CANADA'S NEW OCEAN ECONOMY:

CHARTING A COURSE FOR GOOD GOVERNANCE OF EMERGING OCEAN RESOURCES

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September 2017

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INTRODUCTION

Atlantic Canada is at a turning point. From earliest times, Atlantic Canada's history and economic development, both its ups and its downs, have been inextricably linked to the ocean, through fishing, transportation, offshore oil and gas or other traditional ocean industries. There is an immediate opportunity for Atlantic Canada to build on its oceans expertise and create a globally competitive ocean and marine resources industry and associated innovation ecosystem. This opportunity can reverse the pattern of many decades of either slow or no growth in Atlantic Canada. However, taking advantage of this opportunity requires the implementation of robust and comprehensive regulatory regimes for the safe and sustainable development of new ocean resources.

We propose new regulatory regimes for ocean resource activities in Atlantic Canada, focusing on wind, tide, waves and aquaculture.[1] Intertwining renewable energy and aquaculture – two vastly different ocean activities – in a single proposal may seem incongruous. However, a common obstacle hinders the development of both these ocean resource industries: the absence of regulatory conditions permitting their safe and sustainable development outside provincial territory. Despite significant differences between these industries, the same regulatory framework will best overcome this common obstacle: a comprehensive and responsive regulatory regime based on the joint federal-provincial system that has governed Atlantic Canadian offshore oil and gas activities for the last several decades.

We first contrast the opportunities, including a look ahead to developing ocean technologies such as remote operated vehicles, remote sensors and data collection, with the current state of the renewable energy and aquaculture industries in Atlantic Canada. We then describe how other countries have created and developed these industries. Next, we review the international and domestic laws necessarily to shape any Atlantic Canadian regulatory framework for ocean resource activities. Finally, we propose a framework for comprehensive and responsive ocean-based renewable energy and aquaculture regimes, including a description of the constitutional mandate for federal involvement, the regulatory objectives of such regimes, and the rationale for channeling benefits to the provinces of Atlantic Canada. Much like the offshore oil and gas regime, our proposal gives significant shared control over these ocean resource activities to Atlantic Canadians.

Global macro-economic and demographic trends point to the world's oceans figuring much more prominently in meeting foreseeable needs of a growing global population and warming planet. Currently, one billion people depend solely on seafood for protein while 2.9 billion depend on seafood for at least 20 percent of their protein.[2] Worldwide fish capture production was 93.4 million tons in 2014.[3] Global aquaculture production totaled 73.8 million tons in 2014, the first year in which aquaculture provided more fish for human consumption than did wild capture fisheries.[4]

Likewise, renewable energy from ocean sources such as tides, offshore wind and waves promise a secure and predictable supply of carbon-free electricity, particularly for the high demand eastern seaboard of the United States. For example, tidal power is clean, renewable and, unlike wind and solar power, perfectly regular. The estimated theoretical potential of the Bay of Fundy tidal energy is up to 60,000 megawatts

[1] To distinguish traditional oil and gas and fisheries activities from the ocean-based renewable energy and aquaculture that are the focus in this paper, we will refer to renewable energy and aquaculture collectively as "ocean resources" and "ocean resource activities." In order to keep this paper to a reasonable length, we have not discussed other ocean-based resource development such as deep sea mining and ocean thermal exchange technology, as those and other developments are, as far as our crystal ball can see, farther from implementation in the Canadian Atlantic.

[2] "The State of World Fisheries and Aquaculture: Opportunities and Challenges", *Food and Agriculture Organization of the United Nations* (2014) at 4, online: <www.fao.org/3/a-i3720e.pdf>.

[3] "The State of World Fisheries and Aquaculture: Opportunities and Challenges", *Food and Agriculture Organization of the United Nations* (2014) at 10, online: <http://www.fao.org/3/a-i5555e.pdf>.

[4] *Ibid*, at 18, 22, 76.

("**MW**") of energy, of which up to 2,400 MW – more than double the amount of energy used to power all Nova Scotia's homes – may be extracted without significant impact on the marine environment.[5] While second generation trials are underway now, extensive research is still required to develop economically viable technology to harness the tides and mitigate any potential adverse environmental impact.

We are only beginning to envision how new technologies, autonomous vessels, remote sensing and remote data uses, and other innovations will create and support future uses of the oceans. With its history of dependence on the ocean for its economic prosperity, Atlantic Canada is well-positioned to take advantage of these emerging opportunities. But to do so, robust and comprehensive regulatory regimes for ocean resources – such as those we propose – are required.

[5] *We Choose Now: A Playbook for Nova Scotians* (One Nova Scotia Coalition, 2015) at 72, online: <https://static1.squarespace.com/static/560e8359e4b015462b7d4b37/t/5638d589e4b0ce96e22646ad/1446565257252/15-43356+We+Choose+Now+FOR+WEB+Nov+2.pdf>.

ACKNOWLEDGMENTS

Two McInnes Cooper Ocean Economy lawyers led the writing of this proposal:

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The following McInnes Cooper Ocean Economy lawyers, in particular, contributed thoughtful input and expertise:

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McInnes Cooper acknowledges and extends special thanks to **Nigel Bankes** and **Dr. Marlon Lewis** for taking the time in June 2017 to review and provide their comments on a late draft of this proposal. Of course, the views expressed and any errors or omissions are the authors' own.

The **Canadian Institute of Resources Law** was incorporated in 1979 as a registered charity with a mandate to examine the legal aspects of both renewable and non-renewable resources. Its work falls into three interrelated areas: research, education, and publication. The Institute has engaged in a wide variety of research projects, including studies on oil and gas, mining, forestry, water, electricity, the environment, aboriginal rights, surface rights, and the trade of Canada's natural resources. The education function of the Institute is pursued by sponsoring conferences and short courses on particular topical aspects of resources law, and through teaching in the Faculty of Law at the University of Calgary. The major publication of the Institute is its ongoing looseleaf service, the Canada Energy Law Service, published in association with Carswell/Thomson Reuters. The results of other Institute research are published as Occasional Papers. The Institute is supported by the Alberta Law Foundation, the Government of Canada, and the private sector. The members of the Board of Directors are appointed by the Faculty of Law at the University of Calgary and the President of the University of Calgary.

PART 1 THE OPPORTUNITY AND THE REALITY

The opportunities offered by Atlantic Canada's proximity to the ocean are great. To date, however, Atlantic Canada has not taken complete advantage of its ocean resources. The current regulation of ocean resource activities in Atlantic Canada is a key barrier to realizing the region's full potential.

The Opportunity for Atlantic Canada

Emerging Ocean Resource Activities

Atlantic Canada's geography, geology and wealth of maritime expertise, and the ocean-based resources off its coasts, both traditional and emerging, afford the region significant scientific research and commercial opportunities.

The continental shelf off the coasts of Nova Scotia and Newfoundland and Labrador is enormous. The area within the 200 nautical mile ("**NM**") limit is 1.2 million square kilometres[6] - about the size of Alberta and Saskatchewan combined - and the extended shelf may be nearly that size again. Its sediment wedge is thick[7], holding unusual promise for hydrocarbon and mineral development.

The waters above the shelf harbour some of the most significant fisheries in the world. They include the Grand Banks and Georges Bank areas of the Northwest Atlantic where the convergence of the Gulf Stream and the Labrador Current enhances fish resource productivity.[8] In 2015, the value of Nova Scotia's and Newfoundland and Labrador's landings exceeded $2 billion (N.S.: $1.2 billion; N.L.: $860 million).[9]

Aquaculture value, by comparison, is small. In 2015, Nova Scotia's and Newfoundland and Labrador's aquaculture industries produced about $215 million (N.S.: $56 million; N.L.: $161 million).[10] All of this aquaculture value was produced in the near-shore. The aquaculture industry beyond inland waters is *mare incognitum* (uncharted or unknown seas) for Atlantic Canada; its potential is immense.

The Northwest Atlantic has provided critical protein to the dense populations of the eastern United States, Europe, South America and beyond for centuries. As the population of *homo sapiens* approaches the 9 billion mark in 20 years,[11] we will have to develop new, efficient and huge sources of food to sustain these unprecedented numbers. If developed thoughtfully and sustainably, ocean aquaculture will be a major source of that nutrition.

Similarly, the careful harnessing of ocean wind and tide to produce electricity constitutes an opportunity that new technology is beginning to turn into reality. Atlantic Canada's proximity to major markets for power provides a commercial incentive to test and develop "blue" technology both in the generation and the transmission of this power. The particularly awesome and challenging power of the tides in the Bay of

[6] "Backgrounder – Canada's Continental shelf submission", *Global Affairs Canada* (December 9, 2013), online: <http://www.international.gc.ca/media/aff/news-communiques/2013/12/09a_bg1.aspx?lang=eng>.
[7] L.H. King et al, "Geological Development of the Continental Margin of Atlantic Canada" (1975) 2:1 Geoscience Canada at 26.
[8] "Atlantic Groundfish: Underwater World", *Department of Fisheries and Oceans* (Ottawa: Communications Directorate Fisheries and Oceans Canada, 2000) at 2, online: <publications.gc.ca/collections/Collection/Fs41-33-2-2000E.pdf>.
[9] "Seafisheries", *Fisheries and Oceans Canada* (24 January 2017), online: <www.dfo-mpo.gc.ca/stats/commercial/land-debarq/sea-maritimes/s2015av-eng.htm>.
[10] "Aquaculture", *Fisheries and Oceans Canada* (24 January 2017), online: <www.dfo-mpo.gc.ca/stats/aqua/aqua15-eng.htm>.
[11] United Nations Department of Economic and Social Affairs, 2015 – The current world population of 7.3 billion is expected to reach 8.5 billion by 2030, 9.7 billion in 2050 and 11.2 billion in 2100, according to a new UN DESA report. See: "World Population Prospects: The 2015 Revision", *United Nations Department of Economic and Social Affairs* (New York: July 29, 2015), online: <www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html>.

Fundy has created a near-shore blue-technology innovation niche that is progressing rapidly toward commercial generation. Future open-ocean tidal and wind farms may be able to adapt some of that technology to environmental parallels in Canada's exclusive economic zone ("**EEZ**").

The first steps in developing ocean resources were, unsurprisingly, near-shore aquaculture, tidal power and wind farms. But as competition for ocean space and resources increases and new technologies emerge, ocean resource activities are moving further and further from shore. For instance, fish farming in coves and inlets along the coastline is limited by size, by competing commercial, recreational and tourism uses, by pollution concerns, and by claims of Indigenous peoples. The 'Not-In-My-Backyard' syndrome has, appropriately in some cases and not in others, restricted, redirected and delayed the growth of aquaculture in Atlantic Canada.[12] Environmentally responsible and technologically innovative open-ocean aquaculture (sometimes called "offshore aquaculture" or "mariculture")[13] can minimize or eliminate many developmental obstacles that competing uses and sustainability issues in the near-shore cause, but their offshore location introduces additional impediments.

Similarly, open-ocean wind developments offer significant advantages over their onshore cousins. Ocean winds are generally stronger and more consistent than land-based winds, which are disturbed and made less reliable by mountains, valleys, basins, ranges, deserts, and other geographical features of *terra firma*. Turbines and propeller blades designed for the open ocean can be significantly larger and more efficient than their onshore counterparts, and will be located far enough away from homes that alleged human health impacts of wind turbines should not be a concern. Transmission lines can be routed without invading the property rights of hundreds of landowners. And open-ocean tidal developments present their own set of advantages, though the increase in sheer project size, a significant benefit in aquaculture and wind farms, may not measure up against the awesome and perhaps unique power of Bay of Fundy tides.

There are major challenges in developing ocean resources, particularly in open-ocean sites, to be sure. There will still be the challenge of competing human uses with, for example, traditional navigation, fisheries and the laying and maintenance of transmission and communications cables.[14] But this competition will be minor by the standards of onshore or littoral developments.[15] Another challenge is the interdisciplinary engineering and cooperative design expertise that will test the feasibility of multi-use, co-located aquaculture / wind farm / tidal energy developments in the open ocean; there has already been serious focus on wind farms under development in connection with offshore oil and gas platforms.[16] Technological challenges will focus on autonomous operations and data collection. There will be new environmental challenges to consider, as these new technologies will inevitably bring environmental changes, the effects of which will have to be measured and mitigated.

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[12] See e.g. *Specter v Nova Scotia (Minister of Fisheries & Aquaculture)*, 2012 NSSC 40, 312 NSR (2d) 346; *St Mary's Bay Coastal Alliance Society v Nova Scotia (Minister of Fisheries and Aquaculture)*, 2013 NSSC 105, 328 NSR (2d) 245; *Brighton v Nova Scotia (Minister of Agriculture & Fisheries)*, 2002 NSSC 160, 206 NSR (2d) 95.

[13] For consistency, we will use the term "open-ocean aquaculture" throughout.

[14] Tidal development in the Bay of Fundy has been the subject of litigation in Nova Scotia. See *Bay of Fundy Inshore Fisherman's Assn v Nova Scotia (Minister of Environment)*, 2016 NSSC 286, 15 Admin LR (6th) 125; *Bay of Fundy Inshore Fisherman's Assn v Nova Scotia (Minister of Environment)*, 2017 NSSC 96, 277 ACWS (3d) 769.

[15] If sought to be developed within the sight lines of shore dwellers, ocean-based wind farms may be expected to generate strong NIMBY opposition especially from powerful and influential owners of coastline properties, including, for instance, President Trump: see Danny Hakim & Eric Lipton, "With a Meeting, Trump Renewed a British Wind Farm Fight", *The New York Times* (21 November 2016), online: <https://www.nytimes.com/2016/11/21/business/with-a-meeting-trump-renewed-a-british-wind-farm-fight.html>. Certainly onshore wind farms have faced opposition in Nova Scotia. By way of example, see the litigation in *Friends of River Road (Re)*, 2013 NSUARB 236, 2013 CarswellNS 904; *Friends of River Road (Re)*, 2016 NSUARB 36, 2016 CarswellNS 258; *Friends of Harmony, Camden, Greenfield and Surrounding Areas (Re)*, 2015 NSUARB 273, 2015 CarswellNS 1068.

[16] BH Buck et al, "Extensive Open Ocean Aquaculture Development within Wind Farms in Germany: The Prospect of Offshore Co-management and Legal Constraints" (2004) 47:3-4 Ocean & Coastal Management 95–122; T Michler-Cieluch et al, "Reflections on Integrating Operation and Maintenance Activities of Offshore Wind Farms and Mariculture" (2009) 52:1 Ocean & Coastal Management 57–68; Wei He et al, "Case Study of Integrating an Offshore Wind Farm with Offshore Oil and Gas Platforms and with an Offshore Electrical Grid" [2013] J Renewable Energy 1, online: <dx.doi.org/10.1155/2013/607165>.

Developing ocean resources in Atlantic Canada faces another major – and often overlooked – challenge (and the primary focus here) from the resource management side: filling the large regulatory gap that now exists. Unfilled, this regulatory gap will severely inhibit the development of ocean resources. Atlantic Canada has expertise as well in the management of offshore resources, primarily through its long history of regulating offshore hydrocarbon exploration, production, and decommissioning. This experience has the potential to anchor sensitive regulation of new ocean resources.

Looking Ahead: Oceans-related Science, Innovation and Emerging Technologies

The sustainable and profitable development of ocean resources will go hand-in-hand with the development of science-based, creative technology. The innovation spin-off is a crucial component of the opportunity for Atlantic Canada.

The global market for oceans-related industries in 2011 had an estimated value of over US$3 trillion annually, double that from just six years before.[17]Research partnerships are incubating innovation initiatives around the globe. Atlantic Canada has a well-focused abundance of these potentially transformative relationships. One new example is the Ocean Frontier Institute, spearheaded nationally by Dalhousie University, Memorial University of Newfoundland and the University of Prince Edward Island, and supported by the federal departments of Fisheries and Oceans ("**DFO**"), Environment and the Canadian Coast Guard, among others. International research partners include the Woods Hole Oceanographic Institution of Massachusetts and research institutes in Germany, Norway, France and Ireland. Its central focus is the "safe and sustainable development of the ocean frontier".[18] Its vision is to "improve prediction and mitigation of major storms, help better manage the ocean's living resources, improve aquaculture's potential to meet global seafood demand, strengthen marine transportation policy and risk reduction and transform how we monitor the ocean with new data capture and IT tools".[19]

Toward the more commercial end of the oceans innovation spectrum are organizations like the Centre for Ocean Ventures and Entrepreneurship ("**COVE**") in Dartmouth, Nova Scotia. COVE provides space and facilities for "local and global ocean technology businesses, start-ups, researchers, and marine-based and service businesses that support the ocean technology sector."[20] Another is OceansAdvance, the St. John's-based ocean technology innovation cluster, the members of which include scientific research institutions, federal and provincial government agencies and over 50 industry participants. Its focus is understanding and promoting sustainable development of particularly the protein and energy resources of the "world's real-time cold ocean laboratory".[21]

Among the oceans-related technologies and innovations that currently hold the most potential for growth and marketability are those related to automation and the collection, transmission and use of marine data. Remote sensing technologies and autonomous vessels are leading areas of growth. A 2015 report noted the following emerging areas of ocean technologies:[22]

> Marine Data Collection – Advances in the collection of marine data will be focused on the collection and dissemination of data. This will include advances in the types of data collected, including using advanced applications of existing

[17] "Defined by the Sea: Nova Scotia's Oceans Technology Sector Present and Future", *Government of Nova Scotia* (March 2011) at 3 ["Defined by the Sea"], online: <www.pro-oceanus.com/wp-content/uploads/2013/01/Defined_by_the_sea-NS_Oceans_Technology_Sector.pdf>.
[18] "Ocean Frontier Institute: Safe and Sustainable Development of the Ocean Frontier", *Dalhousie University*, online: <https://www.dal.ca/research/centres_and_institutes/ofi.html>.
[19] "Ocean Frontier Institute: About OFI", *Dalhousie University*, online: <https://www.dal.ca/research/centres_and_institutes/ofi/about-ofi.html>.
[20] "About", *Centre for Ocean Ventures & Entrepreneurship* (2017), online: <coveocean.com/>.
[21] "About the Cluster", *OceansAdvance*, online: <www.oceansadvance.net/about-cluster>.
[22] "Technology Road Mapping for the Oceans Technology Sector in Nova Scotia", *CFN Consultants (Atlantic) Inc. and Partner International Inc.* (2015) at 29–30, 34–35, 44, online: <0-nsleg-edeposit.gov.ns.ca.legcat.gov.ns.ca/deposit/b10689151.pdf>.

> technologies such as sensors and acoustics to collect and distribute data for safety, security, and exploration purposes. […].
>
> Sensors – In the sensor area, it is anticipated that the main areas of advancement will be to create new, more capable sensors, including chemical, biological, genomic, light penetrating, or hyper spectral colour sensors, as examples. […]
>
> Autonomous Vehicles – Autonomous Vehicles (AV) are emerging as the leading area for future development and innovation as companies are looking for safer, efficient, and more capable ways to collect and disseminate data. Whether these vehicles are operating below the surface, on the surface, or in the air, new technologies are arising all the time. […]
>
> Autonomous Communications – As AVs collect more data from deployed sensors and on board technologies, it is important for this technology to get back to the mother ship or land based data capture site. The development of systems so that the data can be captured on an ongoing basis through AVs and then transmitted back to the user of the data on a real time basis is increasingly important. […]
>
> Big Data – The opportunity for the collection and analysis of big data in the oceans technology sector is a significant one. There is already a huge amount of data collected by sensors, ocean mapping, aquaculture monitoring, and ocean surveying. The future of this area will focus on addressing the questions what can be done with all this data when it is collected?
>
> Automation – Increasingly, companies are focusing on automating processes and activities that once had to be completed by a person, or group of people, as well as the deployment of resources into the environment. In the future, it is anticipated that using AUVs for ocean mapping and monitoring, forward observation, real-time data capture, safety and inspection, will be the norm and the industry is already moving in this direction.

