researchers to lay the groundwork for tidal energy projects, Nova Scotia has become a unique jurisdiction worldwide for tidal energy development. The province has one of the best tidal resources in the world with the Bay of Fundy, supportive policies and legislation, and ongoing R&D to support informed decisions and technology development. All of these things have attracted the interest of technology and project developers

worldwide to test and prove their tidal technologies here. Currently, several tidal energy developers have been awarded licenses, power purchase agreements (PPA), and funding to develop projects in the Bay of Fundy. Project developers have also achieved significant progress in securing project financing based on these supportive policies and legislation with the presumption of timely and practicable regulatory approvals.

While there have been achievements and progress made, tidal energy development, even at a demonstration scale (less than 1 MW) is being severely impacted by a lack of regulatory clarity. The primary regulatory challenge MRC hears of often from its members and tidal developers is related to the *Act* and how a project can obtain an authorization for various phases of development under the legislation at play.

Although at a different stage of development in Canada, the development of offshore wind is also faced with regulatory challenges. The federal government has been working towards establishing Offshore Renewable Energy Regulations under the *Canadian Energy Regulator Act* and amending the Canada-Newfoundland Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (the *Accord Acts*) but it is unclear how other legislation and regulation like the *Act*, *Species at Risk Act* (*SARA*), and *Oceans Act* will apply to these projects. The BERR should act in parallel to the Regional Assessment of Offshore Wind for Newfoundland and Labrador and Nova Scotia (Regional Assessment) to identify what types of approvals, authorizations, permits, etc. will be required for offshore wind projects. Specific guidance should be developed to clearly communicate how transparent and objective risk assessments will be applied under different types of legislation such as the *Act*, as well as guidance on how to satisfy environmental monitoring requirements.

The current legislative and regulatory regime under the *Act* is not just unclear and unpredictable, it is creating major challenges in progressing even demonstration-scale projects (under 1 MW). A recent example of this is tidal developer, Sustainable Marine's, challenges to obtain regulatory approval for the first phase of its Pempa'q Tidal Project in the Bay of Fundy at the Fundy Ocean Research Centre for Energy (FORCE). After five years of working to obtain an authorization under the *Act*, the company withdrew its application despite having attracted significant public and private sector investment, including $28.5 million from Natural Resources Canada's Emerging Renewable Power Program (ERPP). The company also succeeded in demonstrating the first ever grid-connected floating tidal energy platform in Grand Passage, Nova Scotia, yet could not gain approval by DFO to test the device at FORCE.

This regulatory uncertainty will impact Canada's ability to attract investment to this sector. In consultation with members, MRC has identified some key areas of DFO's regulatory regime under the *Act* that are often unclear and/or challenging to navigate below.

1.2 Risk Assessment and Decision-making

Transparency & Flexibility. One of the key areas of improvement to DFO's regulatory regime identified by MRC member tidal developers is the need for a transparent risk assessment framework that is specific to the sector (i.e. tailored to the realities of emerging renewable energy technologies like tidal energy). The

lack of a public document that details the risk assessment methodology for MRE technologies has led to questions and concerns amongst industry on the transparency, objectivity, and consistency of the risk assessment process. MRC also questions how industry can be expected to develop plans and methods to mitigate and reduce risk if they don't have access to a standard risk assessment framework for the sector.

Currently, the only DFO risk assessment framework that MRC has been able to find[1] is outdated, adopts a problematic and narrow interpretation of the precautionary principle, and is not appropriate for emerging renewable energy technologies like tidal energy.

In 2012, Acadia University published a risk assessment framework specifically for tidal energy entitled "A Framework for Environmental Risk Assessment and Decision-Making for Tidal Energy Development in Canada"[2] which was prepared for DFO, along with the Government of Nova Scotia. This framework provides details and definitions specific to tidal energy technologies and projects. It appears that it was never adopted or implemented by DFO, but MRC believes this tool could be a starting point to develop an updated version that would go a long way in supporting transparent decision-making and project development.

Currently, it would appear DFO considers some tidal energy projects to pose a serious enough risk of fish death and/or negative effects on fish habitat that some projects should not receive an authorization, while others have been told they do not even require an authorization, only a letter of advice. Tidal developers do not understand what, if any, evidence DFO has to support the risk assessment and decision-making process leading to these confusing outcomes. Moreover, they are not being provided with clear avenues to address or mitigate these risks and move their projects forward.

MRC also recommends that risk assessment practices and requirements are reviewed and evaluated regularly to ensure that they are up to date and relevant for current technologies being used and consistent with international industry best practices. Given the emerging nature of many MRE technologies, the understanding of potential risks may also evolve as technologies and knowledge evolve. The industry needs a flexible and adaptive approach to regulation to flourish and contribute to Canada's net zero goals.

Consideration of Experience and Data from International Projects and Related Industries. While tidal energy is emerging in Canada and offshore wind is at the early stages of becoming a reality in Canada, MRE technologies have been successfully deployed internationally for decades. To date, industry has been told that processes under the *Act* cannot consider international data, which is understandable to a certain degree because every project has unique characteristics. However, it is extremely perplexing that DFO has voiced concerns about the risks of horizontal axis tidal turbines, for example, when globally there is growing body of data collected from active projects using this technology showing no detected harm to

[1] Fisheries and Oceans Canada. "*Practitioner's Guide to the Risk Management Framework for DFO Habitat Management Staff*": https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/343443.pdf.

