

EU AND CANADA OFFSHORE RENEWABLE ENERGY POLICY AND GOVERNANCE: KEY SIMILARITIES AND DIFFERENCES

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Introduction

Offshore renewable energy resources are witnessing a new growth of interest from firms and governments across the globe. Legitimate concerns over the devastating effects of global warming, the depletion of conventional energy resources, the rising cost of electricity, and the over-dependence on foreign sources of energy have sparked renewed interest in offshore renewable energy sources both within the European Union (EU) and Canada. There is also a realization that offshore renewable energy like other renewable sources of energy produces some positive externalities such as fostering job creation and promoting improvements in health. There are other advantages of offshore renewable energy that further account for the recent increased interest in its exploitation by the EU and Canada. These include, the fact that offshore winds are stronger, steadier and free from obstruction, permitting greater and more efficient production of wind energy. Additionally, the vast ocean spaces have the capacity to accommodate significant numbers of turbines compared to land-based sites. Furthermore, locating wind turbines offshore will typically lead to fewer complaints that are associated with the perceived aesthetic impacts of wind turbines.¹ Ocean resources in the United Kingdom, Denmark, and Germany are but a few places within the EU that boast of massive potential of offshore renewable energy production. Being landlocked only along its southern border, much of Canada is surrounded by oceans, meaning it has access to a significant energy potential too. It is estimated that the realistic potential for power production in the Bay of Fundy in Atlantic Canada alone is in the region of 1.7 gigawatts (GW) of power, with a theoretical potential well in excess of 7 gigawatts.²

The EU is by far the global leader in offshore renewable energy resource development, with for example, over ninety percent of the world's total installed offshore wind capacity. In 2012, the 28 EU countries produced 106 GW of wind power while Canada represented two percent of global wind power with 6.2 GW of production.³ Canada is just beginning to harness its offshore renewable energy, although it is endowed with a sizeable amount of ocean energy resources. In spite of the differences, there is a firm belief by policy makers from the two jurisdictions that technology is no longer the major challenge for the offshore energy industry overall, but more difficult challenges remain and relate to finance, social and environmental factors and an overall rethinking of how to design, operate and govern offshore energy resources.

¹Aldo Chircop and Peter L'Esperance "Functional Interactions and Maritime Regulation: The Mutual Accommodation of Offshore Wind Farms and International Navigation and Shipping" (2016) 30 *Ocean Yearbook* 439

²See Meinhard Doelle "Offshore Renewable Energy Governance in Nova Scotia: A Case Study of Tidal Energy in the Bay of Fundy" (2015) 29 *Ocean Yearbook* 271.

³Catherine Boulatoff and Carol Marie Boyer "Performance, of Offshore Renewable Energy (ORE) Firms: An International Perspective" (2016) 30:1 *Ocean Yearbook* 417.

This report summarizes research papers related to a project on the EU and Canadian approaches to offshore renewable energy, which was sponsored by the European Union Centre of Excellence (EUCE) at Dalhousie University.⁴ The purpose of this report is to synthesize the findings of these research papers by examining the similarities and differences in the current governance systems for offshore renewable energy in the EU and Canada. The report will also examine potential learning opportunities that may contribute to the development of offshore renewable energy in both jurisdictions.

Overview of EU and Canadian Renewable Energy Policy Development

The EU and Canadian energy policy development started from the same traditional paradigm of a focus on carbon intensive energy sources. But more recently, the development of renewable energy policy by the two regimes has tended to follow different paths, with the EU regime largely influenced by its approach of tying its energy policy to climate change targets. This accounts for slight differences in the approaches to renewable energy generally, and to some degree, regulatory frameworks affecting the development of offshore renewable energy. Annie Cudennec, describes the early EU energy paradigm as being characterized by the dominance of carbon intensive energy sources, exemplified by the creation of European Coal and Steel Community in 1951.⁵ This was followed by the establishment of the European Atomic Energy Community (EURATOM) to create the conditions necessary for the development of a powerful nuclear industry which will provide extensive energy resources. Although the EU had no energy competence prior to 2009, all the steps it took relating to energy were not aimed at promoting the development of renewable energy generally or offshore renewables in particular. It was only in 2009, when the Lisbon Treaty (Article 4) created specific energy competence for the EU and required it to promote energy efficiency and the development of new and renewable forms of energy. This created the enabling conditions for ensuring the offtake of many offshore renewable energy projects across EU member states. Boulatoff and Boyer demonstrate how between 2003-2013, EU countries led by Denmark, the United Kingdom, Sweden, Belgium and the Netherlands generated more than half of the global total of offshore wind energy alone, largely attributable to the legal commitments to deliver energy from renewable resources as part of EU's commitment to reduce climate change.⁶