These and other innovations will help support the development of safe, sustainable and profitable ocean resource activities. If they are developed in Atlantic Canada, the provinces will also directly reap the economic and scientific benefits.

Intellectual Property in the Offshore

Legal protection of the intellectual property ("**IP**") rights in these innovations and new technologies – the IP ownership, commercialization, and division of rights among the stakeholders (developers, owners, investors and sponsors) - is even more complex in the EEZ than onshore.

Federal law governs patents, copyrights and trademarks. All federal law applies in the territorial sea, which is part of Canada proper, and all federal laws apply on "marine installations or structures" and "artificial islands" within the EEZ.[23] As it is now, persons in the territorial sea or on marine installations or structures and artificial islands within the EEZ that infringe intellectual property rights existing under Canadian law may be brought to justice in Canadian courts applying Canadian intellectual property law.

[23] *Oceans Act*, SC 1996, c 31, s 20(1).

Our proposal for good governance of ocean-based resources includes the expansion of these definitions[24] to include wind, aquaculture, tidal and other ocean-based resource and research projects so all federal laws will apply in the new regimes as they do now on offshore hydrocarbon projects.

Other kinds of intellectual property rights, such as those protecting confidential information and trade secrets, are governed by provincial law.[25] Provincial law does not generally apply in the territorial sea or the EEZ unless federal law expressly authorizes its application. Our good governance proposal includes making provincial law relating to the protection and preservation of intellectual property rights applicable in the territorial sea and the EEZ.

The Current State of Aquaculture in Atlantic Canada

The current state of aquaculture in Atlantic Canada demonstrates the extent to which the regulation of ocean resource activities is a key barrier to realizing the region's full potential.

Canada's aquaculture industry is relatively small, accounting for only 0.3 percent of global tonnage of product in 2012. Yet Canada occupies a strong niche market in certain species, particularly Atlantic salmon; Canada is the fourth-largest producer of farmed Atlantic salmon in the world, behind Norway, the United Kingdom and Chile.[26] Moreover, the value of Canada's aquaculture production increased by 37 percent over the decade preceding 2015, from $706 million in 2005 to $967 million in 2015.[27] Aquaculture represents about a third of Canada's total fisheries value and about 20 percent of Canada's total seafood production.[28] National aquaculture output is divided almost equally between British Columbia and the Atlantic provinces. In 2015, British Columbia accounted for about 54 percent of total production volume, followed by New Brunswick at 13 percent, Newfoundland and Labrador and Prince Edward Island at 12 percent each, and Nova Scotia at four percent.[29]

All existing aquaculture facilities in Atlantic Canada are sited near-shore, within those internal waters and historic bays that fall within provincial borders.[30] As discussed earlier, the potential for open-ocean aquaculture at sites located away from the littoral is significant. The ever-increasing competition for land and water space, along with the growing market demand for seafood, are motivating the aquaculture engineering industry and entrepreneurs to develop farming structures in open waters. Despite technological innovations and potential environmental, economic and social benefits of moving aquaculture offshore, away from coastal areas, there are currently no facilities in open-ocean sites in Canadian waters. While open-ocean aquaculture has proven technically feasible, its adoption has been slow. This is due in large part to the significant logistical, technical and economic challenges of operating a farm at a site exposed to high-energy winds, waves and currents.

A further and significant challenge in Atlantic Canada, however, is the absence of a stable regulatory framework to support open-ocean aquaculture facilities. While there are undoubtedly economic and

[24] Consideration should also be given to clarifying s. 8(2.1) of the *Interpretation Act*, RSC 1985, c I-21, which deems federal laws that apply to "exploring or exploiting, conserving or managing natural resources" to also apply within the EEZ. Assuming aquaculture and renewable energy sources constitute "natural resources", no clarification should be needed.
[25] David Vaver, *Intellectual Property Law*, 2nd ed (Toronto: Irwin Law, 2011) at pp 41–42.
[26] "Aquaculture in Canada 2012: A Report on Aquaculture Sustainability", *Fisheries and Oceans Canada* (2012) at 7, online: <www.dfo-mpo.gc.ca/aquaculture/lib-bib/asri-irda/pdf/DFO_2012_SRI_AQUACULTURE_ENG.pdf>.
[27] "Aquaculture Production Quantities and Values", *Fisheries and Oceans Canada* (24 January 2017), online: <http://www.dfo-mpo.gc.ca/stats/aqua/aqua-prod-eng.htm>.
[28] "Aquaculture Statistics", *Fisheries and Oceans Canada* (12 January 2013), online: <http://www.dfo-mpo.gc.ca/aquaculture/sector-secteur/stats-eng.htm>.
[29] "Aquaculture Production Quantities and Values (2015)", *Fisheries and Oceans Canada* (24 January 2017), online: <http://www.dfo-mpo.gc.ca/stats/aqua/aqua15-eng.htm>.
[30] See T Nguyen and T Willams, "Aquaculture in Canada", Background Paper, (Ottawa: Library of Parliament, 2013) at Appendix i, online: <https://lop.parl.ca/Content/LOP/ResearchPublications/2013-12-e.pdf>.

logistical reasons for the absence of open-ocean facilities in Canada, we suggest the reasons are also regulatory. For innovative open-ocean aquaculture investors seeking ocean sites to test technologies or methods, or establish productive facilities, a stable regulatory regime is a necessary condition to investment.

Federal and Provincial Regulation of Near-Shore Aquaculture

In Atlantic Canada's internal waters and historic bays, which fall within provincial boundaries, the federal and provincial governments share regulatory authority over aquaculture, from siting, design and operation through to decommissioning.[31] Aquaculture governance in Atlantic Canada is therefore complex, not only because it involves two levels of government in each jurisdiction, but also because it involves several departments and agencies from each level of government. Even the division of roles and responsibilities between the federal government and the provinces varies from one jurisdiction to another as a result of different provisions in the separate Memorandums of Understanding ("**MOUs**") entered into between each of the provinces and the federal government.[32] Similarly, while each province will require some form of lease and licence to participate in aquaculture activities, the applicable terms and conditions and the application requirements differ across each of the four Atlantic provinces.

Federal Government

At the federal level, aquaculture is regulated through seven distinct departments and agencies involving at least twelve different, but interrelated, pieces of legislation and several related regulations.[33] DFO, however, is the federal department primarily responsible for aquaculture regulation. Currently, DFO regulates aquaculture pursuant to the *Aquaculture Activities Regulations*[34] made under the *Fisheries Act*.[35] The *Navigation Protection Act*[36] and the *Canadian Environmental Assessment Act, 2012* ("***CEAA 2012***")[37] also play an important role in federal regulation of aquaculture.

The *Fisheries Act* simply does not contemplate aquaculture in its modern form, except as an impediment to capture fisheries, beyond authorizing the Minister to set apart waters for fish propagation[38] or to grant licences for oyster cultivation.[39] Indeed, the current version of the *Fisheries Act* does not contain a single reference to "aquaculture." The subjects of the *Fisheries Act* provisions under which the *Aquaculture*

[31] The situation on the West Coast is significantly different, however. In *Morton v British Columbia (Agriculture and Lands)*, 2009 BCSC 136, 92 BCLR (4th) 314, the British Columbia Supreme Court ruled that finfish aquaculture constituted "fisheries" and that the regulation thereof was the exclusive jurisdiction of the federal government under s. 91(12) of the *Constitution Act, 1867.* British Columbia's aquaculture legislation was declared *ultra vires* the Province and of no force and effect. Following *Morton*, in 2010, the federal government enacted the *Pacific Aquaculture Regulations*, SOR/2010-270, providing a somewhat comprehensive scheme for the regulation of aquaculture on the West Coast up to the 12 NM limit of the territorial sea. However, the *Pacific Aquaculture Regulations* do not apply beyond the territorial sea, and thus do not extend into Canada's Pacific EEZ: see s. 2.

[32] In 2008, the Atlantic provinces signed the *Atlantic Provinces' Memorandum of Understanding for the Development of the Aquaculture Sector,* committing to work collaboratively for the development of a sustainable aquaculture industry in the region. With respect to governance, the MOU commits the four provincial governments to work towards a harmonized regulatory and policy environment, to the extent possible, in areas such as leasing and licensing, environmental monitoring, introductions and transfers, aquaculture statistics, and aquatic animal health.

[33] For instance, the federal departments and agencies involved include: Environment Canada, responsible for minimizing threats to Canadians and the environment from pollution, including water pollution, under the *Canadian Environmental Protection Act, 2012*, SC 2012, c 19; Health Canada, responsible for ensuring safety of veterinary drugs administered in aquaculture operations, under the *Food and Drugs Act,* RSC 1985, c F-27; the Pest Management Regulatory Agency, responsible for pest control products including those used in aquaculture (to manage sea lice, for example), under the *Pest Control Products Act*, SC 2002, c 28; the Canadian Food Inspection Agency, responsible for, among other things, managing and controlling animal diseases, including diseases affecting aquaculture operations, under the *Health of Animals Act*, SC 1990, c 21; Transport Canada, responsible for aquaculture facilities siting in navigable waters under the *Navigation Protection Act*, RSC 1985, c N-22, and vessel pollution and safety under the *Canada Shipping Act, 2001*, SC 2001, c 26.

[34] *Aquaculture Activities Regulations*, SOR/2015-117.

[35] *Fisheries Act*, RSC 1985, c F-14.

[36] *Navigation Protection Act*, RSC 1985, c N-22.

[37] *Canadian Environmental Assessment Act, 2012*, SC 2012, c 19 ["*CEAA 2012"*].

[38] *Fisheries Act*, *supra* note 35, s 57.

[39] *Ibid*, ss 58–59.

Activities Regulations are made belie the current federal approach to aquaculture:[40] they focus on works, undertakings or activities that result in serious harm to fish and the deposit of substances deleterious to fish. The *Aquaculture Activities Regulations* accordingly do not offer a direct and comprehensive regulatory scheme for the authorization, regulation and support of aquaculture activities within federal jurisdiction; rather, they regulate aquaculture only to the extent that such activity poses a threat to wild capture fisheries. The regulatory conditions that would actually support the aquaculture industry – leasing, licensing and property protection, for instance – are left to the provinces. While the focus on harm to wild capture fisheries is both important and necessary, it should not be the sole regulatory focus.

The fact that several federal departments and agencies are involved in the management of aquaculture reflects the cross-disciplinary nature of the industry. However, this also leads to overlap and duplication in regulations, as well as in monitoring and compliance activities. For many years, the industry has called for a single national aquaculture statute that would reduce duplication, allow consistent oversight and harmonize the federal regulatory instruments.[41] In February 2017, the federal Advisory Council on Economic Growth recommended a "new, forward-looking Canadian Aquaculture Act combined with an economic-development strategy that reforms ill-adapted traditional fisheries regulations for this emerging subsector to create opportunities for provincial, regional, and aboriginal stakeholders".[42] That recommendation has not, as of the date of this proposal, been implemented.

Prince Edward Island

Unlike the other Atlantic provinces, P.E.I. does not have a provincially-based regulatory framework for aquaculture. DFO has primary authority to manage aquaculture in P.E.I. pursuant to a 1928 MOU between the federal and provincial governments that granted the federal government authority to issue leases for the purpose of oyster aquaculture. The MOU, renewed in 1987, identifies DFO as the lead agency for the administration of aquaculture licensing in the province. However, P.E.I. Fisheries, Aquaculture and Rural Development ("**PEI-FARD**") also has certain rights and obligations, some of which are found in the provincial *Fisheries Act*.[43] Aquaculture regulation in P.E.I. is thus a co-management approach that includes DFO's P.E.I. Aquaculture Leasing Division and PEI-FARD's Aquaculture Division. Representatives from the two divisions participate in the Aquaculture Leasing Management Board ("**ALMB**"), which also includes industry members. On the advice of the ALMB, the P.E.I. Aquaculture Leasing Division specifies under what conditions leases may be issued, how and why terms of contracts may be extended and under what conditions leases may be cancelled.

New Brunswick

The New Brunswick Department of Agriculture, Aquaculture and Fisheries ("**NB-DAAF**") and DFO serve as the lead provincial and federal departments in aquaculture regulation in New Brunswick. In 1988, New Brunswick passed the *Aquaculture Act*[44] and, in 1991, adopted the *General Regulation*[45]; these laws govern the aquaculture of finfish, shellfish and aquatic plants in New Brunswick. Under a 1989 MOU with the federal government, the Province has responsibility for the licensing and leasing of aquaculture operations, while both levels of government cooperate in the development of site allocation

[40] *Ibid*, ss 35(3), 36(5.2).
[41] See e.g. "A New Aquaculture Act in Canada", *The Canadian Aquaculture Industry Alliance*, online: <https://www.aquaculture.ca/a-new-aquaculture-act-in-canada-index>.
[42] "Unleashing the Growth Potential of Key Sectors", *Advisory Council on Economic Growth* (February 6, 2017) at 12, online: <www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>.
[43] *Fisheries Act*, RSPEI 1988, c F-13.01.
[44] *Aquaculture Act*, SNB 1988, c A-9.2, since repealed and replaced by the *Aquaculture Act*, RSNB 2011, c 112.
[45] *General Regulation*, NB Reg 91-158.

criteria.[46] Other departments and agencies are also involved in the support, development and regulation of the aquaculture industry.[47]

Nova Scotia

The *Fisheries and Coastal Resources Act*[48] and its *Aquaculture Licence and Lease Regulations*[49] are the primary laws governing aquaculture in Nova Scotia. An MOU on aquaculture between the federal government and Nova Scotia establishes the roles and responsibilities of each level of government, as represented by the provincial Department of Fisheries and Aquaculture and DFO.[50] Under this MOU, Nova Scotia is the lead on licensing and leasing, site inspections and compliance, and fish health management. Both levels of government share in the responsibility for environmental management and monitoring.

Newfoundland and Labrador

Newfoundland and Labrador first became involved in aquaculture in 1988 with the signing of an MOU between the Province and the federal government and the introduction of the *Aquaculture Act*[51] and *Aquaculture Regulations*.[52] The MOU outlines the roles and responsibilities of each level of government. The provincial Department of Fisheries and Aquaculture is responsible for aquaculture licensing, inspections, enforcement and development and extension services; DFO is responsible for habitat protection. Shared responsibilities include environmental protection, aquaculture science, site inspection and fish health.

Regulation of Open-Ocean Aquaculture

The provinces have no jurisdiction outside their borders (as explained further in Part 3 International and Domestic Framework). Thus, the provincial regimes outlined earlier apply only in waters within provincial territory; generally, these are limited to sheltered inland waters, such as bays, coves and harbours. The jurisdiction to regulate open-ocean aquaculture beyond provincial territory falls exclusively to the federal government. There is no comprehensive federal regulatory scheme to support open-ocean aquaculture industry, however. While the federal *Aquaculture Activities Regulations* technically apply outside provincial waters, they are not designed to act as standalone regulations and lack the additional regulatory detail that provincial laws provide in near-shore waters. The federal regulations only refer tangentially to open-ocean aquaculture activity.[53] Indeed, DFO's background to the *Aquaculture Activities Regulations* seems to suggest that aquaculture would never take place beyond provincial borders, describing the federal responsibility as follows:[54]

[46] Government of Canada & Province of New Brunswick, *Canada-New Brunswick Memorandum of Understanding on Aquaculture Development* (1989).
[47] In particular, the New Brunswick Department of Environment and Local Government plays an important role in the environmental management of the industry.
[48] *Fisheries and Coastal Resources Act*, SNS 1996, c 25.
[49] *Aquaculture Licence and Lease Regulations*, NS Reg 347/2015.
[50] Government of Canada & Province of Nova Scotia, *Canada-Nova Scotia Memorandum of Understanding on Aquaculture Development* (2002).
[51] *Aquaculture Act*, RSNL 1990, c A-13.
[52] *Aquaculture Regulations*, CNLR 1139/96.
[53] For example, subsection 5(a) provides that in the case of aquaculture activity involving the deposit of a prescription drug, the drug must be prescribed by a veterinarian authorized under the laws of the province in which the aquaculture facility is located or under the laws of any province "if the aquaculture facility is not located in a province", which is to say outside provincial waters. See *Aquaculture Activities Regulations*, *supra* note 34, s 5(a).
[54] "Aquaculture Activities Regulations Guidance Document", *Fisheries and Oceans Canada* (2 March 2017), online: <www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-gd-eng.htm#background>.

> Provincial governments are the primary regulators and leasing authorities for aquaculture (except in British Columbia and Prince Edward Island), while the federal government has responsibility for navigation, disease prevention affecting international trade, and the environment under the *Fisheries Act* and the *Health of Animals Act*.

That there are no open-ocean aquaculture sites in Canada is in part attributable to the nascent state of the industry. But it is telling that DFO's background document appears to leave no room for the development of a federal open-ocean aquaculture regime in Canada. The absence of a federal regulatory regime to support such activities will prevent the industry from ever taking root in Canada. Our proposed regulatory regime would remedy this situation.

The Current State of Ocean-based Renewable Energy in Atlantic Canada

Offshore Wind

There are no offshore wind projects in Atlantic Canada. While Newfoundland and Labrador-based Beothuk Energy Inc. has announced its intention to pursue certain offshore wind projects in the region,[55] there is in Atlantic Canada simply no regulatory regime that would make applying for and obtaining authorization for such projects outside of provincial territory feasible.