[2] Acadia University. "A Framework for Environmental Risk Assessment and Decision-Making for Tidal Energy Development in Canada": https://fern.acadiau.ca/custom/fern/document_archive/repository/documents/179.pdf.

fish, other marine life, or the environment.[3]

The international data available on fish interactions and the effects of tidal devices on fish habitats ought to be considered, or at least offer guidance, when issuing authorizations, especially where similarities in technology allow for reasonable comparisons to be made. International data is particularly important given tidal developers, particularly in the Bay of Fundy, are largely not being given the opportunity to deploy devices and collect the data that would satisfy DFO's permitting consideration.

While offshore wind development in Canada is still a number of years away, this approach of considering or allowing international data and best practices to inform DFO's risk assessment and decision-making should be applied for all MRE technologies and projects. Offshore wind farms have been operational in Europe since the early 1990's. There is a wealth of data and best practices surrounding matters like regulation, environmental monitoring, and ocean user co-existence management. Canada does not need, nor does it have the time, to reinvent the wheel on MRE regulation.

Below are just a few examples of strategies implemented in Europe's offshore wind industry to meet stakeholders' needs and develop offshore wind in an environmentally friendly and collaborative manner. MRC recommends that DFO identify, capitalize and rely on existing international examples and data. Project MERMAID, an innovative multi-purpose off-shore platform planning, design and operations project, identified environmental benefits from different combinations of aquaculture and offshore renewable energy systems. This research resulted in several pilot projects run in Belgium, Germany, Spain, France, The Netherlands[4] and Portugal on molluscs, algae and multi-use offshore platforms. The PHAROS4MPAs Interreg Project blended blue economy and marine conservation goals documenting interactions between marine protected areas in the Mediterranean and offshore wind farms. The outcomes provided guidance on how to prevent or minimise environmental impacts. Finally, the BalticLines Interreg project brought together different coalitions in the Baltic Sea to define corridors for cables and pipelines that optimise use of space and reduce interference the fisheries.[5]

In a similar vein, DFO can draw from its experience with offshore oil and gas projects in Canadian waters to guide its approach to offshore wind, provided the risk assessment used is adequately tailored to the technological and operational realities of offshore wind farms and accounts for the environmental benefits of renewable energy. Given the upcoming expansion of the Canada-Nova Scotia Offshore Petroleum Board and the Canada-Newfoundland and Labrador Offshore Petroleum Board's (Offshore Energy Boards) mandate to include offshore wind, DFO should be able to easily draw on and benefit from institutional knowledge and memory about the effective regulation of offshore energy.

Mitigation Measures. Any risk assessment framework must leave room for and give adequate weight to

[3] TETHYS. "OES-Environmental 2020 State of the Science Report: Environmental Effects of MRE Development Around the World": https://tethys.pnnl.gov/publications/state-of-the-science-2020.
[4] European Commission. "Final Report Summary – MERMAID (Innovative Multi-purpose off-shore platforms: planning, Design and operation)": https://cordis.europa.eu/project/id/288710/reporting.
[5] Interreg Baltic Sea Region. "Coherent Linear Infrastructure in Baltic Maritime Spatial Plans": https://interreg-baltic.eu/project/baltic-lines/.

mitigation measures to avoid or reduce a project's effects on fish or fish habitat. Under the *Act*, DFO must consider mitigation and offsetting measures when determining whether to issue an authorization. Currently, it would appear that *any* risk to fish or fish habitat, regardless of the existence or non-existence of data to support that risk, can render a project ineligible for an authorization under the *Act*. DFO's risk assessment framework and approach to permitting must provide avenues for meaningful interactions to bridge gaps, reach a consensus or assist in reaching a conclusion that safeguards the fisheries environment while providing a path for clean, renewable energy development in Canada.

The Precautionary Principle. The precautionary principle is a central guiding principle of Canadian environmental policy and legislation, including the *Act* and the *Oceans Act*. However, it appears that there are different definitions and approaches of the precautionary principle across Canadian legislation, which may be leading to confusion by both industry and regulators on how it is and will be applied. The precautionary principle appears in multiple Canadian laws and is either not defined (as in the *Act*) or defined differently depending on the law:

The *Fisheries Act*, s. 2.5(a)

> **2.5** Except as otherwise provided in this Act, when making a decision under this Act, the Minister may consider, among other things,
>
> **(a)** the application of a precautionary approach and an ecosystem approach;

The *Oceans Act*, s.30(c)

> *"…the precautionary approach, that is, erring on the side of caution."*
>
> [Our emphasis]

The *Canadian Environmental Protection Act* (*CEPA*), preamble

> *"Whereas the Government of Canada is committed to implementing the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation;"*
>
> [Our emphasis]

The above definition found in *CEPA* mirrors that which appears in DFO's policy document, the *Practitioner's Guide to the Risk Management Framework for DFO Habitat Management Staff* [6] as well as

[6] *Supra* note 1.

the UN *Rio Declaration on Environment and Development* (*Rio Declaration*).[7] However, it is unclear whether this definition is compatible with or contradicts that found in the *Oceans Act*. This uncertainty in the legislative and policy basis of the precautionary approach should be resolved.

Currently, DFO uses the precautionary approach in their risk assessment of tidal projects vis-à-vis their effect on fish and fish habitat. Based on the experience of some tidal energy projects, it would appear that DFO has interpreted the precautionary approach to mean that caution must be taken when considering developing tidal energy projects because there is scientific uncertainty about their effects on fish and fish habitats and that this justifies inaction – inaction here meaning the failure to develop tidal projects, particularly in the Bay of Fundy. This interpretation is problematic because it does not consider the broader issues of climate change and environmental degradation – issues which are at the crux of the precautionary principle and are an important aspect of DFO's mandate, which goes beyond fisheries and includes the entire ocean environment and related industries.