The Canadian energy policy environment, like the initial stages of EU energy development, had been traditionally underpinned by the development of fossil fuel based energy sources. There are varying energy options in Canada and the policy environment is as diverse as the country itself. For example, in British Columbia 86.3% of electricity comes from large

⁴Catherine Boulatoff and Carol Marie Boyer "Performance, of Offshore Renewable Energy (ORE) Firms: An International Perspective" (2016) 30:1 Ocean Yearbook 417; Meinhard Doelle "Offshore Renewable Energy Governance in Nova Scotia: A Case Study of Tidal Energy in the Bay of Fundy" (2015) 29 Ocean Yearbook 271; Annie Cudennec "The European Legal Framework for Marine Renewable Energies" (2016) 30:1 Ocean Yearbook 488; Aldo Chircop and Peter L'Esperance "Functional Interactions and Maritime Regulation: The Mutual Accommodation of Offshore Wind Farms and International Navigation and Shipping" (2016) 30 Ocean Yearbook 439; Sarah McDonald and David L. VanderZwaag "Renewable Ocean Energy and International Law and Policy Seascape: Global Currents, Regional Surges" (2015) 29 Ocean Yearbook 299, and Nicolas Boillet and Gaëlle Guéguen-Hallouët "A Comparative Approach of Offshore Renewable Energy Legal Frameworks between France and the United Kingdom" (2016) 30:1 Ocean Yearbook 377. Note that where necessary, we make reference to other sources on offshore renewable energy governance in the two regimes for the purposes of effective comparison and drawing of lessons.

⁵ Ibid, Cudennec.

⁶Boulatoff and Boyer, *supra* note 2.

renewable hydro resources while Nova Scotia's electricity mix is currently reliant on fossil fuels with only 18% coming from renewable sources as of 2012.⁷ While the potential for offshore renewable energy was recognized over three decades ago especially in Atlantic Canada, not much was done to shift policy to the exploitation of the vast offshore renewable energy resources. Meinhard Doelle, describes how previous attempts in the 1980s to develop offshore renewable energy in the Bay of Fundy, failed because of a combination of factors, including technical, economic and environmental concerns.⁸ Presently in Canada the environmental imperative for a switch from fossil fuel-based resources has become a pre-occupation of both the federal and provincial governments although, unlike the EU such efforts to advance renewable energy are not linked to climate change targets. But the increased interest to significantly reduce the environmental impacts of energy extraction has witnessed a rapid expansion of power capacity in recent years. For example, as of December 31, 2014, Canada had over 5,130 wind turbines operating on 225 wind farms for a total installed capacity of 9,694 megawatts, compared with only 60 wind turbines, 8 wind farms and 27 megawatts in 1998.⁹ Canada's marine renewable energy industry strategy roadmap outlines measures to aid the development of offshore renewable energy. It sets targets of 75MW by 2016, 250MW by 2020 and 2GW by 2030 for installed in-stream tidal, river-current and wave energy generation.¹⁰