Tidal Regulation: Nova Scotia's Tidal Regulatory Regime

Nova Scotia's *Renewable Electricity Regulations*[56] provide that renewable low-impact electricity may be produced in the province from a number of sources, including ocean-powered energy, tidal energy, wave energy and wind energy.[57] The regulatory framework for marine renewable energy in Nova Scotia to date has focused on tidal in the Bay of Fundy. This framework has enabled "Canada's leading test center for in-stream tidal energy technology", the Fundy Ocean Research Center for Energy ("**FORCE**") in the Minas Passage.[58] Located between Nova Scotia and New Brunswick, the "Bay of Fundy has more than 160 billion tonnes of water flow with each tide, delivering a commercial potential of approximately 2,400 megawatts of power".[59] The renewable energy potential of the area is unparalleled, and tidal technology that is proven in the Bay of Fundy will be known as having met the "Fundy Standard".[60]
Other than in Nova Scotia, there are no tidal energy projects currently in place in Atlantic Canada. Yet the current regulatory regime that applies to tidal developments in Nova Scotia is complicated.[61] The Nova

[55] James Risdon, "Beothuk Signs Deal with Copenhagen Infrastructure to Develop Wind Farm in Newfoundland", *The Chronicle Herald* (28 September 2016), online: <thechronicleherald.ca/business/1400981-beothuk-signs-deal-with-copenhagen-infrastructure-to-develop-wind-farm-in-newfoundl>. See Beothuk Energy Inc. CEO Kirby Mercer's comments in July, 2017 with respect to its proposed wind project off the western coast of Newfoundland that some sort of commitment is required by the end of 2017 or the project could go elsewhere: Gary Kean, "Beothuk Energy Says it is Ready to Spend $1 Billion to Create New Wind Farm Industry", *The Western Star* (20 July 2017), online: <www.thewesternstar.com/news/local/2017/7/20/beothuk-energy-says-it-is-ready-to-spend--1-billion-to-create-ne.html>.
[56] *Renewable Electricity Regulations*, NS Reg 155/2010 made under the *Electricity Act*, SNS 2004, c 25.
[57] *Ibid*, ss 3(1), 4–6A.
[58] "FORCE", *FORCE*, online: <fundyforce.ca/about/>.
[59] "Nova Scotia Marine Renewable Energy Strategy", *Province of Nova Scotia* (2012) at 2, online: <https://energy.novascotia.ca/sites/default/files/Nova-Scotia-Marine-Renewable-Energy-Strategy-May-2012.pdf>.
[60] "The Fundy Standard", *FORCE*, online: <fundyforce.ca/renewable-and-predictable/the-fundy-standard/>.
[61] See e.g. "The Offshore Renewable Energy Generation Regulatory Flow-Chart for Industry Initiated Test and Commercial Sites", *Nova Scotia Energy, Province of Nova Scotia*, online: <https://energy.novascotia.ca/sites/default/files/Tidal-Policy-Framework-Nova-Scotia.pdf>; in addition to the legislation discussed in this section, other federal legislation that can be relevant to tidal developments include the *Oceans Act, Migratory Birds Convention Act, Canada Shipping Act, 2001, Canadian Environmental Protection Act, 1999, Canada Labour Code, Canada National Marine Conservation Areas Act, National Energy Board Act*; other provincial legislation that can be relevant include the *Assessment Act, Crown Lands Act, Beaches Act, Special Places Protection Act, Endangered Species Act, Fisheries and Coastal Resources Act, Municipal Government Act, Parks Act, Provincial Parks Act, Wilderness Areas Protection Act, Occupational Health and Safety Act, Public Utilities Act*.

Scotia experience to date demonstrates the go-forward need for a comprehensive, coordinated regulatory regime for the development of ocean-based renewable energy off Atlantic Canada's coasts.

Both federal and provincial governments have jurisdiction to regulate aspects of tidal developments within the Bay of Fundy. This is because the boundary between Nova Scotia and New Brunswick is the middle of the Bay of Fundy, thus extending these provinces' territory and jurisdiction into the Bay.[62] As a result, Nova Scotia is able to regulate renewable energy in the Bay of Fundy as if it were a terrestrial site.[63]

A key feature of Nova Scotia's current tidal regulatory regime is the One-Window Standing Committee, comprising federal and provincial regulators including Natural Resources Canada, Environment Canada, Fisheries and Oceans Canada, Canadian Environmental Assessment Agency, Transport Canada, N.S. Environment, N.S. Labour, N.S. Energy, N.S. Fisheries and Aquaculture, and the N.S. Department of Natural Resources.[64] While the Committee provides proponents access to member departments to discuss and review a proposed project, the proponent still must submit an application for any permits or approvals to each regulator and to any other regulators that may be required.[65]

The Nova Scotia *Environment Act* and *Environmental Assessment Regulations* apply to certain tidal power generating facilities.[66] The federal *CEAA 2012* can also apply to certain in-stream tidal power generating facilities.[67] Where a project falls under both Acts, a joint Environmental Assessment process is available. The Fundy Tidal Energy Demonstration Project undertaking that FORCE proposed in the Minas Passage was approved following a joint federal-provincial environmental assessment process in 2009.[68]

Authorizations can be required under the federal *Fisheries Act* where the activity will result in serious harm either to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.[69] The federal *Navigation Protection Act* prohibits any work from being placed in, on, over, under, through or across any navigable water[70] without notice to the Minister.[71] Where the work will likely substantially interfere with navigation, an approval of the work must be obtained from the Minister of Transport.[72] If there are any species listed as endangered, threatened or extirpated under the *Species at*

[62] See discussion of federal/provincial jurisdiction in Meinhard Doelle et al, *The Regulation of Tidal Energy Development Off Nova Scotia: Navigating Foggy Waters*, (2006) 55 UNBLJ 27 at 34–41.
[63] Nova Scotia appears to have asserted additional jurisdiction when it comes to achieving its renewable electricity goals. Section 3(1) of the *Renewable Electricity Regulations*, *supra* note 56, defines "province" for the purpose of those Regulations and the *Electricity Act* - in particular, for qualifying as a generator for a developmental tidal array tariff - as including "the lands and submarine areas within the limits of the offshore area described in Schedule I to the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act* as amended by the Schedule I *(Offshore Area Limits) Amending Regulations* made under that Act".
[64] "Guidelines for Permitting of a Pre-Commercial Demonstration Phase for Offshore Renewable Energy Devices (Marine Renewables) in Nova Scotia", *Nova Scotia Energy, Province of Nova Scotia* (August 2012) at 4, online: <https://energy.novascotia.ca/sites/default/files/Final-Guidelines-for-Permitting-Demonstration-Phase.pdf>.
[65] *Ibid*.
[66] An energy generating facility that has a production rating of at least 2 MW derived from wind, tides or waves is a Class I Undertaking requiring an environmental assessment approval: *Environmental Assessment Regulations*, NS Reg 26/95 made under the *Environment Act*, SNS 1994-95, c 1.
[67] The construction, operation, decommissioning and abandonment of a new in-stream tidal power generating facility with a production capacity of 50 MW and the expansion of an existing in-stream tidal power generating facility that would result in an increase in production capacity of 50% or more and a total production capacity of 50 MW or more are designated projects under CEAA, 2012: *Regulations Designating Physical Activities*, SOR/2012-147 made under *CEAA, 2012*, *supra* note 37, s 52.
[68] "Fundy Tidal Energy Strategic Environmental Assessment Final Report", *OEER Association for the Nova Scotia Department of Energy* (April 2008), online: <http://www.oera.ca/wp-content/uploads/2013/06/FINAL-SEA-REPORT.pdf>.
[69] *Fisheries Act*, *supra* note 35, s 35.
[70] Navigable water in Atlantic Canada includes all waters from the outer limit of the 12 nautical mile territorial sea up to the high water mark: Schedule to the *Navigation Protection Act*, *supra* note 36.
[71] *Navigation Protection Act*, *supra* note 36, ss 3, 5.
[72] *Ibid*, s 6.

Risk Act that may be affected by the activity, a permit or exemption authorizing the activity may be sought.[73]

Projects connected to Nova Scotia Power Inc.'s ("**NSPI**") electricity grid need a Developmental Tidal Feed-In Tariff. This Tariff was established under Nova Scotia's *Renewable Electricity Regulations* to incent the development of a tidal industry in the province, and guarantees a price for the electricity generated from in-stream tidal single device projects or arrays greater than 0.5 MW.[74] Such projects will be subject to a number of interconnection requirements, including obtaining a compliance letter from the Minister of Energy, executing a participation agreement under the *Wholesale Electricity Market Rules*[75] and entering into Power Purchase and Generator Interconnection Agreements with NSPI.

[73] *Species at Risk Act*, SC 2002, c 29, ss 73, 83.
[74] *Renewable Electricity Regulations*, *supra* note 56, ss 3(1), 22.
[75] *Wholesale Market Rules Regulations*, NS Reg 36/2007 made under the *Electricity Act*, SNS 2004, c 25.

PART 2 OCEAN RESOURCE ACTIVITIES IN OTHER JURISDICTIONS

It is clear from a review of the developments in both aquaculture and wind in other countries that there is a huge potential for Atlantic Canada. Both in the case of aquaculture and, in particular, offshore wind, the trend is towards moving the industry farther offshore. Currently, however, this is practically impossible in Canada because there are no comprehensive regulatory regimes to support these ocean resource activities.

Offshore Wind

Denmark

The Danish Energy Agency is the one-window government body responsible for the approval and licensing of offshore renewable energy projects in Denmark. Chapter 3 of the *Promotion of Renewable Energy Act* gives Denmark's federal government the right to exploit energy from water and wind within the territorial waters and EEZ surrounding Denmark up to 200 NM.[76]

Denmark is the world's second largest developer of offshore wind farms, trailing only the United Kingdom. In 2013, it had almost 1300 MW of offshore wind turbines connected to the electricity grid, with the goal of increasing wind production to meet 50% of Denmark's domestic electricity supply by 2020.[77] Denmark currently has 81 fully commissioned offshore wind developments.

Windfarm developments in Denmark have progressively moved further offshore (see Figure 1). There is also an observable trend between the size and capacity of a wind farm development and its location (see Figure 2): larger wind farms tend to be located at greater distances from shore. This may reflect the high costs associated with deep water offshore development, where smaller projects are not economically feasible. Larger developments are able to bear the costs associated with construction and exploit the higher wind capacity in these remote locations.

[76] "Procedures and Permits for Offshore Wind Parks", *Danish Energy Agency*, online: <https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits>.
[77] "Danish Experiences from Offshore Wind Development", *Danish Energy Agency* (May 2015) at 8, 24, online: <https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore_wind_development.pdf>.

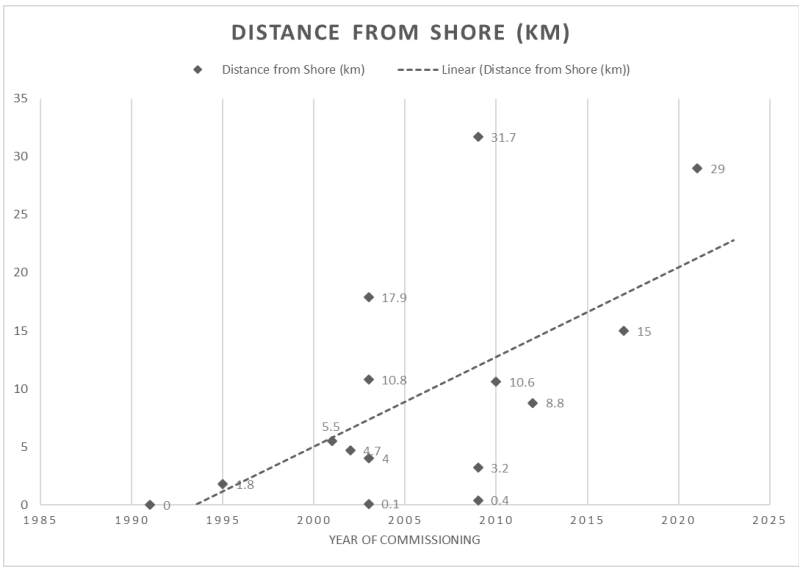

Figure 1 Danish Offshore Wind Farm Trend Line: Distance over time

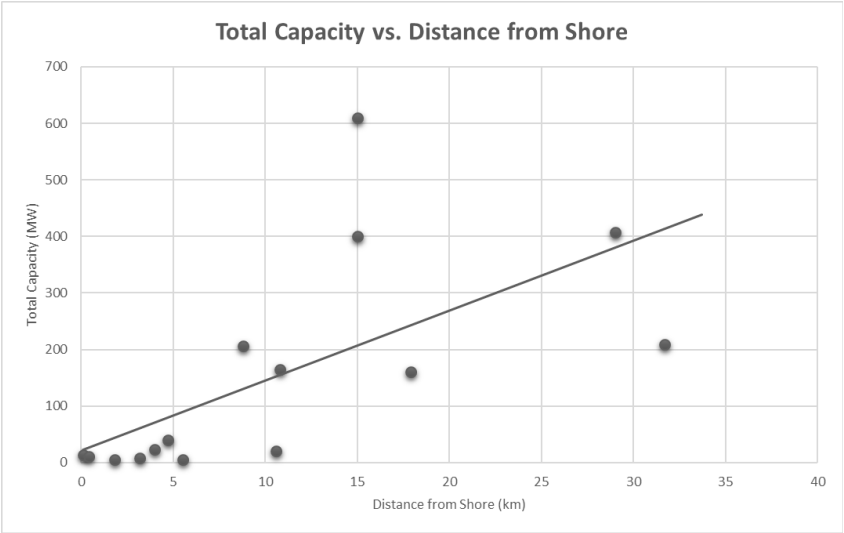

Figure 2 Danish Offshore Wind Farm Trend Line: Capacity and distance

United Kingdom

The U.K. has the largest offshore wind capacity in the world, with 30 wind farms and a production capacity of over 5.1 GW. Offshore wind generation represents 5% of the U.K.'s annual electricity supply and is projected to be able to provide 10% of the U.K.'s power by 2020.[78]

The Crown Estate is responsible for offshore leases required for renewable energy developments, including wind farms. However, it does not coordinate the other consents and approvals required to operate a wind farm, which must be in place before it will provide a lease.[79]

Wind energy development takes place in the context of marine spatial planning performed pursuant to the *Marine and Coastal Access Act 2009*.[80] Nonetheless, the authority that approves the project depends on

[78] "Offshore Wind Energy", *The Crown Estate* (2017), online: <https://www.thecrownestate.co.uk/energy-minerals-and-infrastructure/offshore-wind-energy/>.
[79] "Statutory Consents", *The Crown Estate* (2017), online: <https://www.thecrownestate.co.uk/energy-minerals-and-infrastructure/offshore-wind-energy/working-with-us/>.

the jurisdiction and the size of the proposed development. In England, renewable energy projects up to 100 MW are approved by the Marine Management Organization. In Wales, such projects are approved by Natural Resources Wales; approvals for projects larger than 100 MW are provided by the Planning Inspectorate and the Secretary of State for Energy and Climate Change.[81] In Northern Ireland, the Department of Environment has oversight regarding offshore renewable energy development. Scotland has jurisdiction over renewable energy activities taking place within 12 NM of the coastline, pursuant to the *Marine (Scotland) Act 2010*. While the U.K. has formal jurisdiction beyond 12 NM, it has delegated its regulatory authority to Scotland pursuant to the *UK Marine and Coastal Access Act 2009*.[82] The Marine Scotland Licensing Operations Team offers one-window service to developers, and is the body responsible for issuing the marine licences that are required for project development.[83]

Prior to 2007, the U.K.'s offshore wind farms were located relatively close to shore, in water less than 20 m in depth. Technology advancements gave companies the ability to develop the capacity for deep-water installation and thus to erect turbines further from the shore. As a result, the majority of approved and operational offshore wind farm projects are located at water depths of between 20 and 40 m and at distances of 20 to 40 km from shore.[84]

Germany

Germany has significant offshore wind capacity development and continues to approve more offshore wind farms in both the North and Baltic Seas. The trend in German wind farm distances: to move further offshore (see Figure 3).[85]

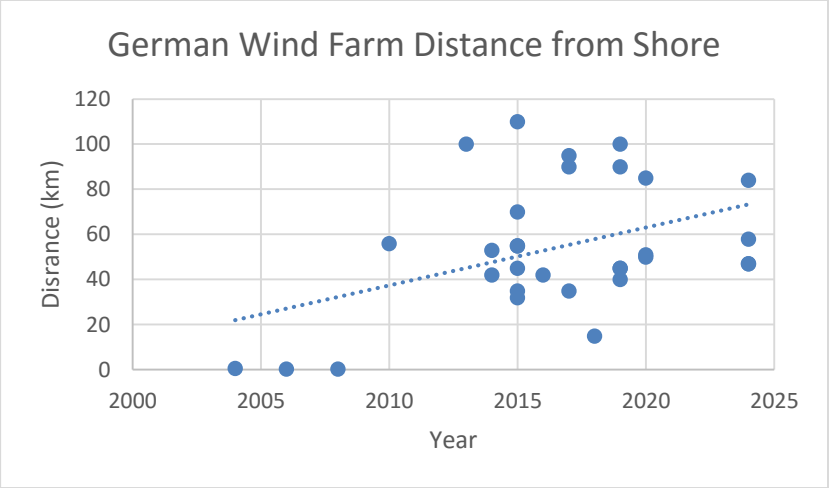

Figure 3 German Offshore Wind Farm Trend Line: Distance over time

Germany is a federal republic with a significant division of powers between the federal and state governments. Under the German constitution, the *Basic Law for the Federal Republic of Germany*, the German federal government has relatively few exclusive powers compared to the Canadian federal

[80] *Marine and Coastal Access Act 2009* (UK), c 23, online: <www.legislation.gov.uk/ukpga/2009/23/contents>; see also "Marine Planning in England", *Marine Management Organisation* (11 June 2014), online: <https://www.gov.uk/government/collections/marine-planning-in-england>.
[81] "The Crown Estate's Role in the Development of Offshore Renewable Energy", *The Crown Estate* (January 2016) at 2, online: <https://www.thecrownestate.co.uk/media/5411/ei-the-crown-estate-role-in-offshore-renewable-energy.pdf>.
[82] "Marine Scotland Licensing and Consents Manual: Covering Marine Renewables and Offshore Wind Energy Development", *The Scottish Government* (Southampton: ABP Marine Environmental Research Ltd, 2012) at 2.1, online: <www.gov.scot/resource/0040/00405806.pdf>.
[83] *Ibid* at 3.1.1.
[84] P Higgins & Aoife M Foley, "The Evolution of Offshore Wind Power in the United Kingdom" (2014) 37 Renewable & Sustainable Energy Rev 599 at 601.
[85] All data on these wind farms has been gathered from 4C Offshore's database of German windfarms. "Offshore Wind Farms", *4C Offshore Ltd* (2017) ["Offshore Wind Farms"], online: <www.4coffshore.com/windfarms/>.

government, though many concurrent powers with the state governments. Energy regulation[86] and the management of water resources[87] are both concurrent powers under the *Basic Law*. However, the *Basic Law* establishes that states may only pass legislation on matters enumerated under the concurrent powers article where and when federal legislation has not already been passed,[88] though on certain matters, including water resource management (but excluding matters dealing with water resource management materials or facilities), the states may legislate in variance of the federal law.[89] On energy issues, the federal government maintains legislative power in the name of national interest.[90] On January 1, 2017, the federal Parliament's *Offshore Wind Act* came into effect implementing a centralized model for auctioning offshore development rights to proponents combined with provisions for the planning and permitting process for those projects.[91]

Netherlands

The trend in the Netherlands is also to locate wind farms farther and farther from shore (see Figure 4).[92]

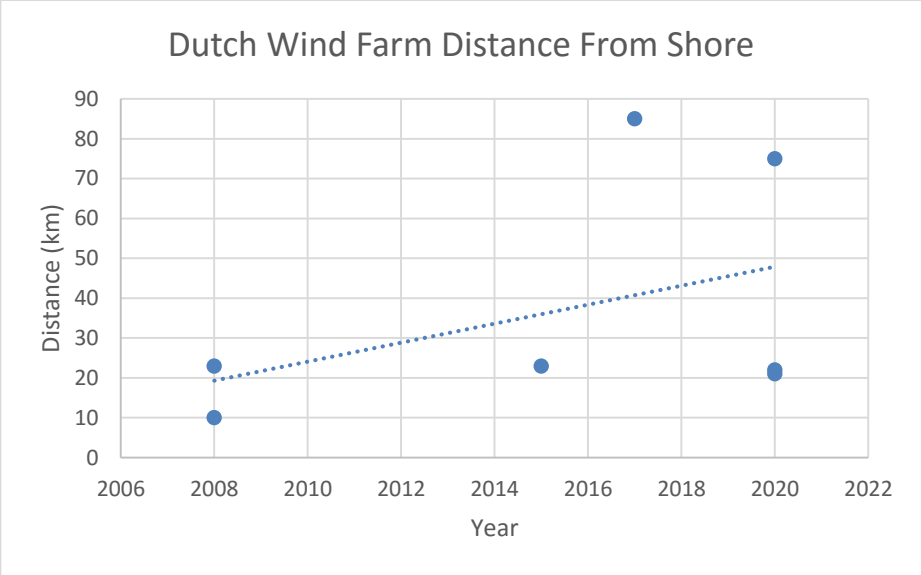

Figure 4 Dutch Offshore Wind Farm Trend Line: Distance over time

The Kingdom of the Netherlands is a unitary state with a high degree of decentralization. Provincial and municipal governments are afforded autonomy for local matters through articles in the Dutch constitution.[93] Matters of national concern, such as economic regulation, energy development and natural resource exploration, are under the purview of the federal government. The Ministry of Economic Affairs is responsible for offshore renewable energy development in the Netherlands, pursuant to the *Offshore Wind Energy Act*.[94] The Netherlands Enterprise Agency receives licence applications for offshore

[86] *Grundgesetz der Bundesrepublik Deutschland (Basic Law for the Federal Republic of Germany),* art 74(1)(11) GG.
[87] *Ibid*, art 74(1)(32).
[88] *Ibid*, art 72(1).
[89] *Ibid*, art 72(3)(5).
[90] *Ibid*, art 72(2).
[91] "The New German Offshore Wind Act*", Watson, Farley, & Williams* (July 2016) at 1, 3, online: www.wfw.com/wp-content/uploads/2016/07/WFW-Briefing-Germany-WindSeeG-2017_EN-July-2016.pdf.
[92] All data on these wind farms has been gathered from 4C Offshore's database of Netherland windfarms: "Offshore Wind Farms", *supra* note 85.
[93] *De Grondwet (Constitution of the Kingdom of Netherlands)*, arts 123, 124(1).
[94] *Wet windenergie op zee (Offshore Wind Energy Act)* (NL), 2015, online: <wetten.overheid.nl/BWBR0036752/2015-07-01>.

renewable energy projects, and has encouraged the development of offshore wind through the designation of five offshore wind farm zones.[95]

The Netherlands has developed significant offshore wind capacity; in May 2017 it opened the world's largest offshore wind farm.[96] The Gemini wind farm has a total capacity of 600 MW and is located 85 km from shore. Dutch wind projects began at smaller scales and closer to shore – and have consistently moved farther from shore over the years (see Figure 4).