The precautionary principle was enshrined in international law through the *Rio Declaration* to ensure that while there remains scientific uncertainty around anthropogenic climate change, this uncertainty should not prevent us from taking action that combats climate change:

> "Its core elements are the need for environmental protection; the presence of threat or risk of serious damage; and the fact that a lack of scientific certainty should not be used to avoid taking action to prevent that damage.[8]

To constrain the idea of serious or irreversible damage in our legislative definitions to damage to fish and fish habitats, fails to capture the broader climate lens inherent to the precautionary principle and the contribution to the fight against climate change that MRE projects present. The serious or irreversible damage that ought to be considered when assessing the risk of MRE projects pose is the damage that will be caused by the effects of climate change if we do not decarbonize our electricity sources.
MRC recommends the precautionary approach be interpreted to *encourage*, not discourage the development of MRE projects, including prospective offshore wind projects, even where there is a lack of full scientific certainty about their effects. Offshore wind and tidal projects will help to prevent further environmental degradation and combat climate change, which should be a primary consideration of a precautionary approach to risk assessment. In addition, the intent of the precautionary principle can also be addressed through robust monitoring of project impacts, adaptive management, and the implementation of mitigation measures shown to be effective in other jurisdictions. Through its regulation of MRE, DFO has an opportunity to mitigate the damaging effects of climate change on our oceans by allowing these projects to demonstrate their potential.

---

[7] United Nations General Assembly. "Report of the United Nations Conference on Environment and Development": https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf.
[8] The Principles of International Environmental Law, Philippe Sands, Jacqueline Peel et al., Cambridge University Press, 3rd ed., 2012.

In light of the above, MRC recommends the following to improve DFO's regulatory and legislative regime for MRE:

1.2 That DFO adopt an updated risk assessment framework for authorizations under the *Act*, which:

- Is transparent, flexible, and appropriate for emerging renewable energy technologies;
- Considers the body of international data on tidal energy and fish habitat, as well as lessons-learned and best practices from the international MRE industry and the Canadian offshore oil and gas industry;
- Provides projects a path to operation by considering reasonable mitigation and offsetting measures, as well as the ability to deploy, monitor, and adapt;
- Adopts a climate lens by:
    - Considering the risks of non-action – i.e. of failing to deploy MRE;
    - Considering MRE's positive environmental impacts; and
- Interprets the precautionary approach as promoting the adoption of renewable energy projects despite a lack of scientific uncertainty about their effects because of their potential to mitigate serious and/or irreversible harm resulting from climate change.

2) How could the project-specific review processes be improved for marine renewable energy projects, while still meeting Fisheries and Oceans Canada's international commitments and legislative regulatory requirements for environmental protection?

The following recommendations apply to DFO's project-specific review processes for all MRE projects.

2.1 Coordinated and Harmonized Joint Management Processes

A harmonized joint management regime for project-specific review processes is needed to establish an efficient and effective regulatory pathway for the marine renewables industry. This includes the balance of federal and provincial interests as well as inter-departmental interests within federal or provincial governments, including DFO.

Tidal energy development typically takes place in provincial waters, but federal legislation such as the *Act* and *SARA* still applies. Past experience in Nova Scotia supports the concept of a One Window Committee, established to ensure all federal and provincial regulators understand the project criteria and can identify regulatory requirements. MRC encourages DFO to participate in any future one window processes for tidal energy projects to ensure that regulatory processes are coordinated, effective, and efficient.

For offshore wind, it is currently unclear how DFO's permitting process under the *Act* will interact with requirements set out by the Offshore Energy Boards and existing requirements under the *IAA*, *CEPA*, *SARA*, or those resulting from the Regional Assessment to name a few. Coordination amongst the departments administering these laws and regulations, in particular concerning the timelines associated with the various regulatory requirements, will be required to ensure offshore wind projects are not impeded by regulatory uncertainty and unnecessary duplication. It would be extremely detrimental to

projects if, for example, the timelines for an impact assessment process under the *IAA* was treated entirely separately from DFO's authorization process under the *Act* and *SARA*. It is imperative that these processes are coordinated such that they occur in parallel, not sequentially. This will require a harmonized joint-management process between governmental departments to ensure overall permitting timelines for offshore wind projects are reasonable.

2.2 Adopt a Climate Lens when Applying the *Fisheries Act*

Currently, without a clearly identified regulator and regulatory pathway for tidal energy, DFO's powers to grant authorizations under the *Act* have rendered it by all intents and purposes, the de facto regulator for tidal energy. MRC commends DFO's efforts to understand the effects of, and work with, an emerging marine technology and understands DFO must apply the *Act* in accordance with its purpose, in particular the conservation and protection of fish and fish habitat. MRC nevertheless wishes to emphasize the crucial role MRE sources can play in the broader fight against climate change. Rising global temperatures seriously affect the health of the oceans and of the marine life within them, including fish. Decarbonization is a critical piece of the fight against climate change and with energy demands only rising, there is no choice but to replace carbon-intensive energy sources with those which are clean and reliable, like MRE.