EU renewable energy policy objectives are similar to those professed by the Canadian government. However, until recently, and with respect to only a few Provinces, the Canadian policy objectives are scattered in policy documents and government statements and not cast in legal instruments like the EU. Doelle, for example, outlines the policy aims for the increased efforts by the government of Canada to switch from largely carbon-based energy sources to offshore renewable energy. The reasons include the environmental imperative for a switch from traditional non-renewable fossil-based sources; the need to reduce greenhouse gas emitting energy sources; economic diversification with dwindling alternative resources and emergence of an energy intensive manufacturing industry as well as the need to ensure security of supply of energy to those industries and households that need it.¹¹ Similar, drivers of the growth of marine offshore renewable energy growth in Canada are expressed in a 2013 report by Marine Renewable Energy Canada.¹² While these may point to the energy policy aims of Canada, there is still no comprehensive policy instrument that outlines these goals, at least at the federal level. The federal government is still developing a set of federal policy options and recommendations for administering marine renewable energy in the federal offshore.¹³ In spite of the lack of a comprehensive federal policy that spells out objectives relating to offshore renewable energy, some Provinces are taking the lead in developing regulatory guidance that among other things, enumerates some policy aims for the exploitation of offshore renewable energy. Nova Scotia's interest in offshore renewable energy and its recent enactment of a marine renewable energy legislation is largely influenced by a mix of factors such as the

⁷Marine Renewables Canada "Marine Renewable Energy in Canada" Online< <http://www.marinerenewables.ca/marine-renewable-energy-in-canada/marine-renewable-energy-in-canada-overview/>>

⁸ Doelle, supra note 1.

⁹ See Natural Resource Canada "About Renewable Energy" Online< <http://www.nrcan.gc.ca/energy/renewable-electricity/7295#ocean>>.

¹⁰Supra note 6.

¹¹ Doelle, supra note 1,

¹²supra note 6.

¹³ Ibid.

economic benefit, energy security/diversity goals and environmental benefits of clean energy.¹⁴

In contrast, the EU energy policy goals are largely derived from Article 4 of the Treaty of Lisbon. These include: (i) securing EU energy security through the deployment and development of renewable energy - because the EU consumes about 20% of the world's energy and imports more than half of its energy requirements; (ii) preserving the environment – through the development of renewable energy as an important part of the EU's international commitment to reducing greenhouse gas emissions and the preservation of the environment and climate concerns generally; and (iii) developing renewable energy capacity which serves to stimulate European growth and create employment.¹⁵ It is estimated that renewable energy has the capacity to create 5.4million jobs and gross added value of about €500 billion per annum in the EU. In 2011, offshore wind alone created 35,000 jobs. Offshore wind could meet 4% of EU energy demand by 2020 and 14% by 2030. This would mean 170,000 jobs by 2020, increasing to 300,000 by 2030.¹⁶

General Regulatory and Legal Framework

Offshore renewable energy development requires a stable and consistent legal regime that spells out the rules for licensing, regulation and pathways for commercial exploitation. Both Canada and EU have complex multilevel governance systems – where authority is dispersed between governments and this may account for differences on how they regulate the exploitation of offshore renewable energy. However, the EU and Canada are signatories to a range of international agreements such as the United Nations Law of the Sea Convention, the Convention on Biological Diversity, the International Whaling Convention, the Climate Agreement, to mention but a few, that provide overall governance framework for offshore renewable energy development by establishing rights and responsibilities.¹⁷ In spite these common treaty commitments, differences may still arise because the language of treaty obligations are expressed in broad terms, allowing signatories to flesh out the details of implementation and sometimes interpretation. Also differences in domestic institutional and political goals may also have an impact on how the broad commitments are implemented.

In Canada there are multiple federal, provincial, and potentially municipal authorities involved in marine renewable energy development, regulation and policy. Jurisdiction over offshore renewable energy resources between federal and provincial governments can therefore be complex. Meinhard Doelle discusses how there is shared jurisdiction between the federal and provincial governments on the regulation of energy generally and offshore renewable energy in particular.¹⁸ In this shared competence to regulate offshore renewable energy, Canada has had to largely apply existing laws, where necessary, to regulate offshore renewable energy. The federal legal regulatory framework encompasses laws such as *Fisheries Act* (which regulates impacts on fish habitat resulting from offshore renewable energy construction, operation and decommissioning); the *Canadian Environmental Assessment Act* (which provides standard requirements for environmental assessment); *The Species At Risk Act* (which

¹⁴ See William Lahey “Regulation and Development of a New Energy Industry: Tidal Energy in Nova Scotia” (2015) 3:3 Energy Regulation Quarterly Online< <http://www.energyregulationquarterly.ca/articles/regulation-and-development-of-a-new-energy-industry-tidal-energy-in-nova-scotia#sthash.91sMuoei.dpbs>>

¹⁵ Supra note 3

¹⁶ *ibid*

¹⁷ McDonald and VanderZwaag, supra note 4.