United States

Responsibility for regulating offshore renewable energy development in the U.S. is divided between individual states and the federal government. Individual states are responsible, in general, for regulation within three geographic miles of the coastline.[97] The federal government is responsible for regulation beyond three NM. However, coastal states' control over their territorial coastal zones has meant they have a significant degree of control over developments.[98] This shared jurisdiction has been one of the largest barriers to successful offshore wind development in the U.S.[99] There is only one offshore wind project currently operational in the U.S.: the Block Island Offshore Wind Project developed by Deepwater Wind is located three miles off the coast of Block Island, Rhode Island and produces 30 MW of wind generated energy.[100]

Open-Ocean Aquaculture

Other countries have not moved aquaculture development into the open ocean as quickly as they have wind facilities. While the impetus and technology to do so are developing, there are only a few open-ocean aquaculture sites worldwide. A review of some of these open-ocean projects, however, provides a glimpse into the future of aquaculture. In sum, other countries – even those with unwieldy federal structures – are taking steps to develop open-ocean aquaculture industries. The regulatory system we propose would enable Atlantic Canada to ensure it is not left behind as aquaculture moves offshore.

Norway

Norway's *The Aquaculture Act (2005)*[101]governs the management, control and development of aquaculture onshore, in inland waters and, most significantly for present purposes, within Norway's internal waters, territorial sea, EEZ and on the continental shelf. It sets out licensing requirements, permits the registration, transfer and mortgaging of licences, imposes environmental assessment requirements and protections, provides for land tenure, and includes ongoing regulatory control and monitoring. This comprehensive legislation applies to aquaculture of any aquatic organism throughout the product lifecycle. In notable contrast to Canada's federal approach, the purpose of Norway's law is "to promote the profitability and competitiveness of the aquaculture industry within the framework of a sustainable development and contribute to the creation of value on the coast."[102]

[95] "SDE+ Offshore Wind Energy", *Netherlands Enterprise Agency*, online: <english.rvo.nl/subsidies-programmes/sde/sde-offshore-wind-energy>.
[96] "Dutch Open 'World's Largest Offshore' Wind Farm", *Phys.org* (8 May 2017), online: <https://phys.org/news/2017-05-dutch-world-largest-offshore-farm.html>.
[97] 43 USCA § 1301(a)(2) (1953); 43 USCA §1311(a) (1953).
[98] Timothy H Powell, "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project" (2012) 92:2023 BUL Rev 2023 at 2025.
[99] Erica Schroeder, "Turning Offshore Wind On" (2010) 98:5 Cal L Rev 1631 at 1644.
[100] "Block Island Wind Farm: America's First Offshore Wind Farm", *Deepwater Wind* (2017), online: <dwwind.com/project/block-island-wind-farm/>.
[101] *Decree No 1706 of 2005 concerning the Aquaculture Register, 2006* (NO).
[102] "National Aquaculture Legislation Overview: Norway," *FAO Fisheries and Aquaculture Department* (2017), online: <www.fao.org/fishery/legalframework/nalo_norway/en>.

In 2016, the Norwegian Ministry of Trade and Fisheries approved Norway's first development concession enabling Ocean Farming AS, supported by Kongsberg Maritime AS, to build Ocean Farm 1: the world's first automated "exposed" aquaculture facility. The installation is currently under construction in China and is expected to be positioned in Frohavet, off the Trøndelag coast, in the second half of 2017. The innovative new facility is to be comprised of a submerged, anchored fixed structure that will float in the exposed open ocean. The design is touted to be suitable for water depths of 100 to 300 metres, where environmental conditions are optimal for nurturing healthy fish. Being a fully automated facility, normal operation requires a crew of just three to four people and it can also be remotely operated.[103]

Panama

In contrast to Norway's focused approach, Panama regulates aquaculture through a variety of legislative instruments. The Food and Agriculture Organization of the United Nations ("**FAO**") describes the most important of these as:[104]

- Law Decree 35 of 22 September 1966, addressing the use of waters and establishing regulations for the use of Panamanian waters for their exploitation in the public interest.

- Law 58 of 28 December 1995, defining aquaculture as a farming activity and establishing incentives and other applicable regulations. This law promotes the strengthening of aquaculture; through its regulations, incentives are formulated to ensure private investment within the concept of sustainable development.

- Law 41 of 1 July 1998, setting out the principles and basic regulations for the protection, preservation and the recovery of the environment, promoting the sustainable use of natural resources. Article 94 states that coastal marine resources constitute natural patrimony of the state and therefore their exploitation, management, and preservation are regulated by the Maritime Authority of Panama.

- Law Decree 7 of 10 February 1998, creating the Maritime Authority of Panama. Article 4 stipulates measures and their implementation to safeguard national interests in marine spaces and interior waters and to administer marine and coastal resources. It also establishes mechanisms for coordination with the Ministry of Agriculture and Husbandry Development to ensure the development of aquaculture while strictly observing Panama's international commitments.

Panama's waters are the site of an open-ocean aquaculture farm operated by a company called Open Blue. The water depth at the farm ranges from 65 to 70 metres (213 to 230 feet). The facility raises cobia, a species that occurs naturally in the surrounding waters, using low-density, fully submerged pens. The facility is in the Caribbean Sea, some 11 to 12 km (seven miles) off Panama's north coast; the company describes the site as "literally over the horizon."[105] That the facilities will not mar the Caribbean seascape as viewed from Panama's coast is likely to mitigate NIMBYist responses from the tourist industry and seafront landowners.

The United States

The U.S. experience is similar to Canada's in that it is a federal country in which the coastal states and federal government share regulatory jurisdiction over marine aquaculture. Similarly, the states directly

[103] Kongsberg Maritime, Press Release, "World's First 'Offshore' Aquaculture Development Project Receives Green Light from Norwegian Government" (5 April 2016), online: <https://www.km.kongsberg.com/ks/web/nokbg0238.nsf/AllWeb/7C0B0102D79C3321C1257F8C00219350>.
[104] "National Aquaculture Sector Overview: Panama", *FAO Fisheries and Aquaculture Department* (2017), online: <www.fao.org/fishery/countrysector/naso_panama>.
[105] "FAQ", *Open Blue*, online: <www.openblue.com/faq>.

regulate aquaculture leasing and licensing while the federal government regulates indirect aspects, such as trade, commerce and environmental protections. The U.S. differs from Canada in a significant way, however: coastal states' jurisdiction extends three NM offshore.[106] Beyond the state limits lie federal waters, that, like Canada, are under the federal government's sole jurisdiction to the outer limit of a 200 NM EEZ. In some circumstances, proponents can thus obtain state permission to locate facilities in the open ocean up to three NM from shore without the need to rely solely on federal law.

While the U.S. has a dedicated federal aquaculture statute, the *National Aquaculture Act of 1980*,[107] this law does not provide for a comprehensive regulatory scheme for open-ocean aquaculture in federal waters. Instead, it declares a national aquaculture policy, establishes a national aquaculture development plan and coordinates federal activities on aquaculture.[108] The regulation of aquaculture in the U.S. is thus left, as it is in Canada, to a patchwork of oversight by a variety of federal and state organizations, with no comprehensive aquaculture law applicable beyond state jurisdiction.

The FAO describes the U.S. regulatory picture as follows:[109]

> Aquaculture in the [US] is regulated at the federal and state level. The Food and Drug Administration (FDA) of the Department of Health and Human Service (DHHS), the Department of Agriculture (USDA), and the Environmental Protection Agency, are the leading federal agencies that regulate aquaculture within the United States of America. There are other agencies and programs at the federal level involved in aquaculture activities such as the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce, the Joint Subcommittee on Aquaculture, the Center for Veterinary Medicine (FDA), the Animal and Plant Health Inspection Service (USDA), and the U.S. Fish and Wildlife Service (FWS) of the Department of the Interior. The federal government regulates those aquaculture and food-related activities that involve the trade of goods and services between the states, or with foreign countries.
>
> […] The relevant federal statutes rarely address aquaculture directly, and more detailed legislation exists at the state level. For example, the Federal Water Pollution Control Act, the Food, Drug & Cosmetic Act, the Animal Drug Availability Act, and the Magnuson-Stevens Fisheries Conservation Act do not significantly address aquaculture, but provide the statutory framework for regulating food safety, veterinary medicines, HACCP programs, coastal zone management, and other activities related to aquaculture. In many instances, it is the state that monitors and enforces both federal and state aquaculture regulations.

Like Canada, the absence of a comprehensive federal regime for open-ocean aquaculture beyond state jurisdiction has posed an obstacle to the development of an open-ocean industry. A 2007 report by the NOAA concluded:[110]

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[106] Texas and Florida claim jurisdiction up to nine nautical miles. See Michael Rubino, ed, "Offshore Aquaculture in the United States: Economic Considerations, Implications & Opportunities", *US Department of Commerce, National Oceanic & Atmospheric Administration*, NOAA Technical Memorandum NMFS F/SPO-103 (Silver Spring: 2008) at 2–3 ["Rubino"], online: <www.nmfs.noaa.gov/aquaculture/docs/economics_report/econ_report_all.pdf>.
[107] 16 USCA § 2801 (West 1980).
[108] *Ibid*.
[109] "National Aquaculture Legislation Overview: United States of America", *FAO Fisheries and Aquaculture Department*, online: <www.fao.org/fishery/legalframework/nalo_usa/en>.
[110] Rubino, *supra* note 106 at 3.

> For marine aquaculture technology, separation between federal and state waters is not important. The complication arises with how such waters are regulated. Under current U.S. law, aquaculture ventures may obtain a permit to operate in most state waters. The five offshore commercial operations and research projects in the United States – in Hawaii, Puerto Rico, California, and New Hampshire – are in state waters, in locations exposed to open ocean or offshore conditions. But the lack of clear regulatory requirements for aquaculture in federal waters has all but prohibited aquaculture in the U.S. EEZ (Cicin-Sain et. al. 2005). The National Offshore Aquaculture Act of 2007, currently pending before Congress, would clarify federal regulatory requirements, thus allowing businesses and individuals to obtain a permit to operate in federal waters.

The U.S. experience is thus quite similar to that of Canada, and the absence of a federal regime similarly hinders the development of an open-ocean aquaculture industry. However, broader state jurisdiction allows for some open-ocean aquaculture in the right circumstances. NOAA notes that "commercial finfish aquaculture companies in Hawaii are using open ocean aquaculture technologies, including submersible cages, in exposed locations in state waters."[111]

Further, and unlike Canada, U.S. federal agencies have recently taken action to authorize aquaculture in federal waters. On January 13, 2016, the National Marine Fisheries Service ("**NMFS**") issued a final rule establishing:[112]

> a comprehensive regulatory program for managing the development of an environmentally sound and economically sustainable aquaculture fishery in Federal waters of the Gulf of Mexico (Gulf), i.e., the Gulf exclusive economic zone (EEZ). The purpose of this final rule is to increase the yield of Federal fisheries in the Gulf by supplementing the harvest of wild caught species with cultured product.

The rule authorizes the issuance of up to 20 Gulf Aquaculture Permits and sets an annual production limit of 64 million pounds (29 million kilograms) round weight. Interestingly, according to the rule, this maximum level of harvest represents the average landings of all marine species in the Gulf, except menhaden and shrimp, between 2000 and 2006. Individual permit holders will be limited to 20% of the total annual limit.[113] Additionally, NOAA reports that as of 2016, "three shellfish operations received permits for shellfish aquaculture in federal waters off California and Massachusetts, but have not yet begun operations."[114]

[111] "NOAA Fisheries' Final Rule to Implement the Fishery Management Plan for Aquaculture in Federal Waters of the Gulf of Mexico: Frequently Asked Questions", *NOAA Fisheries*, (January 2016) at 2 ["NOAA Fisheries' Final Rule"], online: <sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/aquaculture/documents/pdfs/aquaculture_gulf_fmp_faqs_jan2016.pdf>.
[112] *Fisheries of the Caribbean, Gulf, and South Atlantic; Aquaculture*, 81 Fed Reg 1761 (2016) (to be codified at 50 CFR 600, 50 CFR 622), online: <https://www.federalregister.gov/documents/2016/01/13/2016-00147/fisheries-of-the-caribbean-gulf-and-south-atlantic-aquaculture>.
[113] *Ibid*.
[114] "NOAA Fisheries' Final Rule", *supra* note 111 at 2.

PART 3 INTERNATIONAL & DOMESTIC FRAMEWORK

Any regulatory regime for ocean resource activities in Canada will depend on and be constrained by international law and Canada's constitutional structure. To be effective, the design of the proposed regulatory regimes for ocean resource activities must take into account the parameters of Canada's rights and obligations as a coastal state at international law, and its domestic constitutional legal framework. The most significant consequences of these parameters for present purposes are twofold: first, any proposed system must be grounded in federal law; and second, the provinces have no power to go it alone, despite good policy reasons for a significant provincial role in the creation and operation of such system.

The International Rules: UNCLOS

To properly understand the potential development of an offshore resources industry in Atlantic Canada, it is necessary to describe both the effect of the Law of the Sea Treaty ("**UNCLOS**")[115] and its impact on Canada's ability to legislate in respect of activities in its EEZ and territorial sea.

Maritime Zones and Coastal States' Rights

UNCLOS defines the oceans by reference to its water columns and the ocean floor, or seabed (see Figure 5). In both cases, UNCLOS accords rights to the coastal state, which decrease as the relevant zone is farther offshore. In delineating coastal state rights, UNCLOS attempts to balance the interests of the coastal state with those of others utilizing the same zone.

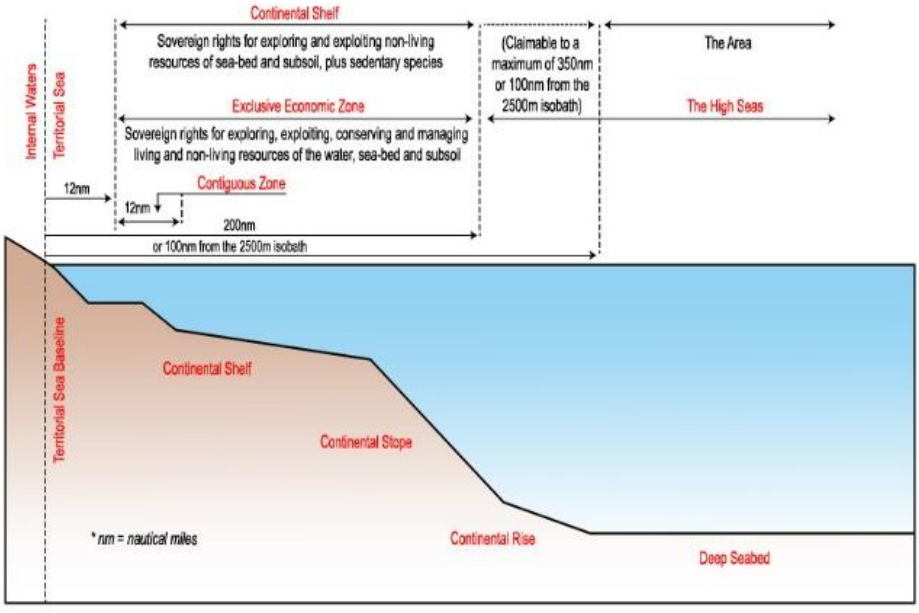

Figure 5 Maritime sovereign rights, by zones, under the Law of the Sea Treaty. Produced by Fisheries and Oceans Canada. This is a copy of an official work published by the Government of Canada and has not been produced in affiliation with, or with the endorsement of the Government of Canada. Reproduced by permission at http://canada.pch.gc.ca/eng/1454685607328.

[115] *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994; ratified by Canada 7 November 2003) ["*UNCLOS*"].

Inland waters and historic bays have been treated as part of the territory of the coastal state for centuries.

- The territorial sea of a coastal state extends up to 12 NM from the coastline, internal waters and historic bays. The coastal state has sovereignty in the territorial sea because it is considered part of the coastal state. UNCLOS provides that ships of all States enjoy the right of innocent passage through the territorial sea, the only qualification to the coastal state's complete sovereignty in that zone.

- In the EEZ (200 NM from the coast), the coastal state has limited sovereign rights that include:[116]

> sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds;

The coastal state also has jurisdiction in the EEZ to establish and use "artificial islands, installations and structures".[117] In the EEZ, UNCLOS requires the coastal state to have "due regard to the rights and duties of other States and shall act in a manner compatible with the provisions of this Convention."[118]

- The water column beyond the EEZ is the high seas.[119] In this zone, the coastal state has no specified rights and UNCLOS states the high seas rights of all states include freedom of navigation, to construct artificial islands and other installations and of fishing. UNCLOS requires these freedoms be exercised "with due regard for the interests of other states in their exercise of the freedom of the high seas".[120]

- Insofar as the seabed is concerned, UNCLOS divides it into the continental shelf and the Area. It defines the continental shelf to comprise "the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin."[121] The coastal state is given limited sovereign rights in respect of the continental shelf limited to "exploring it and exploiting its natural resources".[122] UNCLOS balances coastal state rights in the continental shelf by requiring that the exercise of any rights of the coastal state over the continental shelf "must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States"[123]. The Area is the "seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction"[124], that is, beyond the continental shelf. The Area's resources are the "common heritage of mankind"[125]; activities in the Area must be carried out for the benefit of mankind and taking into particular consideration the interests and needs of developing states.