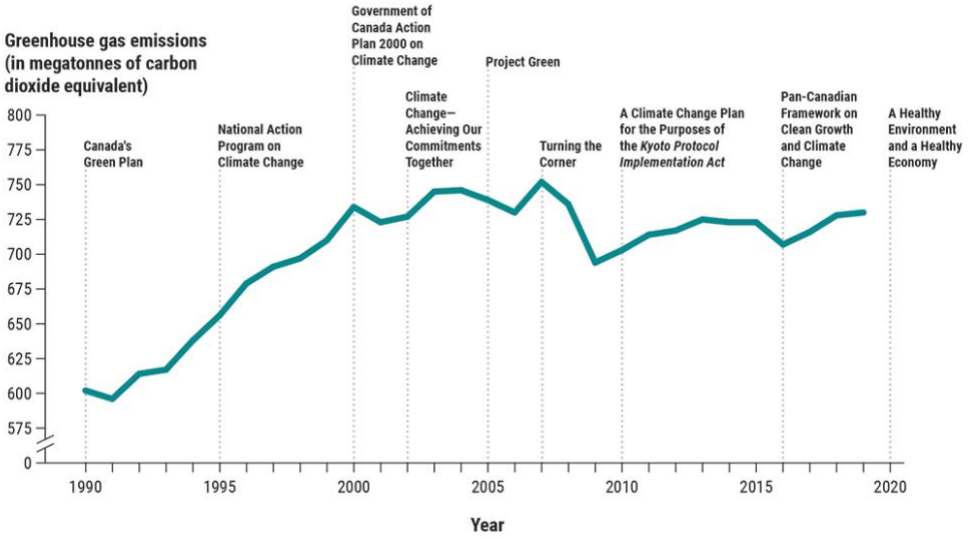
The above consultation question highlights that DFO must consider its international commitments as it approaches its work and the individual projects which it reviews. These international commitments include several agreements discussed in more detail below, which require the Canadian government, including DFO, to act on climate change by reducing GHG emissions. Moreover, DFO's Minister was mandated by the Prime Minister to "seek opportunities within your portfolio to support our whole-of-government effort to reduce emissions, create clean jobs and address the climate-related challenges communities are already facing."[9] While DFO must work within the confines of the legislation which it applies, it must equally consider its domestic and international environmental commitments while doing so. MRE is a clear opportunity in DFO's portfolio to support Canada's government-wide effort to reduce emissions. DFO should recognize the importance of MRE sources for the fight against climate change and consequently the health of the planet, oceans, and fish.

With respect to meeting Canada's international commitments, as a signatory of the Paris Agreement, Canada has committed to reduce its GHG emissions by 30% below 2005 levels by 2050 and to take action to "stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." The Paris Agreement further asks countries to enhance their GHG reduction targets over time, which Canada has done through its 2030 Emissions Reduction Plan, committing Canada to hitting net zero by 2050 and a net zero grid by 2030. Through the United Nations' 2030 Agenda for Sustainable Development, which Canada signed in 2015, Canada has also committed to "take urgent action to combat climate change and its impacts" including providing affordable clean energy (Goal 7) and supporting industry, innovation and infrastructure (Goal 9).

[9] Office of the Prime Minister of Canada. "Minister of Fisheries, Oceans and the Canadian Coast Guard Mandate Letter": https://pm.gc.ca/en/mandate-letters/2021/12/16/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter.

Finally, Canada is also a member of the Intergovernmental Panel on Climate Change (IPCC), contributing to the IPCC's scientific assessment of climate change. The IPCC's latest report, released in March 2023, made clear that even the decarbonization targets described above are not enough and that high-emitting countries like Canada need to hit net zero before 2050.[10]

As the graph below demonstrates, despite these domestic and international commitments, Canada's GHG emissions have only increased over the period of time during which these commitments have been made:



[11]

As a federal government department with the power to contribute to Canada's efforts to reduce its emissions, DFO must consider the potential MRE projects hold for these efforts. Having MRE projects commercially operational would directly contribute to reducing Canada's emissions by providing renewable energy to the grid and for export, thereby contributing to our net-zero goals. MRC recommends that DFO consider not only its international commitments but adopt a climate lens more broadly when reviewing MRE projects. This means considering the emissions reductions that a marine renewable project could lead to as well as the costs of non-action – i.e. of failing to support a marine renewable project – for Canada's commitments as well as the planet. Energy demand is only increasing and as Canada decarbonizes its grid and economy, less renewable energy in the grid means either less total available energy or simply more carbon-intensive energy sources.

2.3 Clear Policy Guidance and Dedicated Staff

Currently, DFO's authorization process is opaque and difficult for developers of MRE projects to navigate. Providing clear policy guidance and ensuring internal capacity exists within DFO to work with industry to understand requirements is integral to the success of projects and sector development. For example, there is currently no guidance addressing what activities will require offsets and/or compensation for offshore wind projects, or whether there will be a baseline of activity prior to offsetting being required.

[10] Intergovernmental Panel on Climate Change. "IPCC Sixth Assessment Report": https://www.ipcc.ch/report/ar6/wg2/.
[11] Officer of the Auditor General of Canada. "Lessons Learned from Canada's Record on Climate Change": https://www.oag-bvg.gc.ca/internet/English/att__e_43947.html.

Gathering the information required to meet DFO's regulatory requirements and designing effective and thoughtful mitigation and offsetting measures takes time. Without guidance and transparency in DFO's authorizations process, the sector has, and will, experience unnecessary delays which directly affect the commercial and financial viability of projects.

Another important aspect of implementing clear policy guidance for MRE projects is having dedicated staff who are responsible for the development and evaluation of policy and strategy for the sector. Currently, regulatory and enforcement branches of DFO are handling *all* aspects of MRE in addition to their regulatory responsibilities. Without established clear policy, this means these branches are also designing and applying policy without adequate tools to do so effectively. To truly facilitate sector development, other functions are needed; namely, human resource capacity which can not only interpret and implement the *Act* but also recognize policy challenges, stay informed on international industry development and best practices, and act as an industry expert for both colleagues and external stakeholders like developers.