¹⁸ Supra note 1.

protects listed species on federal land); *The Navigation Protection Act* (which regulates navigable waters); the *Oceans Act*; and the *National Energy Board Act*. There are several other laws and regulations that indirectly may be applicable to governing the exploitation and deployment of offshore renewable energy at the federal level in Canada. Whatever, the laws at the federal and provincial level, the Government of Canada and various provincial governments, have made commitments to develop new policies and legislation specific to the development of marine renewable energy, covering issues such as: seabed leasing, licensing for extraction of the resource, environmental effects and impacts, social impacts and benefits, management of competing uses and multiple users/uses, and industry growth and sustainability.¹⁹ The province of Nova Scotia just recently enacted the Marine Renewable Energy Act, which makes it the first province to have a distinct comprehensive legal framework for offshore renewable energy. The Government of British Columbia has also developed a regulatory process for offshore renewable energy projects. British Columbia released a leasing policy for marine renewable energy projects in 2011, the *Land Use Operational Policy for Ocean Energy Projects*²⁰, which has undergone several amendments. The other provincial governments are also undertaking reviews of their existing regulatory frameworks to accommodate offshore renewable energy.

The EU legal framework for governing offshore renewable energy like Canada is framed at a broad level. Member countries, are however, free to interpret these broad commitments in designing domestic rules for governing their energy sectors including offshore renewable energy. Just like the varied provincial frameworks for governing offshore renewable energy in Canada, the EU Member states have scope to adopt different regulatory frameworks for managing offshore renewable energy so long as the broad goals of achieving common climate targets are realized. A special feature of the EU renewable energy targets is that they are legally binding. The process to the current binding obligations has been progressive. In 2001 the EU adopted Directive 2001/77/EC, meant to promote electricity produced from renewable sources. This directive required Member States to set national indicative targets for future electricity consumption produced from renewable energy sources.²¹ In 2009 - Directive 2001/77/EC was amended and repealed with the adoption of the Climate and Energy package. The Energy Package adopted six texts aimed at reducing greenhouse gas emissions by 2020. One of the main texts adopted was Directive 2009/28/EC on the promotion of the use of energy from renewable sources. The text sets “mandatory national targets for the overall share of energy from renewable sources in gross final consumption of energy and for the share of energy from renewable sources in transport”. The Climate and Energy Package embodies the EU growth strategy for 2020 and requires: 20% of share of energy from renewable sources by 2020 (Directive 2009/28/EC); 20% improvement in energy efficiency by 2020 (Directive 2012/27/EU); and reduction of greenhouse emissions exceeding 20% compared to 1990 levels (Directive 2009/29/EU). Directive 2009/72/EC makes these commitments bindings. These commitments were updated with the 2030 Framework for Climate and Energy Package which is more extensive than the previous package. The 2030 Framework for Climate and Energy Policy Framework establishes new targets: (a) a binding EU target of 40% reduction in greenhouse gas emissions by 2030 compared to 1990 levels; (b) at least 27% of renewable energy consumed within the EU by 2030; (c) at least 27% improvement in energy efficiency by 2030.²² Various countries within the EU are developing new policies and laws to advance

¹⁹Supra note 6.

²⁰See British Columbia <http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/ocean_energy.pdf>

²¹ Cudennec, supra note 3.

²² Ibid

offshore renewable energy and meet the EU targets. The United Kingdom for example, is a leader both within the EU and globally in terms of having a robust legal framework specifically designed to promote offshore renewable energy and solidify its position as a global leader.