Overall, what UNCLOS contemplates is a decreasing role for the coastal state as the zones move further away from the coast, until finally reaching the area of the high seas.

[116] *UNCLOS*, *supra* note 115, art 56.1(a); *Oceans Act*, *supra* note 23, s 14.
[117] *UNCLOS*, *supra* note 115, art 56.1(b)(i); *Oceans Act*, *supra* note 23, s 14(b)(i).
[118] *UNCLOS*, *supra* note 115, art 56.2.
[119] *Ibid*, art 86.
[120] *Ibid*, art 87.2.
[121] *UNCLOS*, *supra* note 115, art 76; see also *Oceans Act*, *supra* note 23, s 17(a).
[122] *UNCLOS*, *supra* note 115, art 77.1; see also *Oceans Act*, *supra* note 23, s 18.
[123] *Ibid*, art 78.2.
[124] *UNCLOS*, *supra* note 115, art 1.1(1).
[125] *Ibid*, arts 136, 137.2, 140.1.

Canada has adopted the UNCLOS provisions respecting the territorial sea, EEZ, and the continental shelf in the *Oceans Act*. Since the coastal state has no rights in respect of the high seas, there is no corresponding reference to the high seas in the *Oceans Act*.

UNCLOS's reference to the rights of a "coastal state" means that the coastal state is Canada, and not any provincial or any subnational jurisdiction of Canada, such as Nova Scotia, New Brunswick, Prince Edward Island or Newfoundland and Labrador. This can be seen in section 14 of the *Oceans Act*, which refers to the rights in the EEZ as being those of Canada, and in section 18 in respect of the continental shelf, which provides that the rights belong to Canada. The Supreme Court of Canada has confirmed this conclusion in *Reference re Newfoundland Continental Shelf*.[126]

Oil & Gas

Canada has long exercised legislative rights over the continental shelf on the east coast well beyond 200 NM.[127] While the producing oil fields off the east coast are all within 200 NM,[128] there have been significant discovery licences issued with respect to areas beyond 200 NM.[129] Canada has a fulsome regulatory oil and gas regime administered by the Canada-Newfoundland & Labrador Offshore Petroleum Board ("**CNLOPB**") and the Canada-Nova Scotia Offshore Petroleum Board ("**CNSOPB**"), the jurisdictions of which extend throughout the continental shelf to the outer edge of the continental margin.[130] This regime is well-established and has supported the East Coast oil and gas business for many years.

UNCLOS and the *Oceans Act*, however, are far less clear on Canada's right as a coastal state to regulate aquaculture and renewable energy sources, such as wind, beyond the territorial sea.

Figure 6 International rights and obligations and effects on installations by zone.

UNCLOS, Maritime Zones and Installations				
	Territorial Sea	**EEZ**	**Continental Shelf**	**High Seas**
Rights & Obligations	Sovereignty; must allow for right of innocent passage	Sovereign rights to explore/exploit resources; freedom of navigation, overflight, cables & pipelines; any other use compatible with UNCLOS	Sovereign rights to explore/exploit non-living resources of seabed & sub-soil, plus sedentary species	Freedom of the seas; must have due regard for other states' interests
Effects on installations include aquaculture and wind	Must not hinder innocent passage	Safety zones around installations with notice; must not build where interferes with international navigation	Unlikely any effect on installations like wind & aquaculture; incidental impact on seabed & sub-soil	Have due regard for other states' interests

[126] *Reference re Newfoundland Continental Shelf*, [1984] 1 SCR 86, 5 DLR (4th) 385 ["*Hibernia Reference"*].
[127] D.G. Crosby, "Mineral Resource Activities in the Canadian Offshore" (1970) Maritime Sediments 6:1 at 30-36.
[128] See CNLOPB, Canada-Newfoundland & Labrador Offshore License Information, online: <http://www.cnlopb.ca/pdfs/maps/nlol.pdf?lbisphpreq=1>.
[129] Including Statoil Canada Limited (Block 1047) and Exxon Mobil Canada Properties (Block 200). See CNLOPB, Eastern Newfoundland Region: License Information, online: <http://www.cnlopb.ca/pdfs/maps/eastnl.pdf?lbisphpreq=1>.
[130] Pursuant to joint federal/provincial Acts. See *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*, SC 1987, c 3 ["*NL Accord Act"*]; *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*, SC 1988, c 28 ["*NS Accord Act"*].

Offshore Wind Farms

As noted earlier, UNCLOS and the *Oceans Act* provide for coastal state rights in connection with the EEZ, including "the production of energy from the water, currents and winds." Canada has the rights to regulate wind farms in the EEZ and in the territorial sea beyond the low water mark. A wind farm would be considered either an installation or structure. UNCLOS requires that an installation in a territorial sea must not hinder innocent passage, and in the EEZ should not be built where it interferes with international navigation. Further, a wind industry in the EEZ would be subject to the coastal state's obligation to protect and preserve the marine environment.[131] Subject to these qualifications, the right of the coastal state to regulate offshore wind farms is complete. Yet there is currently no regulatory framework in place in Canada that will support a windfarm industry in the territorial sea or the EEZ.

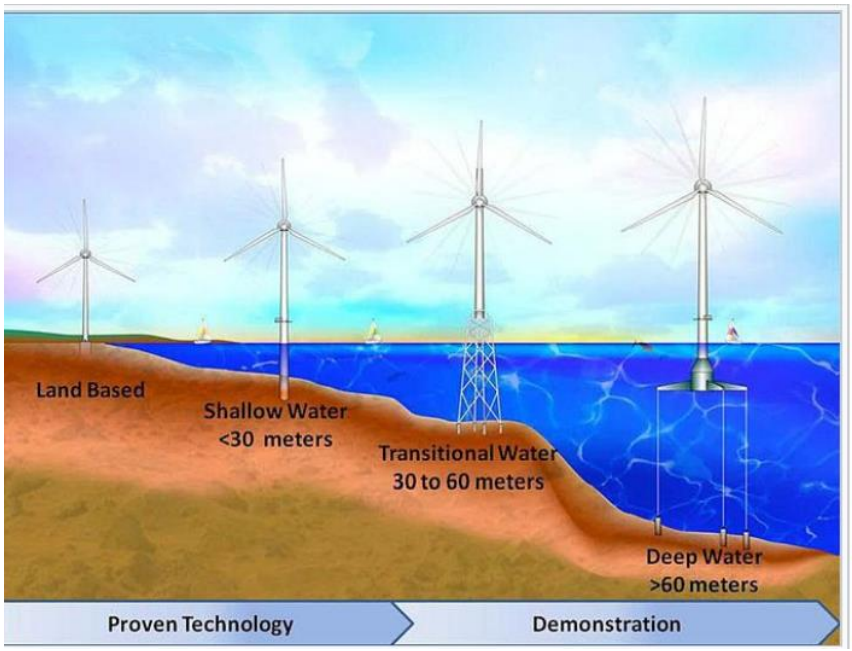

Figure 7 Progression of expected wind turbine evolution to deeper water. Produced by National Renewable Energy Laboratory. https://commons.wikimedia.org/wiki/File:Foundations_NREL.jpgm, reproduced under license at https://creativecommons.org/licenses/by-sa/2.5/deed.en.

Aquaculture

It is generally thought that both the relevant articles of UNCLOS and the provisions of the *Oceans Act* support coastal state jurisdiction in the EEZ for an open-ocean aquaculture industry. This jurisdiction would apply in the territorial sea. To the extent that aquaculture pens are attached to the ocean floor, they would be considered an installation or structure, similar in some respects to offshore wind farms. An aquaculture industry in the EEZ would be also subject to the coastal state's obligation to protect and preserve the marine environment.[132]Again, however, there is currently no regulatory framework in Atlantic Canada that will support an aquaculture industry in the EEZ or in the territorial sea.

[131] *UNCLOS*, *supra* note 115, art 56.1(b)(iii).
[132] *Ibid*.

Figure 8 Fish cages in Velfjorden, Brønnøy, Norway. By Thomas Bjørkan File:Fish cages.jpg, reproduced under license at https://creativecommons.org/licenses/by-sa/2.5/deed.en.

Figure 9 Scuba diving worker and 3000 cubic meter submersible fish pen installed in open ocean to raise Hawaiian yellowtail.

The Domestic Rules: Canada's Constitutional System

Understanding how Canada's constitutional system affects the regulation of ocean resource activities is also crucial.

The property rights and legislative powers most relevant to ocean resources fall exclusively to the federal level of government.[133] Moreover, as discussed above, domestic rights in ocean resources beyond Canada's internal waters arise under international law, which generally does not give rights to federal states' constituent sub-units (i.e., the Provinces); [134] whatever international rights Canada has in its oceans fall to the national government.[135] Provincial proprietary rights and legislative jurisdiction are also confined to the province's territory.[136] In most cases, provincial territory ends at the low water mark,[137] further constraining coastal provinces' constitutional role in ocean management.

The reality, however, is that coastal provinces often regulate some aspect of marine activities. More importantly, the case can be made that they should play a larger role as a matter of policy. Little, if any, ocean-based economic activity occurs entirely offshore; significant aspects of such work invariably occur on dry land. Thus, despite exclusive federal jurisdiction, cooperation with adjacent coastal provinces is a practical necessity – assuming the goal is effective and comprehensive regulation of ocean resources development. As Justice Gerald La Forest noted, "federal-provincial cooperation will on many occasions

[133] *Constitution Act, 1867* (UK), 30 & 31 Vict, c 3, reprinted in RSC 1985, Appendix II, No 5, s 91.
[134] H Kindred et al, eds, *International Law: Chiefly as Interpreted and Applied in Canada*, 7th ed (Toronto: Emond Montgomery Publications Limited, 2006) at 38-43; *Reference re Offshore Mineral Rights (British Columbia)* [1967] SCR 792, 65 DLR (2d) 353 ["*BC Offshore Reference"*].
[135] See *Hibernia Reference*, *supra* note 126.
[136] P Hogg, *Constitutional Law of Canada*, 2006 Student Ed (Toronto: Thomson Carswell, 2006) at 318.
[137] See *BC Offshore Reference*, *supra* note 134.

be required for a full and rational development of water resources."[138] Adjacency to ocean resources also has important political consequences: those who have historically depended most on oceans are the inhabitants of coastal provinces.[139] Indeed, the federal government has acknowledged that in the oil and gas industry[140] and fisheries,[141] coastal adjacency plays a role in the allocation of benefits from ocean resources.

Finally, the constitutional recognition and affirmation of existing Aboriginal and treaty rights[142] in 1982 has influenced Canada's ocean resources regulation. The Supreme Court of Canada's development of the duty to consult Indigenous peoples and body of the *Constitution Act's* section 35 jurisprudence has had a measurable influence on the regulation and allocation of ocean resources.

Each of these constitutional issues affects oceans governance in Canada.

Division of Powers under the *Constitution Act, 1867*

There is no single head of power for "oceans" within sections 91 and 92 of the *Constitution Act, 1867.* As Justice La Forest notes, "all but a few of the legislative powers given to the federal and provincial governments under the British North America Act may in some way or other affect the development of water resources".[143] Nevertheless, some specific powers, wholly on the federal side, are directly relevant to oceans governance. Other, mainly provincial, powers allow for limited incidental regulation of aspects of ocean activities.

Federal Jurisdiction: Section 91

All ocean-specific powers fall under exclusive federal jurisdiction. In addition to laws for the "peace, order and good government of Canada" ("**POGG**"), the exclusive legislative authority of Canada's federal government extends to all matters coming within the following subjects, or "heads of power": "Beacons, Buoys, Lighthouses, and Sable Island" (section 91(9)); "Navigation and Shipping" (section 91(10)); "Sea Coast and Inland Fisheries" (section 91(12)); and "Ferries between a Province and any British or Foreign Country" (section 91(13)). The federal government thus has exclusive authority to legislate in relation to the traditional ocean uses of navigation and shipping, and fisheries.

The residual federal power to legislate under the POGG clause is also important in the oceans context. Activities such as offshore oil and gas, ocean-based renewable energy or open-ocean industrial aquaculture did not exist in 1867; thus, no heads of power specifically allocate legislative authority to the federal level of government or the provincial legislatures over such subjects.[144] Under the POGG clause, the federal government may legislate in respect of ocean uses not contemplated at Confederation and therefore not enumerated in sections 91 and 92 of the *Constitution Act, 1867*. The Supreme Court of Canada has confirmed this residual federal legislative power applies to offshore oil and gas activities.[145] It will undoubtedly also apply to emerging ocean activities, like ocean-based renewable energy or open-ocean industrial aquaculture, occurring beyond provincial territory.

[138] G V La Forest, ed, *Water Law in Canada: The Atlantic Provinces* (Ottawa: Information Canada, 1973) at 17.
[139] Not least of which inhabitants are the Indigenous peoples of Canada's coasts, many of whom have depended on ocean resources since time immemorial.
[140] See Part 4 International and Domestic Framework.
[141] Department of Fisheries and Oceans' "New Access Framework", which sets out the principles by which new or additional access will be allocated where Atlantic Canadian commercial fisheries have undergone substantial increases in resource abundance or landed value, requires consideration of principles of "adjacency" and "historical dependence". "New Access Framework", *Fisheries and Oceans Canada* (2008) ["New Access Framework"], online: <www.dfo-mpo.gc.ca/reports-rapports/regs/access-acces-eng.htm>.
[142] *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982, c 11.
[143] La Forest, *supra* note 138 at 4.
[144] However, the fisheries and navigation and shipping powers will certainly govern aspects of such activities.
[145] See *BC Offshore Reference*, *supra* note 134; *Hibernia Reference*, *supra* note 126.

Parliament also has authority over "federal undertakings" otherwise located within a province. Section 91(29) authorizes the federal government to legislate in respect of matters "expressly excepted" from the powers assigned exclusively to the provinces in section 92. Section 92(10) assigns the provinces power to regulate "local works and undertakings", but specifically excludes certain works and undertakings that extend to another province or country. Among these exclusions are any works or undertakings located wholly within the province but "declared by the Parliament of Canada to be for the general advantage of Canada". This "declaratory" power allows for federal regulation of federal works and undertakings, even if key elements of such works are located within a province; enumerated examples include railways, ships and telegraph cables. The primary import here is the federal power to regulate international and designated inter-provincial electrical transmission lines, as well as federal authority over the export from Canada of electricity.

Provincial Jurisdiction: Sections 92 and 92A

The primary bases of provincial authority set out in section 92 of the *Constitution Act, 1867* in relation to ocean uses are: the management and sale of the public lands belonging to the province (section 92(5)); local works and undertakings (section 92(10)); property and civil rights in the province (section 92(13)); and all matters of a merely local or private nature in the province (section 92(16)). Section 92A further permits the provinces to legislate with respect to: the exploration for non-renewable natural resources in the province; the development, conservation and management of non-renewable natural resources and forestry resources in the province, including laws in relation to the rate of primary production from such resources; and the development, conservation and management of sites and facilities in the province for the generation and production of electrical energy.

Though largely limited to dry land, provincial legislative authority will nevertheless play some role in any comprehensive regulatory system for ocean resources management.

First, Canada's constitution permits the incidental operation of otherwise valid provincial law in relation to ocean activities primarily governed by federal law. As the Supreme Court of Canada states, "merely incidental effects [of provincial law] will not disturb the constitutionality of an otherwise intra vires [i.e., valid] law."[146] This kind of incidental operation is narrow, however, because the provincial law's overall focus and ambit must be within provincial territory. The law must deal, at its heart, with civil rights within the province or with other subjects assigned to the provinces under section 92. For instance, a workers' compensation scheme that applies to employers engaged in an industry "in the province" will cover accidents that occur at sea.[147] The upshot is a limited window for the incidental application of provincial laws dealing with civil rights or other valid subjects located within the province to "incidental" aspects of ocean resource activities, provided they do not improperly affect federal law.[148]

Second, and more importantly, ocean resource activities tend to also involve onshore activities that occur within one or more coastal provinces, or will depend on labour, material, capital or infrastructure located within such provinces. For instance, the production and sale of crude oil from offshore fields is supported

[146] *Canadian Western Bank v Alberta*, 2007 SCC 22 at para 28, [2007] 2 SCR 3 ["*Western Bank"*].
[147] *Marine Services International Ltd v Ryan Estate*, 2013 SCC 44, [2013] 3 SCR 53 ["*Marine Services"*] (interpreting the *Workplace Health, Safety and Compensation Act*, RSNL 1990 c W-11).
[148] Generally, there are two doctrines used to restrain a provincial law that has overstepped the jurisdictional bounds of s. 92. The preferred doctrine is federal paramountcy. Paramountcy holds that "when the operational effects of provincial legislation are incompatible with federal legislation, the federal legislation must prevail and the provincial legislation is rendered inoperative to the extent of the incompatibility." Paramountcy is triggered only where there are valid provincial and federal laws that conflict; in such cases, the federal law prevails. By contrast, interjurisdictional immunity operates on the "theory […] that each head of federal power not only grants power to the federal Parliament but, being exclusive, denies power to the provincial Legislatures." Thus, where provincial law "trenches on the protected 'core'" of an exclusive federal power in a manner that impairs that power, the provincial law will be inapplicable to the federal power. The doctrine is ruthless and operates even where Parliament has enacted no law within its exclusive jurisdiction. For this and other reasons, the Supreme Court has restricted its use. See *Western Bank*, *supra* note 146 at para 69; Hogg, *supra* note 136 at 412; *Marine Services*, *supra* note 147 at para 54.

by transshipment terminals. While offshore production is under federal jurisdiction, terminals located within a coastal province will be regulated largely by the province's laws. Similarly, many federally regulated fisheries depend on shore-based processing and export facilities, regulated to a large extent by the law of the province in which they are located.[149] Coastal provinces are thus likely to be a key market, transshipment or processing point for the ocean resources produced off their shores. For instance, ocean-based renewable energy sources may produce and transmit electricity, for instance, to coastal provinces' power grids; open-ocean aquaculture operations may land harvests at adjacent coastal provinces for processing, domestic sale or export. Aspects of these activities taking place within the coastal province will undoubtedly be governed by provincial law. If the goal is "full and rational" regulation of ocean resources development, the coastal provinces should be engaged.

Limits on Provincial Territory, Property and Jurisdiction

The language of the *Constitution Act, 1867* expressly limits provincial legislative competence to the province's territory. Section 92(13), for instance, gives the provincial legislatures authority to enact laws for "property and civil rights **in the province**" [emphasis added]. As a result, provinces have no legislative authority beyond their borders.[150] The location of these borders is significant for present purposes. The general rule is that the boundary is the ordinary low water mark, unless the province's boundary at the time of union extended beyond the low water mark to encompass submarine lands.[151] This rule is a significant constraint on provincial legislative authority over ocean resource activities and property rights in non-living ocean resources.