2.4 Best Practices and Lessons Learned: International Data

The recommendations outlined in Section 1.2 above as they pertain to international data also apply to the project-specific review process. International data and best practices ought to be considered valid as part of project applications for authorizations under the *Act*, especially where equivalent data is non-existent in Canada.

In light of the above, MRC recommends the following to improve DFO's project-specific review processes for MRE projects:

2.1 Contribute to coordinated and harmonized joint-management processes, which:

- Follow the Federal-Provincial Accord Model for integrating federal and provincial interests for offshore wind and recognizes the Offshore Boards as lead regulators for offshore renewables;
- Include a multi-departmental committee which plans for integrated decision making between DFO, Natural Resources Canada, Environment and Climate Change Canada, Transport Canada, the Offshore Energy Boards, and any other departments of relevance to the regulatory process for MRE projects;
- Ensure permitting and approval timelines are coordinated between departments, such that these timelines can occur in parallel; and
- Incorporate harmonization and joint management best practices from the offshore oil and gas industry, such as the Atlantic Energy Roundtable.[12]

2.2 Adopt a climate lens when applying the *Fisheries Act* to MRE projects, considering:

- DFO's international environmental commitments, environmental protection requirements,

[12] Canadian Intergovernmental Conference Secretariat. "News Release – Atlantic Energy Roundtable Sets the Stage for Offshore Energy Investment": https://scics.ca/en/product-produit/news-release-atlantic-energy-roundtable-sets-the-stage-for-offshore-energy-investment/.

and its ministerial mandate; and

- The costs of non-action, taking into account the positive environmental effects of MRE projects for emissions reductions efforts and climate change mitigation.

2.3 Develop clear and transparent policy guidance for authorizations under the *Act* as well as tools and templates to be made available in advance of project applications being submitted.

2.3.1 Increase DFO's capacity for MRE projects with dedicated staff/resources focused on MRE strategy and policy who can work with industry to develop policy, as well as provide guidance to project developers before and throughout the application process.

2.4 Consider international industry standards, best practices, and data during project-specific review processes to the extent possible and especially where the same data does not yet exist in Canada.

3) What are some key science and data gaps related to the impacts and/or benefits of marine renewable energy projects?

Most of the MRE sector, with the exception of offshore wind, is at a pre-commercial stage, with few long-term deployments that have had the opportunity to collect data on potential environmental effects. While research to date is positive, it is not extensive, and some uncertainty remains. This is largely an industry-wide challenge that continues to be assessed by researchers, regulators, and industry. The most recent "State of the Science"[13] report, published in 2020, summarizes the potential environmental impacts and knowledge from experience to date. Potential impacts include:

- ***Collision risk**:* "Tidal and river energy devices may pose a risk of collision to marine mammals, fish, and diving seabirds. To date, there have been no observations of a marine mammal or seabird colliding with a turbine, and the limited number of interactions of fish in close proximity to a turbine have not resulted in obvious harm to the fish. [However] it is difficult to determine how well marine mammals, fish, and seabirds may be able to sense, react to, and avoid an operating turbine."

- ***Underwater noise and disturbance**:* "Evidence suggests that underwater noise emitted from operational MRE devices is unlikely to significantly alter behavior or cause physical harm to marine animals."

- ***Changes to habitats**:* "Overall, changes in habitat caused by MRE devices and arrays are likely to pose a low risk to animals and habitats if projects are sited to avoid rare or fragile habitats."

[13] Copping, A; Hemery, L: *OES-Environmental 2020 State of the Science Report: Environmental Effects of MRE Development Around the World*: https://tethys.pnnl.gov/publications/state-of-the-science-2020.

- *Effects of electrical cables:* "The evidence base to date suggests that the ecological impacts of EMFs emitted from power cables from single MRE devices or small arrays are likely to be limited, and marine animals living in the vicinity of MRE devices and export cables are not likely to be harmed by emitted EMFs."

Central to retiring outstanding questions around environmental effects will be monitoring and data gathering that can only happen in tandem with the deployment and demonstration of devices. An adaptive management approach that allows developers to deploy, monitor, and adapt as needed would allow for this necessary data collection. While there are unknowns and potential risks at this stage, those concerns must also be weighed against other environmental risks such as climate change which is already known to negatively impact ocean biodiversity.

With regards to science and data gaps that do and will inhibit the permitting process for MRE projects in the Canadian context specifically, MRC received the following feedback from its members:

A) Tidal Energy

- *Collision risks:* A better understanding of how fish respond to the presence of operational tidal turbines at elevated flow speeds (> 3 m/s) is required. Fish can exhibit avoidance or evasion of turbines in low to moderate current speeds, but questions remain about their ability to detect and respond to turbines at higher flow speeds.

- *Accurate population estimates for various fish species:* Accurate estimates of population size for the various species of interest are needed to in turn generate accurate estimates of encounter rates between fish and tidal turbines. Currently, tidal developers must rely on DFO stock assessments, which are not always accurate. Moreover, DFO stock assessments are focused largely on commercial fisheries species with harvest targets and are sparse where non-commercial fish species are concerned, like in the Minas Passage for example. This is essential information for tidal developers that can be difficult and costly to obtain.

- *Monitoring capabilities:* There is currently little understanding of the capabilities and limitations of off-the-shelf monitoring technologies in high flows for monitoring interactions between operational turbines and fish. Where technologies hit a threshold flow rate (beyond which their efficacy is reduced), modelling is required to help fill in the gaps (e.g., 4-5 m/s).