Another key difference between the EU governance framework and the Canadian practice is the level of coordination among decentralized governance structures to promote the deployment of renewable energy. While the EU through various legal mechanisms has succeeded in reaching a very high level of coordination among state parties on renewable policy and implementation, Canada's approach is still very disparate with provincial governments hardly coordinating their policy and activities with each other. Through EC Directive 2009/28/EC there is a requirement from the National Renewable Energy Action Plan for enhanced coordination among member states through flexible mechanisms that promote inter-state efforts to advance the deployment of renewable energy. Some of these mechanisms include: (a) Statistical transfers – where states can mutually agree to statistically transfer their excess produced renewable energy to another member state, enabling members in need of more renewable energy to mutually benefit from the exchange; (b) joint projects – two or more member states can cooperate to finance and implement a renewable energy project thereby sharing costs and benefits; and (c) joint support schemes – states can coordinate their national support schemes for renewable energy generation to enable them jointly move closer to the realization of their individual renewable energy targets in a cost effective manner. Such coordination mechanisms within Canada are either non-existent or weak. There is no national coordination plan between the provinces on how to cooperate and leverage their respective comparative advantages to achieve the goals of promoting the development of offshore renewable energy.

Funding Support and Incentives

There are a variety of government support mechanisms that support offshore renewable energy in Canada at both the federal and provincial levels of government. These support mechanisms are mainly aimed at programs that advance renewables energy development, sustainability and research and development into clean energy. There has been a recent trend towards dedicating a good part of the funding to offshore renewable energy. As at 2013, projects with an offshore renewable energy focus received approximately \$25 million through the Clean Energy Fund which included support for the establishment of Fundy Ocean Research Center for Energy (FORCE).²³ It is further estimated that the Sustainable Development Technology Canada (SDTC) has also invested in marine renewable energy in the region of \$25million between 2004-2013 to support various projects. Furthermore, the government of Canada through Canada's ecoEnergy Innovation Initiative (ecoEII) launched a \$97million to support research, development and demonstration and some part of that fund has been allocated to marine renewable energy research and development projects. The Scientific Research and Experimental Development (SR&ED) Program is also a federal tax incentive program which can also cover offshore renewable energy depending on the activity. The SR&ED provides claimants cash refunds and/or tax credits for expenditures on eligible research and development work done in Canada.²⁴ At the provincial government level, a few support schemes are being implemented to support offshore renewable energy by governments in British Columbia, Nova Scotia and Ontario. For example, British Columbia established the Innovative Clean Energy (ICE) Fund in 2007 to encourage development of new sources of clean energy and technologies

²³Supra note 6.

²⁴ Ibid

and included tidal and wave energy. Under the ICE Fund there were two calls for funding, resulting in contributions of about \$6.5 million for marine renewable energy.²⁵ The Electricity Act of Nova Scotia authorizes regulations regarding renewable energy with provisions on community feed-in-tariffs (COMFIT) and developmental tidal array tariffs.²⁶

The main EU government incentives for renewable energy generally and offshore renewable energy in particular are a combination of EU funding schemes and framework conditions for national support schemes. As noted by Cudennec, renewable energy is supported under the Horizon 2020 Program with nearly €80 billion of funding over seven years (2014-2020). Horizon 2020 is devoted to secure, clean and efficient energy. The main aim of Horizon 2020 Program is to reduce energy consumption, carbon emissions, give priority to low carbon energy sources and develop relevant knowledge and technologies. For ocean energy, this program stresses the importance of developing emerging designs and components to ensure efficient and effective long-term cost reduction and to achieve high levels of reliability and survivability for at least 20 years in harsh conditions. Another EU funding scheme is the NER 300 - a funding program for innovative low-carbon energy projects. NER 300 is funded from the sale of 300 million emission allowances from the New Entrants' Reserve (NER) introduced for the third phase of the EU emissions trading system (EU ETS). The purpose of NER 300 is to develop safe carbon capture and storage (CCS) and innovative renewable energy (RES) technologies on a commercial scale within the European Union. To achieve this objective, NER 300 also seeks to leverage private investment and national co-funding across the EU. Several projects concerning ocean energy and offshore wind power have been funded in France, Ireland, Portugal and Spain under the NER 300 second call for proposals in 2014. Under the framework conditions for national support measures the EU through Directive 2009/28/EC, may also authorize member states to support marine renewable energy. According to the Directive, a support scheme includes renewable energy obligation support schemes, including those using green certificates, and direct price support schemes including feed-in tariffs and premium payments. Cudennec observes that due to the high cost of the exploitation of marine renewable energies, support schemes are essential to the development of this industry. The UK government in 2012 launched the UK Green Investment Bank, one of several government-backed green investment banks devoted to investing in clean technology infrastructure and this has enabled the UK to entrench itself as the leader in offshore wind energy market.²⁷ Another UK financial mechanism that supports renewable energy is the renewable obligation (RO) scheme which is a revenue enhancing mechanism providing a subsidy for renewable electricity sales implemented through a green certificate trading scheme known as the Renewable Obligation Certificate. In France, the government supports renewable energy through guaranteed repurchase prices paid by electricity consumers to cover expenses associated with public service missions and competitive tendering for target quantities of green electricity set by public authorities.²⁸