One exception to the low water mark assumption is for inland waters, such as harbours, bays or other waters lying "between the jaws of the land" (*inter fauces terrae*), which at common law form part of the adjacent county, and thus the province.[152] As Justice La Forest suggests, in Atlantic Canada, inland waters are extensive and "historic claims could be made that all bays in these provinces, including in particular the large bays, Chaleurs, Conception, Fundy and Miramichi, were inland bays."[153] It is this principle that allows the Atlantic Canadian provinces to issue near-shore aquaculture licences.[154]

The boundaries of some Atlantic Canadian provinces do extend beyond the low water mark. Those boundaries are found, in the case of Nova Scotia and New Brunswick, in the Governors' Commissions establishing those colonies,[155] and in the case of Newfoundland and Labrador, in section 2 of the 1949 Terms of Union. In particular, the boundary between New Brunswick and Nova Scotia was, before Confederation, drawn down the middle of the Bay of Fundy, while the boundary between New Brunswick and Quebec runs through the middle of the Bay des Chaleurs.[156] These historical borders were preserved following union.[157] As a result, New Brunswick and Nova Scotia are able to legislate directly in the Bay of Fundy, subject to paramount shipping, navigation, fisheries or other federal law. As discussed earlier,

[149] See e.g. *Fish Inspection Regulations*, NS Reg 286/84, made under the *Fisheries and Coastal Resources* Act, *supra* note 48.
[150] Hogg, *supra* note 136 at 318.
[151] *Ibid* at 319. *Reference re: Ownership of the Bed of the Strait of Georgia and Related Areas* [1984] 1 SCR 388 at 400, 8 DLR (4th) 161 ["*BC Straits Reference"*].
[152] Hogg, *supra* note 136 at 319; *BC Straits Reference*, *supra* note 151 at para 107; La Forest, *supra* note 138 at 464.
[153] La Forest, *supra* note 138 at 464. An important exception to the inland waters rule – the exception to the exception – is for public harbours, which became federal property at Confederation by virtue of s. 108 and the Third Schedule to the *Constitution Act, 1867*, *supra* note 133.
[154] In Prince Edward Island, aquaculture licences are issued by the federal Department of Fisheries and Oceans pursuant to a 1928 agreement between the Province and the Dominion of Canada.
[155] WR Lederman, "The Extension of Governmental Institutions and Legal Systems to British North America in the Colonial Period", *Continuing Canadian Constitutional Dilemmas* (Toronto: Butterworths, 1981) 63; and Archives of Nova Scotia, Oversize collection 333. It is by this process that the boundary between Nova Scotia and New Brunswick goes right down the centre of the Bay of Fundy, giving each province proprietary rights and legislative power over substantial submarine areas.
[156] La Forest, *supra* note 138 at 464; similarly, the boundary of British Columbia included the submarine lands in the straits between Vancouver Island and the mainland: see *BC Straits Reference*, *supra* note 151.
[157] *Constitution Act, 1867*, *supra* note 133, s 7.

this has enabled these provinces to proceed with tidal projects without need for direct federal involvement.

In most cases, however, the historical boundaries of Atlantic Canadian coastal provinces do not extend offshore.[158] Thus, territorial limits are a significant constraint on the provinces' ability to regulate ocean activities outside of inland waters, and a key consideration if the provinces are to play a direct role in the regulatory framework.

That the provinces are largely confined to dry land also affects ownership of non-living ocean resources. Under section 109 of the *Constitution Act, 1867*, all lands, mines, minerals and royalties belonging to the provinces at union continue to belong to the provinces "in which the same are situate or arise."[159] To the extent that the Atlantic Canadian provinces are confined to dry land, they do not own the submarine lands below the low water mark outside of inland waters, nor any mineral resources on or under such lands. As discussed earlier, the ownership of such lands and resources under the waters of the territorial sea vests in the federal Crown. Beyond the territorial sea, Canada does not "own" the seabed, subsoil or living and not-living resources in the water column, but has certain rights and jurisdiction under international law.

International Law and the Provinces

Canada's sovereign territory ends at the outer limit of the 12 NM territorial sea, as explained in the previous discussion of UNCLOS. These territorial sea rights, although asserted domestically in the *Oceans Act*, are in fact "conceded" by international law.[160] Beyond its inland waters, Canada's proprietary (or quasi-proprietary) rights to and jurisdiction over the sea, seabed and subsoil arise under international law. The nature of these international law rights is a further legal obstacle to coastal provinces' ability to regulate ocean resource activities.

In the *Hibernia Reference,* the Supreme Court of Canada was asked to determine whether Canada or the Province of Newfoundland had the rights to explore and exploit the subsea mineral resources of the Hibernia field, which lies on the continental shelf 320 km east-southeast of St. John's. The Supreme Court characterized Canada's international legal rights to explore and exploit continental shelf resources as "an extraterritorial manifestation of, and an incident of, the external sovereignty of a coastal State."[161] As discussed earlier, provinces cannot legislate extraterritorially. Nor, held the Supreme Court, do the provinces exercise "extraterritorial sovereignty." As a result, the sovereign rights in and jurisdiction over ocean resources granted under UNCLOS fall to Canada. The coastal provinces lack statehood and therefore have no claim to international legal rights over ocean resources, despite their constituents' historical intimacy with the ocean and its resources.

Section 35: The Rights of Canada's Indigenous Peoples

The constitutional protection of the Aboriginal and treaty rights of Aboriginal peoples under section 35 of the *Constitution Act, 1982* has had an enormous impact on the regulation of resource development in Canada, including in the ocean resources context. For instance, the Supreme Court of Canada's decision in *R v. Sparrow*[162] determined that Aboriginal rights to fish for food, social and ceremonial purposes have priority over all fisheries interests but conservation. The *Sparrow* decision compelled DFO to develop the

[158] La Forest, *supra* note 138 at 465.
[159] *Constitution Act, 1867*, *supra* note 133, s 109. See, to similar effect, s. 2 of the Terms of Union under which Newfoundland became a province.
[160] See *UNCLOS*, *supra* note 115, arts 2–3; *BC Offshore Reference*, *supra* note 134 at 800–809.
[161] *Hibernia Reference*, *supra* note 126 at 97. In the *BC Offshore Reference*, *supra* note 134 at para 81, the Supreme Court concluded to the same effect about the (then-three NM) territorial sea off British Columbia: "It is Canada which is recognized by international law as having rights in the territorial sea adjacent to the Province of British Columbia".
[162] *R v Sparrow*, [1990] 1 SCR 1075, 70 DLR (4th) 385.

Aboriginal Fisheries Strategy, marking a sea change in the regulator's treatment of the rights of Canada's Indigenous peoples. Similarly, in *R v. Marshall*,[163] the Supreme Court of Canada determined that Maliseet and Mi'kmaq First Nations in Nova Scotia, New Brunswick, Prince Edward Island and Quebec have an existing treaty right under the 1760 and 1761 treaties to fish for a "moderate livelihood", beyond mere sustenance. DFO responded with the *Marshall* Response Initiative, under which DFO negotiated interim fisheries agreements with Maliseet and Mi'kmaq First Nations providing access to commercial fisheries. In Newfoundland & Labrador, the Innu and Inuit of Labrador have both asserted and existing rights with respect to ocean resources management and fisheries within the respective settlement areas.[164]

The "duty to consult," attendant to section 35 rights, has also had a major impact. In *Haida Nation v. British Columbia (Minister of Forests) ("**Haida**")*, the Supreme Court of Canada concluded that the Crown has a duty to consult with Indigenous peoples and, if necessary, accommodate their interests with respect to decisions about resource activities. Importantly, the duty exists regardless of whether the asserted right has been proven in court or acknowledged by the Crown. Where the right is proven, the obligation is a constitutional one, and the Crown must act in its capacity as a fiduciary for the Indigenous group. Where the right is yet unproven, the honour of the Crown necessitates a good faith process of consultation. The content of the duty to consult depends on the strength of the right asserted and the seriousness of the possible impact on the right by the resource activity; at the high end of the spectrum, the Crown may be required to accommodate the interests of the affected Indigenous peoples by ceasing or amending the proposed activity. While the Crown may delegate procedural aspects of the duty to consult to project proponents, the legal liability for satisfying it always remains with the Crown.[165]

The constitutional protection of Aboriginal and treaty rights and the Crown's duty to consult must be considered within any regulatory framework for resource activity in Canada, and ocean resource activities are no different. The issue is not that there is any Aboriginal or treaty right to engage in ocean-based renewable energy projects or industrial open-ocean aquaculture; such rights seem unlikely. Rather, the question in all cases will be whether any aspect of regulated ocean activities has, or may have, an adverse affect on rights or title asserted by Indigenous peoples of Atlantic Canada. If so, the Crown may have a duty to consult with the affected Indigenous group, and possibly accommodate its communal interests. A well-designed regulatory system will ensure the respective consultative obligations and rights of the project proponent, Indigenous peoples, regulatory agency, and provincial and federal governments are clearly defined and coordinated.

[163] *R v Marshall*, [1999] 3 SCR 533, 179 DLR (4th) 193.
[164] With respect to rights claimed by the Labrador Innu and under negotiation with the Crown, see "Labrador Innu Land Claims Agreement-in-Principle", *Indigenous and Northern Affairs Canada* (2012), online: <www.aadnc-aandc.gc.ca/eng/1331657507074>; with respect to Labrador Inuit treaty rights, see the "Land Claims Agreement Between the Inuit of Labrador and Her Majesty the Queen in Right of Newfoundland and Labrador and Her Majesty the Queen in Right of Canada", *Indigenous and Northern Affairs Canada* (2010), online: <https://www.aadnc-aandc.gc.ca/eng/1293647179208>.
[165] *Haida Nation v British Columbia (Minister of Forests)*, 2004 SCC 73, [2004] 3 SCR 511 ["*Haida"*].

PART 4 PROPOSED OCEAN RESOURCE REGULATORY REGIMES

The benefits to Atlantic Canada of open-ocean aquaculture and renewable energy projects will not materialize without regulatory conditions to support safe, sustainable and profitable development. These conditions are not yet in place.

We propose that the necessary conditions can best be established under a new system of joint federal-provincial regulatory agencies with the authority to regulate open-ocean aquaculture and ocean-based renewable energy activities beyond provincial territory in Atlantic Canada. The proposed regimes are based on the structure and key elements of Canada's existing regulatory regime for offshore oil and gas. This oil and gas regime was created in the face of the same international, constitutional, domestic legal and political issues that will bear on the proposed regulatory scheme for open-ocean aquaculture and ocean-based renewable energy activities. The oil and gas regime was the product of political compromise between the respective provinces and the federal government embodied in the *Atlantic Accord*[166] and the *Canada-Nova Scotia Offshore Petroleum Resources Accord* (*"***Offshore Accords***"*).[167] For over 30 years, this negotiated solution has provided a reasonably stable, mostly cooperative and relatively comprehensive joint regulatory regime governing hydrocarbon exploration and production in the huge east coast continental shelf. It therefore provides a good model for regulating new ocean resource activities.

Regulatory Objectives

The proposal is based on a two underlying assumptions and goals.

Priority Assumptions

First, we assume that human and ecological safety is always the first and highest priority on the oceans, and good regulation of ocean-based resources will always reflect the paramountcy of this priority. Next, good regulation will focus on the protection, conservation, and highest and best use of the resource being developed (more important for aquaculture than wind or tide); the most efficient working environment through coordination with other ocean uses; the sustainability of the ocean environment; and the creation and maintenance of benefit opportunities for the regulator's jurisdiction. These benefits may include the onshore processing of seafood, the onshore use of the renewable energy produced from ocean wind and tide, access to and perhaps ownership of technological advances made in pursuit of ocean resources development, and the employment of workers and the supply of goods from the coastal jurisdiction.

The Goal of Innovation

Second, given the new and innovative nature of the industries to be regulated, the regimes should be sufficiently flexible to allow the use of demonstrably safe new technologies. For instance, aquaculture companies seeking to move away from littoral sites face "huge engineering challenges" posed by the high-energy environment of the open ocean.[168] As a result, innovative companies have been developing a variety of new cage systems, netting materials, anti-predator devices, automated feed and fish-mortality

[166] Canada and Newfoundland and Labrador, "The Atlantic Accord: Memorandum of Agreement between the Government of Canada and the Government of Newfoundland and Labrador on Offshore Oil and Gas Resource Management and Revenue Sharing" (St John's: 11 February 1985) ["Atlantic Accord"].
[167] Canada and Nova Scotia, "Canada - Nova Scotia Offshore Petroleum Resources Accord" (Halifax: 26 August 1986) ["NS Accord"].
[168] Daniel Benetti & Aaron Welch, "Advances in Open Ocean Aquaculture Technology and the Future of Seafood Production" (2010) 5:2 J Ocean Technology 1 at 7.

removal equipment, and anti-fouling technologies.[169] To reduce risks to human safety and to increase productivity, open-ocean aquaculture will likely use autonomous vehicles, which may pose challenging legal questions. It is reasonable to assume that innovation will continue apace as open-ocean sites increase.

A goals-based (also known as performance-based) approach to regulation will augment the more traditional rules-based approach, particularly in dealing with technological change. It will permit and indeed require the most effective responses to the various subject matters to be regulated. It will not exclude innovation merely because the innovation post-dates the regulation. An overly prescriptive rules-based approach, however, might preclude the use of new and better technologies. Using the aquaculture example above, a rules-based regulation might specify which type of fish cage is required to be used in open-ocean sites within its jurisdiction, and set out in considerable detail the size, weight, exact materials, configuration of cage, based no doubt on the best scientific information available to the regulation-maker at the time. In contrast, goals-based regulation might specify the goals of human safety, environmental protection and fish welfare and some of the basic required parameters, but would then require the proponent to submit a report detailing the merits of the various options, proposing the option that best achieves the goal in the particular environment of deployment, and agree to review and revise the proposal until contract time based on new evidence of maximum safety.

Rules-based regulation may be appropriate where technology has been standard for a long time; it can specify, for example, CSA Group (formerly Canadian Standards Association) standards for the strength and weight of portable ladders on offshore installations.[170] Goals-based regulation is, however, generally more flexible and responsive to innovative solutions to particular situations. To be most effective, it requires a knowledgeable and flexible regulator that can ensure the proponent's submitted options are accurate and do not exclude other reasonable options, the selected option indeed is the best option, and all scientific and other data has been accurately assessed. The National Energy Board ("**NEB**") published in 2016 a paper[171] on performance-based regulation that describes the situations in which rules-based regulation remains appropriate, and the situations that demand the flexibility of goals-based regulation. It also discusses a third category of regulation, which it calls "management-system" regulation. This third category is, in essence, a branch of goals-based regulation; it focuses on the proponent's systems for managing energy projects, and perhaps most importantly, on systems for managing dangerous and emergency situations. The goal is to see in place effective management action plans, clear decision-making authority, and the availability of fast-responding resources necessary to deal with emergencies. This model of NEB regulation will be a good starting point for responsive ocean-based resource regulation.

Finally, not only should the regulatory system permit innovation by the regulated industry participants, it should also be designed to foster innovation by other ocean uses, including research activities and, where possible, allow for collaboration among regulated and non-regulated activities.

The Case for a Joint Federal-Provincial Solution

There is a strong case that joint federal-provincial management of ocean resource activities, achieved through political negotiation rather than the strict application of constitutional principles, is the more efficient, more expert, fairer and more responsive basis for ocean-based resource management. A joint federal-provincial effort similar to the offshore oil and gas regime is therefore an optimal solution. The

[169] *Ibid*.
[170] See *Canada – Nova Scotia Offshore Marine Installations and Structures Occupational Health and Safety Transitional Regulations*, SOR/2015-2, s 29(1) made under the *Canada – Nova Scotia Offshore Petroleum Resources Accord Implementation Act*, SC 1988, c 28.
[171] Peter Watson, *Performance-Based Regulation at Canada's National Energy Board*, prepared for the Transportation Research Board of the National Academy of Science (National Energy Board, 2016), online: <onlinepubs.trb.org/onlinepubs/pbr/Watson041416.pdf>.

adjacent coastal provinces stand to gain the most from safe, well regulated, and well-coordinated ocean resources development, and to lose the most – in lives lost, in improperly controlled environmental hazards and in lost economic opportunities – if regulation is less responsive to the conditions that prevail in each ocean-based resource development.

The federal government has exclusive proprietary rights and exclusive legislative powers with respect to ocean-based resources below the low water mark, except within internal waters and historic bays. This unbalanced allocation of rights and powers derives from the constitutional principles described earlier. These principles, while correct within Canada's constitutional framework, do not leave room for consideration of the merits of provincial involvement in the management of ocean-based resources. For a number of compelling reasons, coastal provinces should be involved in the management of ocean resources, despite the exclusive federal jurisdiction:

- Property and Civil Rights Expertise. Joint regulation allows the engagement and application of provincial legislative expertise in such areas as health and safety, property rights, and contractual rights. That expertise will help ensure optimum working conditions through such provincially-operated systems as workers' compensation, personal property rights registries and the priorities they establish, and builders' liens. The federal government has little or no experience in these and other areas that grow out of property and civil rights management within a province's exclusive domain under section 92(13) of the *Constitution Act, 1867.*

- Focus of Environmental Consequences. The onshore consequences of environmental spills or other contamination connected with ocean-based resource development will likely affect the coastal provinces more directly than other jurisdictions. Provincial input into environmental assessment, monitoring, protection and enforcement regulation will help ensure the least damage to the closest province and its shoreline businesses and residences.

- Fisheries' Contribution to Provincial Economy. Sensitive fisheries regulation has a strong and necessary provincial interest, especially to support the commercial fishing industries within each adjacent coastal province. Federal fishing licensee selection policy takes into account fishers' residence and historical dependence on fisheries, and a similar system with provincial regulatory input for open-ocean aquaculture can help ensure the maximum spin-off benefits of a potentially large economic generator for smaller coastal communities of the adjacent province.[172]

- Federal Recognition of Coastal Province's Right to be Principal Beneficiary of Ocean Resources. In the offshore oil and gas context, the federal government has agreed that adjacent coastal provinces should be the primary beneficiaries of offshore petroleum resources, and should have fiscal control over resource revenues as if the resource were within the provinces. One of the common purposes of the Offshore Accords is "to recognize the right of [the Province] to be the principal beneficiary of the oil and gas resources off its shores, consistent with the requirement for a strong and united Canada".[173] This concession also applies to ocean resources.

There are also benefits to federal involvement beyond the constitutional imperative:

- Regulatory Consistency across Coastal Provinces. A federal legislative basis for regulation constrains the coastal provinces' ability and occasional wont to enact regulatory schemes that differ from, and may be incompatible with, neighbouring provincial regimes. Federal primacy can impose a measure

[172] DFO policy is to consider "adjacency" and "historical dependence" when making decisions regarding new access to fisheries: see "New Access Framework", *supra* note 141.
[173] "Atlantic Accord", *supra* note 166, s 2(c); "NS Accord", *supra* note 167, s 1.02(c).

of regulatory consistency throughout Atlantic Canadian waters. Regulatory stability is attractive to industry and can enhance public trust, since industry rules are not in constant flux. A federally imposed constraint may help avoid a race to the bottom among coastal provinces competing for ocean resources investment. The Newfoundland and Labrador and Nova Scotia offshore oil and gas regime provides a good example, as it is based on the same rights issuance system[174] and operational laws[175] governing all oil and gas activities in the federally regulated "frontier" lands and offshore. Thus, despite some differences in practice among regulators, the underlying statutory framework and rules for offshore oil and gas are generally consistent across Canada.[176]

- Ocean Regulatory Expertise. Federal departments and agencies are already responsible for the ocean uses most likely to interact and conflict with new ocean resource activities: fisheries, shipping and navigation, and offshore oil and gas. These departments and agencies have institutional knowledge and experience in ocean resources management. The CNLOPB and CNSOPB experience indicates that any regulatory agency responsible for new ocean resource activities will undoubtedly interact with myriad other federal regulators.[177] Given this inevitable interaction, it makes sense that any additional ocean resources regulator also be a federal creature.