- *The risk of inaction:* DFO has expressed a lot of concern about the potential negative effects of turbines on fish in the short term, despite the international and local evidence to counter this. However, there has been no effort to consider the potential negative effects of not advancing MRE development and the consequences of climate change for fisheries in the long term. This long-term climate lens is missing from DFO's analysis and therefore there is little scientific data about MRE's role in emissions reductions and climate change mitigation.

B) Offshore Wind

- *Habitat offsetting and banking:* It is currently unclear to what extent habitat offsetting will be possible and/or required for offshore wind farms that are found to have adverse impacts on fish or fish habitat. In particular, whether all offshore wind projects will be required to perform habitat offsetting or whether this will be required only after a certain number of turbines have been installed. Moreover, more data is required about the regional availability of eligible habitats for offsetting, and in this vein, whether habitat banking will be possible in the event that regional habitats become unavailable.

- *Positive effects of offshore wind farms on fish and fish habitats:* As noted above, there is currently little data on the positive effects renewable energy projects like offshore wind can have on their environment with respect to emissions reductions and climate change mitigation. At a more local level, scientific data is required on the restocking potential of offshore wind farms, which have been shown to foster and create fish habitats.

In addition to the above identified science and data gaps related to the impacts and/or benefits of MRE projects, MRC recommends the following actions and strategies to fill those and other gaps:

3.1 Capitalize on the existing knowledge base (government surveys, offshore oil and gas projects, strategic environmental assessments) by consulting and considering existing data that has been collected through comparable projects and assessments in Canada and internationally.

3.2 Develop programs and/or policies to render existing science and data publicly available (e.g. the Marine Energy Toolkit[14] and Insight Oilco[15]).

3.3 Coordinate with the IAAC to ensure data collection is occurring simultaneously and in parallel with the Regional Assessment, as opposed to sequentially.

3.4 Develop a policy that establishes a baseline level of environmental monitoring data which would be considered sufficient as well as an effective approach to data gathering, in collaboration with other governmental departments.

3.5 Develop a policy that establishes a correlation between data that may be missing from a project application and the risk/potential effects resultant from that lack of data, to ensure project assessments are proportional to their relative risk and that projects are not unduly delayed. This policy should also allow for reasonable and proportional mitigation measures where data is missing, long term monitoring, and other commitments to help projects move forward responsible when missing data does not present a high risk.

[14] Marine Energy Environmental Toolkit. "About the Marine Energy Environmental Toolkit": https://marineenergy.app/about.html.
[15] Insight OilcoNL: https://insight.oilconl.com/ReportViz/Index.

4) What lessons could we learn from past assessments or pilot implementations of marine renewable energy projects domestically; internationally?

Based on experience in tidal and wave energy in Canada, as well as international lessons learned, MRC offers the following insight on bests practices and lessons learned:

4.1 Establishment of guidance and a common understanding of how permitting decisions are made

As MRE is a newer technology to be deployed in Canada, regulations and processes are being applied for the first time on technologies that are emerging or not yet used in Canada. As a result, projects to date have been challenged by the lack of a clear regulatory framework which has led to project delays (by years, not months), significant financial costs and implications, concerns from stakeholders and rights holders, and even project cessation. With respect to tidal energy, projects to date have been challenged by unclear requirements and a lack of guidance on progressing from the deployment of one device to multiple devices. If not addressed, current practices under the *Act* will continue to be detrimental to innovation, economic development, and addressing climate change in Canada.

This regulatory clarity challenge is not unique to Canada – other jurisdictions have grappled with many of the same issues when it comes to environmental effects and uncertainties of emerging technologies like instream tidal and wave energy. Some have established guidance and roadmaps on environmental permitting and monitoring requirements that provided the industry with more certainty, including:

- ***Welsh Government:*** The Welsh Government and Natural Resources Wales (NRW) have established permitting guidance to assist with MRE projects and provide clear, transparent, and specific advice to industry on how projects will be assessed and permitted.

  This includes:
  - ***MRE: environmental information notes***.[16] This series provides a shared understanding of how the best available science and evidence is currently applied to key permitting issues on topics such as:

    1. Collision risk for animals around turbines;
    2. Risk to marine animals from underwater noise;
    3. Risk to marine animals from electromagnetic fields emitted by electric cables and MRE devices;
    4. Changes in benthic and pelagic habitats;
    5. Changes in oceanographic systems;
    6. Encounters of marine animals with mooring systems and subsea cables;
    7. Environmental monitoring technologies and techniques for detecting

[16] Welsh Government. "MRE: environmental information notes": https://www.gov.wales/marine-renewable-energy-environmental-information-notes.

interactions of marine animals with MRE devices;
8. Data transferability; and
9. Cumulative impact assessment.

- ***Monitoring interactions between animals and tidal energy devices***. The Welsh Government commissioned a review of current and emerging monitoring tools and methodologies to identify the monitoring technologies which are most suitable for monitoring interactions between key marine animals (cetaceans, seals, fish, and birds) and tidal (stream and range) renewable energy developments around Wales. This report is posted on the government website and is used to provide guidance to both regulators and industry. This is a similar initiative to the Pathway Program which was led by the Offshore Energy Research Association (OERA) (now Net Zero Atlantic); however, it is unclear to industry how the results of that program are being used by DFO and therefore, it isn't providing the transparent and clear guidance needed for all entities.

MRC recommends that DFO establish clear guidance for the permitting of MRE projects that is developed through consultation with industry and other relevant entities. It should be posted publicly on its website and reviewed/evaluated on a 1–2-year basis to ensure that it is responsive to the evolving nature of this industry and MRE technologies.

4.2 Collaborative environmental research initiatives to help de-risk permitting and project development

In other sectors, environmental impact assessments are based upon knowledge and data from past experiences. This allows regulators to put rules in place that protect against established risks, while still allowing activities to go ahead. But this knowledge base is still being built up for MRE and in particular, tidal and wave energy, which are not as mature as offshore wind. To date there have been relatively few MRE deployments in Canada and therefore, no comprehensive body of evidence locally/domestically that regulators can use as a basis for permitting decisions.

A stronger evidence base can be provided via coordinated research projects that monitor priority environmental impacts of projects in Canada and use consistent methodologies. In the UK, there are several good examples of this type of joint industry-government collaborative environmental research program:

- ***Offshore Renewables Joint Industry Programme (ORJIP)***.[17] ORJIP Ocean Energy is a UK-wide collaborative environmental research programme, funded by government (the Crown Estate, Marine Scotland, Scottish Natural Heritage, the Welsh Government, and Natural Resources Wales), with the aim of reducing consenting risks for wave and tidal projects. The programme aims to ensure that the key permitting risks for early array (multiple device) deployments in the wave and tidal sectors are addressed by facilitating a strategic, coordinated, and prioritised approach to monitoring and research which is endorsed by industry and regulators. The

[17] Offshore Renewables Joint Industry Programme (ORJIP): http://www.orjip.org.uk/.

objectives of ORJIP are to:

- help organisations whose role it is to fund and manage research to do so efficiently and effectively by bringing together knowledge and expertise on needs and practicalities from industry, regulators, etc.;
- make this knowledge available in a way that can be readily understood and acted upon;
- provide a funded Secretariat to coordinate creating and sharing the information and encourage action (one Secretariat to cover both the wave and tidal work streams); and
- support project developers by coordinating research and monitoring to ultimately assist with commercialisation.

ORJIP works to identify key permitting issues and risks[18] and determine where research can help reduce uncertainty around these key consent issues at a strategic level. High priority strategic research projects have been scoped to support the development of research proposals and focus on the following themes: collision risk, underwater noise, displacement, socioeconomics, regulatory, shipping and navigation.

- ***Collaborative Offshore Wind Research into the Environment (COWRIE).***[19] COWRIE was set up by the Crown Estate as an independent body to carry out research into the impact of offshore wind farm development on the environment and wildlife. It has since evolved into a charity which gained global recognition for its scientific and educational work. The collaboration has since ended, but the research conducted throughout the course of the program on 50 projects remains valuable.[20]

FORCE's Risk Assessment Program (RAP) is a great example of a research initiative that focuses on a priority research issue that is hampering the permitting and progress of tidal energy in the Bay of Fundy. It was designed to support greater regulatory clarity around tidal project development by developing a science-based and transparent tool to address a key question in the permitting process: estimating the probability that valued fish will encounter an offshore energy device at the FORCE site. But, more research and collaboration amongst industry and government is needed to focus on priority environmental research areas, as well as the financial and human resource capacity to carry out the work over a multi-year timeline.

MRC recommends the establishment of a Government of Canada funded joint industry-government collaborative environmental research initiative aimed reducing permitting risks for MRE projects (I.e. tidal, wave, and offshore wind). However, MRC would like to emphasize the importance of efficiency and timeliness to the MRE industry. Such an initiative should be established to occur *in parallel* with MRE project development so that the real-world information gathered by these projects on mitigation measures and impact-minimization can inform any research initiatives, and vice-versa. Research combined with real-world pilot programs has the best chance of yielding accurate and relevant results.

---

[18] ORJIP. "Strategic Research Projects": http://www.orjip.org.uk/projects.
[19] Collaborative Offshore Wind Research into the Environment (COWRIE): https://www.offshorewindfarms.co.uk/pages/cowrie/cowrie_explained/.
[20] TETHYS. "Collaborative Offshore Wind Research into the Environment (COWRIE)": https://tethys.pnnl.gov/organization/collaborative-offshore-wind-research-environment-cowrie.

4.3 Consider the Use of Existing Monitoring Data, Results, and Strategies

Drawing from the challenges faced by tidal developers in Nova Scotia who often cannot provide the level of environmental monitoring data required by DFO without having devices in the water to gather that data, DFO ought to consider monitoring data from existing European and US wind farms and tidal projects to understand if assessed risks are accurate and/or mitigation measures are effective for MRE projects. The implementation of viable mitigation measures to address concerns should factor into approvals and allow for streamlining pre-construction monitoring requirements.

Subsidiarily, DFO should allow for the replication of study designs from other jurisdictions that have demonstrated environmental effects to show consistency. For the tidal industry, this will of course require devices to be in the water in order to replicate studies. Thus ultimately, the paradox that the tidal industry finds itself in – i.e. where DFO is seeking an understanding of the effects of tidal turbines on fish but won't permit the deployment of the very devices that are necessary to acquire the required data to address that issue – must be resolved.

DFO's current approach to allow one device in the water at a time without any certainty of when the next device can be deployed is inefficient and continue to has dire consequences for individual projects and overall investment in the industry. DFO could instead borrow from international best practices and implement something similar to Marine Scotland's Survey-Deploy-Monitor approach to tidal energy development.[21] This is a sound, adaptive management-based approach to facilitating growth of the MRE sector while still taking into consideration the core elements of the precautionary approach. MRC recommends DFO consider international data as well as the replication of study designs from other jurisdictions when evaluating MRE project authorizations.

4.4 Regulatory pathway that allows for multiple device deployments using an adaptive management approach

Although Canada has yet to deploy more than one tidal device at a time, other jurisdictions are doing this with success, as demonstrated in the below example.