- Federal Role in Oceans Governance. Since the coming into force of the *Oceans Act* on January 31, 1997, the federal Minister of Fisheries and Oceans has been obligated to "lead and facilitate the development and implementation of a national strategy for the management of estuarine, coastal and marine ecosystems in waters that form part of Canada or in which Canada has sovereign rights under international law." This strategy is to be based on three principles: sustainable development; integrated management plans, which are to include the development and implementation of a national system of marine protected areas; and the precautionary approach.[178] The subsequent implementation of integrated oceans management under *Canada's Oceans Strategy*[179] and *Oceans Action Plan*[180] has moved slowly. However, progress on the integrated management of oceans uses required by the *Oceans Act* will likely be better advanced if the federal government is engaged in the new oceans resource regulatory systems.

A joint federal-provincial solution makes as much sense for open-ocean aquaculture and renewable energy projects as it does for offshore oil and gas. It is to that solution we now turn.

Proposed Ocean Resource Regulatory Regimes

We propose the establishment of two joint federal-provincial regulatory agencies responsible for regulating ocean-based renewable energy and open-ocean aquaculture. These agencies would be based on the structure of the existing offshore petroleum regimes overseen by the CNSOPB and CNLOPB ("**Petroleum Boards**") and would incorporate or emulate the following key elements of those regimes.

[174] *Canada Petroleum Resources Act*, RSC 1985, c 36 (2nd Supp) ["*CPRA*"].
[175] *Canada Oil and Gas Operations Act*, RSC 1985, c O-7 ["*COGOA*"].
[176] A current example is the current federal/provincial combined effort to update the regulations applicable frontier and offshore regulations in NEB, CNLOPB and CNSOPB jurisdictions, called the "Frontier and Offshore Regulatory Renewal Initiative", or FORRI.
[177] These include the CNSOPB, CNLOPB, the NEB, Transport Canada, Environment Canada, DFO and the Canadian Coast Guard, Transportation Safety Board, Diver Certification Board of Canada, Public Prosecution Service of Canada, Human Resources and Development Canada, and Natural Resources Canada: See, for instance, the long list of Memoranda of Understanding entered into between the CNSOPB and its regulatory partners: "Reference Materials", CNSOPB, online: <www.cnsopb.ns.ca/reference/reference-materials>.
[178] *Oceans Act*, *supra* note 23, ss 29–32, 35.
[179] *Canada's Oceans Strategy* (Ottawa: Fisheries and Oceans Canada, 2002), online: <waves-vagues.dfo-mpo.gc.ca/Library/264675.pdf>.
[180] *Canada's Oceans Action Plan: For Present and Future Generations* (Ottawa: Communications Branch Fisheries and Oceans Canada, 2005), online: <waves-vagues.dfo-mpo.gc.ca/Library/315255e.pdf>.

Establish joint federal-provincial regulatory bodies through "mirror" federal and provincial legislation.

In the Offshore Accords, the parties agreed to create, through mutual and parallel (or "mirror") legislation, unified administrative and fiscal regimes for the joint federal-provincial management of petroleum resources in the respective "offshore areas" defined in the Offshore Accords.[181] The federal government and the governments of Nova Scotia and Newfoundland & Labrador indeed established the CNSOPB[182] and CNLOPB[183] as the respective joint agencies responsible for the regulation of offshore petroleum activities pursuant to the *NS Accord Act* and the *NL Accord Act* ("**Accord Acts**").

The Accord Acts provide for joint federal-provincial management of oil and gas resources in the respective "offshore areas."[184] The Petroleum Boards each comprise an equal number of members appointed by each of the federal and provincial governments, and one jointly appointed chairperson.[185] They are jointly funded by the federal government and provinces.[186]

The use of similar mirror federal-provincial legislation to establish joint regulatory boards for open-ocean aquaculture and renewable energy would overcome the constitutional impediments to provincial involvement. It requires the parties to consider and ultimately agree on policy objectives, as well as the form and content of the resulting legislation and regulations. Given the relative inattention paid to open-ocean aquaculture and offshore renewable energy to date, a serious attempt by the parties to engage and negotiate a solution would likely represent some progress towards realizing the oceans opportunity.

Ensure regulatory consistency across the ocean resource regimes.

Under both Offshore Accords, the new regimes were to be "consistent, insofar as is appropriate, with regimes established for other offshore areas in Canada."[187] The Accord Acts are thus based on *CPRA* and *COGOA*,[188] providing regulatory consistency across all Canadian offshore oil and gas jurisdictions. As the Parliamentary Secretary to the Minister of Energy, Mines and Resources stated on third reading of the draft *NS Accord Act* in the House of Commons, "[t]his is highly desirable, from both an industry and government perspective, in ensuring consistently safe and well understood practices to be applied in all coastal areas."[189]

The proposed ocean resource regimes should have a consistent legislative basis across all coastal areas in Atlantic Canada; the underlying regulations should also be relatively uniform. Many industry participants can be expected to have cross-provincial operations, and will benefit from clear rules consistently applied across Atlantic Canada. Requiring consistency will also avoid the possibility of a regulatory race to the bottom. It is in this regard that the federal government's exclusive jurisdiction can impose a measure of order on the negotiations. While this may complicate negotiations by requiring multilateral agreements, the benefits of stability and consistency from an industry and social perspective are worth the effort.

[181] Atlantic Accord, *supra* note 166, s 1; NS Accord, *supra* note 167, preamble.
[182] *NS Accord Act*, *supra* note 130; *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*, SNS 1987, c 3. Where particular sections are referenced, the citation is to the federal statute.
[183] *NL Accord Act*, *supra* note 130; *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*, RSNL 1990, c C-2. Where particular sections are referenced, the citation is to the federal statute.
[184] *NL Accord Act*, *supra* note 130, s 8; *NS Accord Act*, *supra* note 130, s 8.
[185] *NL Accord Act*, *supra* note 130, s 10 (which creates a seven-member board); *NS Accord Act*, *supra* note 130, s 10 (creating a five-member board).
[186] *NL Accord Act*, *supra* note 130, s 28; *NS Accord Act*, *supra* note 130, s 28.
[187] "NS Accord", *supra* note 167, s 1.02(f); see also "Atlantic Accord", *supra* note 166, s 2(h).
[188] *Supra*, notes 174 and 175.
[189] *Minutes of Proceedings and Evidence of the Legislative Committee on Bill C-75*, 33rd Parl, 2nd Sess, House of Commons Issue No 1 (12 February 1987) at 1:17–1:18, 1:24–1:25, 1:27.

The jurisdiction of Nova Scotia and New Brunswick within the Bay of Fundy, described earlier, should be considered in this context. As Nova Scotia's tidal regime[190] indicates, these provinces do not strictly require federal cooperation to establish ocean resource regimes in the Bay of Fundy. For the sake of regulatory consistency, it would be preferable to subsume Nova Scotia's tidal regime and any other provincial regimes applicable in the Bay of Fundy into the proposed joint federal-provincial regimes, rather than to have different rules apply in it. The provinces' unique interest in this area might be accommodated within the joint regimes by granting them certain powers over regulatory decisions concerning the Bay of Fundy, as discussed later. To ensure consistency, the provinces' jurisdiction to regulate within inland waters, such as coves and bays, should also be subsumed with the proposed joint aquaculture and renewable energy regimes.

Ensure regulatory independence, with ministerial review limited to certain fundamental decisions.

The Petroleum Boards are independent regulatory agencies; their decisions on offshore management are final and not reviewable by either level of government.[191] However, the governments have reserved veto powers over certain "fundamental decisions."[192] The decisions deemed fundamental are, broadly, those relating to the issuance, amendment or cancellation of interests in the offshore, or those that require the operator to take onerous action, such as drilling orders.[193] Generally, the federal and provincial governments acting together can veto any fundamental decision, while the provincial government acting alone may veto fundamental decisions related to development plans.[194] The federal government also has the ultimate say over fundamental decisions if, in the federal minister's opinion, the decision at issue would unreasonably delay the attainment of national security of supply.[195]

The ocean resource boards' power to issue rights to proponents and to regulate the activities should also be independent, with ministerial review or approval restricted to only fundamental decisions. Regulatory independence provides for clearer, more consistent and predictable regulation than regulation by ministerial discretion. Where discretion is necessary – and it is necessary, if the regulation is to be sufficiently flexible – it should be for the regulator to exercise, guided by statutory considerations wherever possible.

Clear and consistent rules benefit industry proponents, the public and other stakeholders. For example, the authors of a 2014 report on Nova Scotia's aquaculture regulation concluded as follows:[196]

[190] See the discussion at Part 1 The Opportunity and the Reality.
[191] *NL Accord Act*, *supra* note 130, s 30; *NS Accord Act*, *supra* note 130, s 31.
[192] *NL Accord Act*, *supra* note 130, ss 31–39; *NS Accord Act*, *supra* note 130, ss 32–37.
[193]These include decisions to: prohibit the issuance of interests in particular area; prohibit an interest owner from carrying out activity; issue an interest; make a call for bids; attach terms and conditions to, amend, or consolidate an exploration licence; issue or attach terms and conditions to a significant discovery licence or production licence; extend the term of or consolidate a production licence; issue a drilling order; reduce the term of an interest in an area to which a commercial discovery declaration applies (*i.e.* issue a development order); issue a licence for subsurface storage; cancel an interest; and approve Part I of a development plan. See *NL Accord Act*, *supra* note 130, ss 54, 56, 57, 58, 60, 61, 67, 68, 73, 79, 81, 82, 84, 123, 139(4)(a); *NS Accord Act*, *supra* note 130, ss 57, 59, 60, 61, 64, 70, 71, 76, 79, 82, 89, 126, 143(4)(a).
[194] *Ibid.* The Province of Nova Scotia can also veto a Board decision with respect to a call for bids in relation to, or interests in relation to, a portion of the offshore area that is situated wholly within the Bay of Fundy or Sable Island: *NS Accord Act*, *supra* note 130, s 35(b)(ii). This power is based on these areas being within provincial territory.
[195] *NL Accord Act*, *supra* note 130, ss 34–37; *NS Accord Act*, *supra* note 130, ss 35(2)–37. The federal government can also compel the Board, in the event of a sudden domestic or import supply shortfall of suitable crude oil and equivalent substances, to cause production to be increased, consistent with good oil field practice: *NL Accord Act*, *supra* note 130, s 40; *NS Accord Act*, *supra* note 130, s 38.
[196] W Lahey & M Doelle, "A New Regulatory Framework for Low-Impact/High-Value Aquaculture in Nova Scotia: The Final Report of the Independent Aquaculture Regulatory Review for Nova Scotia", *Schulich School of Law, Dalhousie University* (2014) at 24. The rules for the award of development rights for ocean-based resource projects must avoid unnecessary complication and confusion; a "very complex licensing procedure" is cited as a primary cause of stagnation in the development of an offshore wind farm industry in Germany: Bela H Buck & Gesche Krause, "Integration of Aquaculture and Renewable Energy Systems" in Robert A Meyers, ed, *Encyclopedia of Sustainability Science and Technology* (Springer, 2012) 511.

> For example, community concerns about the content and adequacy of the rules under which aquaculture operates is understandable given that those rules are overwhelmingly found in the terms and conditions of each operators lease and licence. Similarly, industry concerns about the predictability and dependability of regulatory decision making is partly a result of the open-ended nature of the discretion the legislation gives to the Minister of Fisheries and Aquaculture.

The decisions considered fundamental would differ between the aquaculture and renewable energy contexts. Security of supply, for instance, has no bearing on aquaculture products. However, decisions related to rights issuance, amendment and cancellation, and any regulatory decisions with particularly onerous implications for proponents, should be common to both regimes. Consideration should be given to the provinces' retention of some form of veto power over decisions affecting renewable energy supply, with the federal government having the ultimate say on any international energy exports. As noted earlier, New Brunswick and Nova Scotia might be accorded special rights concerning decisions related to the Bay of Fundy.[197] Other vital federal or provincial interests would also be subject to negotiation.

The requirement that the ocean resource boards provide notice to the Ministers of fundamental decisions, with a period after which the governments will be deemed to have consented, should be adopted.[198]

The boards should have ongoing regulatory control over operations for the entire project life cycle.

The Petroleum Boards have ongoing regulatory supervision of operations, commencing with exploration activities and continuing through to decommissioning and abandonment. These aspects include: health and safety of workers; environmental protection; petroleum resource conservation and management; administration of the provisions related to industrial and employment benefits plans; issuance of rights for exploration, development and production; and resource evaluation, data collection, curation and distribution.[199]

The Petroleum Boards act as gatekeeper to all oil and gas work and activity in the offshore areas. Under the Accord Acts, no person shall carry on any work or activity related to petroleum in the offshore area unless that person has obtained from the relevant Petroleum Board an operating licence and a work authorization for each such work or activity.[200] Work authorizations are issued subject to such approvals, requirements or deposits as that Petroleum Board determines or as are prescribed by regulation.[201] The Petroleum Boards are expressly required to ensure that the applicant has satisfied the financial responsibility and benefits plans provisions of the Accord Acts (discussed further later) before issuing a work authorization.[202] They typically may also attach requirements for compliance with Petroleum Board guidelines (the making of which is expressly permitted under the Accord Acts)[203], environmental studies or plans, health and safety and cost recovery.

The ocean resource boards should have the same authority and obligation to regulate operations over the project life-cycle. In the context of both aquaculture and ocean-based renewable energy, the regulatory aspects would include health and safety, environmental protection, benefits plans, rights issuance and data

[197] As noted above, Nova Scotia can veto CNSOPB decisions with respect to a call for bids in relation to, or interests in areas within the Bay of Fundy or Sable Island: *NS Accord Act*, *supra* note 130, s 35(b)(ii).
[198] *NL Accord Act*, *supra* note 130, s 31; *NS Accord Act*, *supra* note 130, s 32.
[199] See "About Us: What We Do", CNSOPB, online: <www.cnsopb.ns.ca/about-us/what-we-do>.
[200] *NL Accord Act*, *supra* note 130, s 137; *NS Accord Act, supra* note 130, s 140.
[201] *NL Accord Act*, *supra* note 130, s 138(4)–(4.1); *NS Accord Act*, *supra* note 130, s 142(4)–(4.1).
[202] *NL Accord Act*, *supra* note 130, ss 45(2), 138.3; *NS Accord Act*, *supra* note 130, ss 45(2), 142.3.
[203] *NL Accord Act*, *supra* note 130, s 151.1; *NS Accord Act, supra* note 130, s 156.

collection, curation and distribution. Resource evaluation in the aquaculture and renewable energy contexts, however, would not have the same importance as in the oil and gas context. In both contexts, the subject matter of the proposed boards' jurisdiction should be defined broadly enough to capture any forms of activity that are not currently feasible. For instance, although waves are not yet a viable commercial source of power, the ocean-based renewable energy boards' jurisdiction should encompass wave energy projects in addition to more mature wind and tidal technologies.

On the topic of flexibility, the ocean resource boards should have a sufficiently detailed protocol to address the legally nebulous but politically responsive concept of "social license". When social groups voice concerns that are not reflected in the governing legislation, they may perceive those regulatory "gaps" as social injustice and a breach of public trust, and may take action to alter or derail a project outside the regulatory framework for public input. The ocean resource boards must be able to respond appropriately, to allow the constructive expression of social concerns and to maintain the certainty that the regulatory process needs to balance the interests of all stakeholders.

These boards must also have authority to permit research activities and testing of new technologies within their geographical and subject matter jurisdictions. The authority to identify or respond to and permit innovative collaborations between or among ocean uses should also be permitted within the regulatory regimes; the co-location of offshore wind turbines and shellfish aquaculture farms, for instance, might produce supply chain synergies and reduce the likelihood of conflicting interests.

The Petroleum Boards' authority to issue authorizations subject to approvals and requirements is a broad one, restricted only to the extent that the approvals and requirements cannot be inconsistent with the Accord Acts or regulations.[204] As others have noted, the Petroleum Boards sometimes use their power to attach approvals and requirements to authorizations as a means of filling gaps in the Accord Acts.[205] Given the difficulty of aligning all the parties necessary to amend the Accord Acts or regulations, this practice allows the Petroleum Boards to regulate effectively where the legislation has not kept up with new technologies or has gaps. However, the practice of regulation by approval is less satisfactory, from a legal perspective, than legislation without gaps or regulations that can accommodate emerging technologies and issues: it is susceptible to challenge on the basis that the approvals or requirements are inconsistent with the enabling legislation. To the extent possible, the new regimes should improve on this situation.

The new regimes could also improve upon the Accord Acts' provisions on liability for damage or loss caused by a facility after decommissioning and abandonment. Under the Accord Acts, the holder of an authorization for a particular work or activity is liable, without proof of fault or negligence, for damage or loss caused by spills, discharges or debris from the authorized work.[206] No-fault or "absolute" liability exposure under the Accord Acts continues for the duration of the work for which the authorization is issued.[207] The relevant Petroleum Board can require holders of drilling, development or production authorizations to maintain proof of financial resources to satisfy the absolute liability amount for up to one year after the Petroleum Board notifies the holder that it has accepted a report that the last well subject to the authorization is abandoned.[208] However, while it may be implied, the Accord Acts do not expressly state that absolute liability continues during this extended period if the authorization has terminated. There are also no provisions dealing with situations where an authorization holder is insolvent or ceases to exist before or after decommissioning and abandonment, such as orphaned well provisions.

[204] *NL Accord Act*, *supra* note 130, s 138(4.1); *NS Accord Act*, *supra* note 130, s 142(4.1).
[205] Denstedt & Thrasher, "The *Accord Acts* Twenty Years Later" (2007) 30 Dalhousie LJ 287 at 294.
[206] *NL Accord Act*, *supra* note 130, ss 162(1)(b), 162(2)(b); *NS Accord Act*, *supra* note 130, ss 167(1)(b), 167(2)(b).
[207] *NL Accord Act*, *supra* note 130, s 162.1(4); *NS Accord Act*, *supra* note 130, s 167.1(4).
[208] *NL Accord Act*, *supra* note 130, s 162.1(5); *NS Accord Act*, *supra* note 130, s 167.1(5).

The new regimes should provide more clarity than the Accord Acts with respect to the operators' and regulators' responsibilities at the end of the project life-cycle.

Provincial control over revenues from, and fiscal-type mechanisms in, the offshore area, with employment and industrial benefits flowing primarily to the coastal provinces.

In the Offshore Accords, the federal government conceded that the provinces would receive fiscal revenues from offshore production and be the primary beneficiaries of offshore development and related employment and industrial activity. One of the express purposes of the Offshore Accords is:[209]

> to recognize the right of [the Province] to be the principal beneficiary of the oil and gas resources off its shores, consistent with the requirement for a strong and united Canada […]

The Accord Acts reserve and make payable to the federal government the petroleum-related royalties, interest and penalties that would be payable under the respective provincial oil and gas legislation if the petroleum were produced from areas within the respective provinces.[210] Thus, provincial oil and gas fiscal legislation[211] is effectively applied to the offshore areas. The Petroleum Boards are not responsible for setting or administering these royalties; the federal government collects them on behalf of and pays the revenues over to the provinces, fulfilling the promise set out in the Offshore Accords.