MeyGen Tidal Project (Scotland)

The MeyGen[22] instream tidal energy project being developed by SIMEC Atlantis Energy Ltd. in Scotland was awarded an Agreement for Lease by the Crown Estate for 398MW of installed instream tidal energy capacity. It is being permitted in two separate phases. Phase 1 has been permitted and is sub-divided into three further phases; 1A, 1B and 1C.

Phase 1A is an operational 6MW demonstration array, which comprises four 1.5MW turbines installed as

---

[21] TETHYS. "Survey, Deploy and Monitor Licensing Policy Guidance": https://tethys.pnnl.gov/publications/survey-deploy-monitor-licensing-policy-guidance.

[22] TETHYS. "MeyGen Tidal Energy Project Phase 1": https://tethys.pnnl.gov/project-sites/meygen-tidal-energy-project-phase-i.

part of MeyGen's "deploy and monitor strategy". All the turbines are upstream, three-bladed, horizontal-axis machines, fully submerged and mounted on gravity-base foundations resting on the seabed:

- 1 x Atlantis Resources Limited AR1500: with a rated capacity of 1.5MW at 3.0 m/s, a rotor diameter of 18 m, and is designed to withstand the extreme environmental conditions expected to be encountered in the Pentland Firth in Scotland.
- 3 x Andritz Hydro Hammerfest HS1500: consisting of a horizontal axis rotor (18 m rotor diameter), pitched blades and yaw feeding a variable speed conventional generator via a gearbox and reaches rated power at current speeds of 3 m/s.

Phase 1B (known as Project Stroma) comprises a subsea hub installed in September 2020, which allows multiple turbines to be connected to a single power export cable. This will significantly reduce the costs associated with grid connection. The length of power export cable as well as the amount of onshore conversion equipment required for grid connection will be significantly reduced, as will the amount of horizontal directional drilling and the amount of vessel time required for cable installation. Project Stroma will connect two additional Atlantis AR2000 turbines via the new subsea hub to a single power export cable which will then be connected via the MeyGen substation to the National Grid.

MeyGen has received all environmental permits, all necessary permission and grid capacity to build out Phase 1C, which aims to add another 49 (73.5 MW) turbines, bringing the total capacity for Phase 1 to 86 MW.Mitigation and best practice measures were outlined in MeyGen's Environmental Statement which was approved by Marine Scotland.

Recognizing that every project location and criteria are different, which has different implications for marine life and environment, it still appears that other governments are finding ways to permit multi-device projects and are implementing adaptive management approaches to monitoring and mitigation.

MRC recommends that DFO develop a regulatory approach that allows for multi-device deployment with reasonable, clear, and transparent guidelines and timelines as other jurisdictions have been able to accomplish. In conjunction with this, an adaptive management approach would ensure that monitoring data informs mitigation efforts.

4.5 International experience in offshore wind

Offshore wind is growing quickly, with approximately 54.9 GW deployed by the end of 2022 and is estimated to reach 260 GW in capacity by 2030.[23] Denmark, China, Germany, and the UK were some of the first countries to engage in offshore wind, and to date about 90% of the global installed offshore capacity is commissioned in the North Sea. Other countries are also working quickly to enter the market: France has increased its annual offshore wind tendering target to 1 GW until 2028; Japan has set a target

[23] United States Department of Energy. *Offshore Wind Market Report: 2022 Edition*: https://www.energy.gov/sites/default/files/2022-08/offshore_wind_market_report_2022.pdf.

of 45 GW by 2040 and Taiwan, a target of 15GW by 2035.[24] The United States has targeted 30 GW by 2030.[25]

Given the breadth and depth of global offshore wind experience, MRC encourages DFO as well as other federal regulators to consider best practices, lessons learned, and data of other countries. While this is a new sector for Canada, there are decades of international experience that can help inform the regulatory regime for offshore wind in Canada.

MRC recommends that DFO increases its knowledge and understanding of international offshore wind best practices in relation to its mandate under the *Act, Species at Risk Act,* and *Oceans Act,* and identify practices and models that will ensure effective and efficient regulation of Canada's offshore wind sector.

In summary, MRC recommends the following with regards to lessons learned and best practices from both domestic and international experience:

4.1 Establish clear guidance for the permitting of MRE projects that is developed through consultation with industry and other relevant entities. It should be posted publicly on its website and reviewed/evaluated on a 1–2-year basis to ensure that it encompasses the evolving nature of this industry and MRE technologies.

4.2 Establish a Government of Canada funded joint industry-government collaborative environmental research initiative aimed reducing permitting risks for MRE projects (i.e. instream tidal, wave, and offshore wind).

4.3 Consider international data as well as the replication of study designs from other jurisdictions when evaluating MRE project authorizations.

4.4 Develop a regulatory approach that allows for multi-device deployment with reasonable, clear and transparent guidelines and timelines as other jurisdictions have been able to accomplish. In conjunction with this, an adaptive management approach would ensure that monitoring data informs mitigation efforts.

4.5 Increase DFO's internal knowledge and understanding of international offshore wind best practices in relation to its mandate under the *Act, Species at Risk Act*, and *Oceans Act*, and identify practices and models that will ensure effective and efficient regulation of Canada's offshore wind sector.

[24] Offshore Wind Biz. "Taiwan Drafts Plan for Further 5 GW of Offshore Wind": https://www.offshorewind.biz/2021/05/11/taiwan-drafts-plan-for-further-5-gw-of-offshore-wind/.
[25] US Department of Energy. "Energy Secretary Granholm Announces Ambitious New 30GW Offshore Wind Deployment Target by 2030": https://www.energy.gov/articles/energy-secretary-granholm-announces-ambitious-new-30gw-offshore-wind-deployment-target.