There is no principled reason why the federal recognition of provincial rights in the Offshore Accords should not apply equally to open-ocean aquaculture or renewable energy development. Canada's right to permit and regulate such activities beyond its internal waters arises under international law, just as it does for oil and gas. The legal basis for these rights is thus indistinguishable from those in offshore oil and gas.[212] The new ocean resource regimes should proceed on the same assumption: the provinces should control revenues from the resources as if they were on land within the province, and industrial and employment benefits from the activities should flow primarily to the provinces.

The Accord Acts' provisions for royalties payable to the governments for petroleum resource use are probably not applicable (or applicable only with major adaptation) in the aquaculture and renewable energy contexts. Farmed fish and renewable energy are not Crown property to which royalties would historically attach. Further, industries regulated as public utilities (such as electricity generation and transmission) and industries that enjoy government assistance (such as many kinds of farming) do not generate sufficient profits to bear government royalties. Though royalties are probably not appropriate, the provinces should nevertheless have responsibility for and control of revenues from the new ocean resource activities through provincial-type fiscal instruments.

The Accord Acts' provisions on industrial and employments benefits plans, however, are directly applicable to newer ocean resource activities. The Accord Acts require that proponents submit and obtain approval of "benefits plans" as a condition of operating offshore.[213] A benefits plan is defined as,[214]

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[209] "Atlantic Accord", *supra* note 166, s 2(c); "NS Accord", *supra* note 167, s 1.02(c).
[210] *NL Accord Act*, *supra* note 130, ss 97–100; *NS Accord Act*, *supra* note 130, ss 99–100.
[211] In NL, see: *Petroleum and Natural Gas Act*, RSNL 1990, c P-1; and in NS, see: *Offshore Petroleum Royalty Act*, SNS 1987, c 9.
[212] The principle might be distinguished if there existed an overriding public right to conduct these activities traceable to the *Magna Carta*, such as the public rights to fishing and navigation in tidal and navigable waters. For instance, the federal government has not ceded to the coastal provinces any rights in respect of wild capture fisheries, which are considered a "'common property resource', belonging to all the people of Canada": *Comeau's Sea Foods Ltd v Canada (Minister of Fisheries & Oceans*), [1997] 1 SCR 12 at paras 37, 142 DLR (4th) 193. However, open-ocean aquaculture is not a public fishery activity. Nor are renewable energy projects or open-ocean aquaculture incidents of the public right of navigation.
[213] *NL Accord Act*, *supra* note 130, s 45; *NS Accord Act*, *supra* note 130, s 45.
[214] *NL Accord Act*, *supra* note 130, s 45(1); *NS Accord Act*, *supra* note 130, s 45(1).

> a plan for the employment of Canadians and, in particular, members of the labour force of the Province and, subject to paragraph (3)(d), for providing manufacturers, consultants, contractors and service companies in the Province and other parts of Canada with a full and fair opportunity to participate on a competitive basis in the supply of goods and services used in any proposed work or activity referred to in the benefits plan.

Petroleum Board approval of benefits plans is a pre-condition for the issuance of work authorizations and the approval of development plans.[215] Benefits plan requirements are prescribed in the Accord Acts:[216]

> 45 (3) A Canada-Nova Scotia [or Newfoundland & Labrador] benefits plan shall contain provisions intended to ensure that
>
> > (a) before carrying out any work or activity in the offshore area, the corporation or other body submitting the plan shall establish in the Province an office where appropriate levels of decision-making are to take place;
> >
> > (b) consistent with the *Canadian Charter of Rights and Freedoms*, individuals resident in the Province shall be given first consideration for training and employment in the work program for which the plan was submitted and any collective agreement entered into by the corporation or other body submitting the plan and an organization of employees respecting terms and conditions of employment in the offshore area shall contain provisions consistent with this paragraph;
> >
> > (c) a program shall be carried out and expenditures shall be made for the promotion of education and training and of research and development in the Province in relation to petroleum resource activities in the offshore area; and
> >
> > (d) first consideration shall be given to services provided from within the Province and to goods manufactured in the Province, where those services and goods are competitive in terms of fair market price, quality and delivery.

The Petroleum Boards may also require that benefits plans include provisions to ensure that disadvantaged individuals or groups have access to training and employment opportunities and can participate in the supply of goods and services contemplated in the proposed activity.[217]

While the details of benefits required for a project should be left to the regulators (possibly subject to a provincial veto), the new regimes should incorporate a similar framework ensuring that industrial and employment benefits from ocean resource activities flow primarily to the provinces.

[215] *NL Accord Act*, *supra* note 130, ss 45(2), 138.3; *NS Accord Act*, *supra* note 130, ss 45(2), 142.3.
[216] *NL Accord Act*, *supra* note 130, s 45(3); *NS Accord Act*, *supra* note 130, s 45(3).
[217] *NL Accord Act*, *supra* note 130, s 45(4); *NS Accord Act*, *supra* note 130, s 45(4).

Ensure a clearly defined role with respect to environmental assessments.

The Petroleum Boards are also responsible for environmental issues relating to oil and gas activities, including environmental assessments ("**EAs**"). However, they do not provide "single-window" regulation with respect to EAs: major offshore oil and gas activities will trigger EAs under *CEAA 2012*.[218] Under *CEAA 2012*, EAs are conducted by the "responsible authority" assigned to a particular activity; currently, the Canadian Environmental Assessment Agency ("**Agency**") is the responsible authority for offshore oil and gas activities to which *CEAA 2012* applies.

In 2015 and 2016, the federal government attempted to provide single-window regulation by allowing the Petroleum Boards to conduct EAs under *CEAA 2012.* Effective February 26, 2016,[219] both Petroleum Boards were given authority to hold public hearings, a precondition to qualify as responsible authorities under *CEAA 2012*.[220] Regulations designating the CNSOPB as a responsible authority under *CEAA 2012* were published in the *Canada Gazette* on June 27, 2015, but never enacted.[221] No regulations have been published with respect to the CNLOPB. Thus, the Agency remains responsible for EAs for designated offshore oil and gas activities. Projects that do not trigger *CEAA 2012* are subject to EAs conducted by the Petroleum Boards. For example, drilling and production regulations require the proponent to submit an environmental protection plan as a condition of authorization.[222] The Petroleum Boards will also require proponents to submit an environmental impact statement as a condition of development plan approval.[223]

The new ocean resource boards must be responsible for environmental protection, and should have at least some level of responsibility for EAs. If the reviews of the NEB[224] and *CEAA 2012*[225] currently underway are any indication, whether resource industry regulators, the Agency, or some combination of them should be responsible for federal EAs going forward will surely be the subject of intense debate. Indeed, if the sweeping reforms proposed for *CEAA 2012* are accepted, federal EAs will be replaced with "all-encompassing" "impact assessments."[226] The future shape of federal EAs and who should conduct them are questions that cannot be answered here. Nevertheless, these issues should be carefully considered when designing the new ocean resource activity regulatory regimes.

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[218] *Supra* note 37. Under the *Regulations Designating Physical Activities*, SOR/2012-147, ss 10–13, the following activities are designated to fall under *CEAA 2012*: drilling, testing and abandonment of offshore exploratory wells in the first drilling program in an area; construction, installation and operation of a new offshore floating or fixed platform, vessel or artificial island used for the production of oil or gas; the decommissioning and abandonment of an existing floating or fixed platform, vessel or artificial island that is proposed to be disposed of or abandoned offshore or converted on site to another role; and the construction, operation, decommissioning and abandonment of anew offshore oil and gas pipeline, other than a flowline.

[219] *Energy Safety and Security Act*, SC 2015, c 4 ["*ESSA"*], ss 41, 51, adding *NL Accord Act*, *supra* note 130, ss 44.1, 138.01; *ESSA*, ss 77, 87, adding *NS Accord Act*, *supra* note 130, ss 44.1, 142.02.

[220] *Supra*, note 37, s 15(c).

[221] See the draft "Federal Authority as a Responsible Authority for Designated Projects Regulations: Regulatory Impact Analysis Statement", (2015) 149:26 Can Gaz, online: <gazette.gc.ca/rp-pr/p1/2015/2015-06-27/html/reg5-eng.php>. At the time of publication in the Canada Gazette, the CNLOPB was apparently not yet willing take on the "responsible authority" role.

[222] *Newfoundland Offshore Petroleum Drilling and Production Regulations*, SOR/2009-316, ss 6(d), 9; *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, ss 6(d), 9;

[223] "Development Plan Guidelines", CNLOPB (February 2006) at para 1.3.2, online: <http://www.cnlopb.ca/pdfs/guidelines/devplan.pdf>; "Guidelines on Plans and Authorizations Required for Development Projects", CNSOPB (16 August 1995) at para 2.3, online <http://www.cnsopb.ns.ca/sites/default/files/pdfs/plansauthoriazations.pdf>.

[224] See "Forward Together: Enabling Canada's Clean, Safe and Secure Energy Future: Report of the Expert Panel on the Modernization of the National Energy Board", *National Energy Board* (May 2017) at 41, online: <https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/pdf/NEB-Modernization-Report-EN-WebReady.pdf> (in which the authors recommend that two year EAs for all major and significant projects be conducted jointly by the Agency and the proposed Canadian Energy Transmission Commission).

[225] See "Building Common Ground: A New Vision for Impact Assessment: The Final Report of the Expert Panel for the Review of Environmental Assessment Processes", *Canada Environmental Assessment Agency* (2017), online: https://www.canada.ca/content/dam/themes/environment/conservation/environmental-reviews/building-common-ground/building-common-ground.pdf.

[226] *Ibid* at 13.

Ensure a clearly defined role with respect to consultation with Canada's Indigenous peoples.

The Crown's duty to consult with and, where necessary, accommodate the interests of Indigenous peoples may be triggered, depending on the location and type of ocean resource activity conducted. For instance, as noted earlier, Mi'kmaq and Maliseet First Nations in P.E.I., Quebec, New Brunswick and Nova Scotia have constitutionally protected treaty rights to commercial fishing.[227] Under the Accord Acts, however, neither Petroleum Board has any express statutory obligation or authority to consult with Indigenous groups nor any clear statutory mandate to ensure, as part of the project approval process, that the Crown has discharged its duty to consult. This is hardly surprising: the Accord Acts were drafted about 15 years before the Supreme Court of Canada first pronounced on the duty to consult in *Haida* and its companion cases.

While the government may delegate procedural aspects of the duty to consult to project proponents, the legal liability for satisfying the duty always remains with the Crown.[228] There are a variety of legal frameworks through which the Crown can meet its duty to consult. For instance, the legislature may establish separate regulatory schemes or provide guidance to government officials through policy documents[229] or use sufficient existing statutory processes, such as environmental assessment legislation.[230] Further, the legislature can delegate the Crown's duty to consult to a regulatory agency, or require the agency to determine whether adequate consultation has taken place, or neither, or both.[231]

It is unnecessary for present purposes to recommend that the proposed ocean resource boards be required or not required to enter into the constitutional consultation process. Given the diversity of federal and provincial interests involved in the proposed regulatory regimes, the role of the proposed boards with respect to consultation is a matter best left to negotiation between the federal government and coastal provinces. The point is that the legislation should clearly delineate the respective obligations on the proposed ocean resource boards, governments, Indigenous groups and project proponents; these interested parties should not have to wait for the courts to discover the regulators' role in the consultative process.

Consider, for instance, the guidance the Indigenous peoples, project proponents and the NEB might have taken from the 2015 Federal Court of Appeal decisions in *Hamlet of Clyde River v. TGS-NOPEC Geophysical Company ASA (TGS)*[232] ("***Clyde River***") and *Chippewas of the Thames First Nation v. Enbridge Pipelines Inc*.[233] ("***Enbridge***"). In *Clyde River*, a unanimous Court decided the NEB (an entity that similarly pre-dates the duty to consult by over 40 years) had a statutory mandate to actually engage in consultation such that the Crown could rely on that process to meet, at least in part, its duty to consult.[234] By contrast, in *Enbridge*, the Court decided the NEB did not even have a mandate to determine whether the Crown had a duty to consult or if so, whether it had discharged that duty; [235] the dissenting judge determined the NEB **must** have the power to determine whether the Crown discharged its duty, or a project could be approved without consultation.[236]

[227] *Supra*, note 163.
[228] *Haida*, *supra* note 165 at para 53.
[229] *Ibid* at para 51.
[230] See *Taku River Tlingit First Nation v British Columbia (Project Assessment Director)*, 2004 SCC 74 at para 40, [2004] 3 SCR 550.
[231] *Rio Tinto Alcan v Carrier Sekani Tribal Council*, 2010 SCC 43 at paras 55–58, [2010] 2 SCR 650.
[232] *Clyde River (Hamlet) v TGS-NOPEC Geophysical Co ASA*, 2015 FCA 179, [2015] FCJ No 991.
[233] *Chippewas of the Thames First Nation v Enbridge Pipelines Inc*, 2015 FCA 222, 390 DLR (4th) 735 ["*Enbridge"*].
[234] *Supra* note 232 at para 65, relying primarily on the provisions of the *Canadian Environmental Assessment Act*, SC 1992, c 37.
[235] *Enbridge*, *supra* note 233 at paras 64–66.
[236] *Ibid* at para 106.

That the Federal Court of Appeal arrived at decisions so painfully conflicted on the NEB's role in the consultation process is a clarion call for express legislative direction. While the Supreme Court of Canada has since confirmed that the Crown may rely on the NEB's regulatory process to partly or completely fulfill the Crown's duty to consult in certain circumstances,[237] guidance on such important issues through after-the-fact judicial pronouncement benefits no one. Whatever the ocean resource boards' role is to be in the consultation process, the legislation should clearly set it out. The duty to consult and the process of reconciliation it is meant to foster are too complex and too important to be continuously left to judicial haruspex, however well-intentioned.

Require coordination with other applicable departments and agencies.

The division of EA responsibility between the Petroleum Boards and Agency is one of many examples of other federal agencies being responsible for regulating some aspect of offshore oil and gas activities. As noted earlier, the NEB, Transport Canada, Environment Canada, DFO, the Coast Guard, Transportation Safety Board, Diver Certification Board of Canada, Public Prosecution Service of Canada, Human Resources and Development Canada and Natural Resources Canada, among others, all regulate some aspect of offshore oil and gas activities.[238] In this regard, the Accord Acts expressly mandate the Petroleum Boards to enter into memoranda of understanding with other agencies and departments in order to "ensure effective coordination and avoid duplication of work and activities."[239]
The problem of overlapping, duplicative and potentially conflicting regulatory requirements was described in the context of renewable energy regulation in a 2011 report as follows: [240]

> Regulatory practices are often viewed by project proponents as conflicted, providing protection to society consistent with accepted guidelines, while simultaneously slowing and complicating development activities which are also perceived as a benefit to society. Many firms considered to be good corporate citizens frequently complain about the "morass" or "swamp" they encounter when attempting to obtain approvals for their planned activities. These difficulties are often attributed to the multiplicity of jurisdictions that come into play, especially in the offshore, when a project is announced and set into motion.
>
> […]
>
> Problems encountered (as related by harried proponents) are often multifaceted: overlapping, duplicate or inconsistent legislative requirements and decision making; different policy formulations and advice from different regulators; administrators are said to lack independence, accountability and clear regulatory objectives; and, on occasion regulators seem to work at cross purposes, creating long lead times that undermine confidence in developers, investors and others

[237] *Clyde River (Hamlet) v. Petroleum Geo-Services Inc*., 2017 SCC 40 and *Chippewas of the Thames First Nation v. Enbridge Pipelines Inc*., 2017 SCC 41, where the Supreme Court of Canada quashed the approval granted by the NEB in *Clyde River* and upheld the approval granted by the NEB in *Enbridge*. Whether a regulatory tribunal's process can fulfill the Crown's duty to consult will depend on the tribunal's enabling statute and timely notice being given by the Crown to affected Indigenous groups. Whether its process is sufficient to fulfill the Crown's duty to consult in a particular case will depend on the scope of the project, the nature of the rights involved and the process undertaken by the tribunal.
[238] *Supra* note 177.
[239] *NL Accord Act*, *supra* note 130, s 46; *NS Accord Act*, *supra* note 130, s 46.
[240] R Fournier, "Marine Renewable Energy Legislation: A Consultative Process", Report to the Government of Nova Scotia, *Department of Oceanography and Marine Affairs Program, Dalhousie University* (July 2011) at 50–52, online: <www.oera.ca/wp-content/uploads/2013/05/Fournier-Final-Report.pdf>.

> attempting to move a project forward. For some, jurisdictional harmonization is considered to be an important goal of new regulatory legislation, ultimately leading to less ambiguity and delays, greater responsiveness, less duplication, improved clarity, and a much higher degree of predictability in the processes that fall under the rubric of regulation. Consequently, some feel that harmonization is the only possible course of action if Nova Scotians seriously wish to advance the [marine renewable energy] sector.

The proposed ocean resource boards will inevitably also have to coordinate with other agencies. To avoid, to the extent possible, any regulatory "morass" or "swamp" like that which project proponents describe encountering above, the boards should be required to work with other agencies and departments to reduce any unnecessarily duplicative processes and ensure harmonization of all regulatory requirements.

Finally, as part of a comprehensive regulatory regimes, the amendment of other applicable laws should be considered to address such diverse topics as appropriate liabilities for autonomous supply ships, data collection devices and remotely operated diving submarines, the pre-disposal treatment of ballast water and tighter regulations for near-shore stack emissions.

CONCLUSION

The aquaculture and ocean-based renewable energy industries differ significantly in maturity, business models, technologies, operations, and commercial and legal contexts. To that extent, their linkage at first appears anomalous. But closer inspection reveals remarkable congruity between their present circumstances. Both are poised for growth and offer tremendous opportunities for Atlantic Canada. Both are hobbled by the absence of any comprehensive regulatory regime. And both can best be developed through the joint federal-provincial framework based on the successful Atlantic Canadian offshore petroleum regime.

The differences between the renewable energy and aquaculture industries are, of course, substantial and must have a real impact on the ultimate form and content of their respective regulation. For instance, rather than creating a new ocean-based renewable energy regulatory from whole cloth, there may be merit in assigning such responsibility to the existing Petroleum Boards by amendment or annex to the Accord Acts; this, however, makes no sense for open-ocean aquaculture. The proposed regulatory regimes are thus necessarily skeletal and for the most part restricted to the framework, rather than the detail, of the regulation. Putting regulatory meat on the bones will be for government in close consultation with the respective industries, Indigenous peoples, other ocean users and the public. Their differences may also affect the priority accorded to establishing the regulatory regime for each industry. Ocean-based wind technologies and markets are much more mature than those of profitable commercial open-ocean aquaculture. Given the pressures of climate change and the more advanced state of the industry, there may be greater impetus to create a regime for ocean-based renewable energy.

Regulatory uncertainty is anathema to development anywhere, but especially where technological and environmental risks are already high. Entrepreneurs do take business risks, but are reluctant to take risks that are preventable; regulatory uncertainty is seen as entirely unnecessary and remediable. Without the security of an applicable legal regime, entrepreneurs will be unwilling to risk their time, effort, or the capital of investors who trust them.

By taking the initiative and starting with the base of existing offshore resource regulation, Nova Scotia or Newfoundland and Labrador can lead the development, with the federal government, of mirror legislation that can eliminate regulatory uncertainty for the new industries of far-ocean aquaculture and renewable energy. The optimum legislative approach will accommodate new and changing technologies with a goals-based, rather than a rules-based, focus. It will permit sensitive and flexible regulatory responses to emerging science and the solutions that science presents to make the development of these ocean resources safer, more environmentally sustainable, more efficient and more responsive to global needs.