It appears from the above that while the two regimes have initiatives to incentivize offshore renewable energy at both the supra-national and sub-national levels of government, the EU has a more comprehensive system of funding in place than that of Canada. In terms, of per dollar support to the offshore renewable energy industry, the EU support mechanisms dwarf the support given by both the Canadian federal government and its provinces.

²⁵ *ibid*

²⁶ Doelle, *supra* note 1.

²⁷ Boulatoff and Boyer, *supra* note 2.

²⁸ Ian Bailey et al "Comparison of national Policy Frameworks for Marine Renewable Energy within the United Kingdom and France" (2012) *Marine Energy in Far Peripheral and Island Communities* 1.

Environmental Implications of Offshore Renewable Energy Exploitation

Harnessing offshore renewable energy has impacts on the marine environment and other water-related activities and even where there is no direct impact, there are issues of competition for space.²⁹ There are uncertainties regarding how the presence of multiple devices and users of the ocean will impact the environment.³⁰ Aldo Chircop and Peter L'Esperance recount how the EU in recent times has introduced marine spatial planning as a required practice in Member States to deal with the potential impacts of offshore renewable energy exploitation. The main goal of marine spatial planning is to harmonize all activities at sea. It emphasizes that Member States are responsible for elaborating their own maritime spatial planning in accordance with the EU framework. When establishing their spatial plans, Member States must take into consideration activities and uses, including installations and infrastructures for the production of energy from renewable sources.³¹

The Canadian government has only recently begun supporting research aimed at developing a model that identifies the potential stressors and environmental impacts associated with offshore renewable energy.³² In Nova Scotia, the government has aimed to reduce the risk around environmental uncertainties posed by tidal energy development by conducting strategic environmental assessments (SEA) in regions before development can commence.³³ SEAs are systematic decision support processes, aiming to ensure that environmental and possibly other sustainability aspects are considered effectively in policy, planning and program making.³⁴ There are also provincial and federal environmental regulatory processes that serve to identify and mitigate potential impacts of devices on the marine environment. But unlike the EU that has introduced a common environmental policy framework for all member states, Canada's approach still largely depends on the utilization of pre-existing environmental laws at the federal and provincial level that in some cases, are not suitable for the unique character of the offshore renewable energy industry.

Opportunities for Learning

The comparison of the regimes for regulating offshore renewable energy in Canada and the EU shows that there are several opportunities for learning. It is evident that Canada has the interest in establishing a solid foundation for offshore renewable energy as one of the major energy sources, but its steps are still slower than that of the EU. But there is no doubt that Canada has many advantages that support the growth of offshore renewable energy. The Bay of Fundy alone has the potential of making Canada one of the leaders of offshore renewable energy if the necessary investment is deployed to support technology infrastructure and research and

²⁹Aldo Chircop and Peter L'Esperance "Functional Interactions and Maritime Regulation: The Mutual Accommodation of Offshore Wind Farms and International Navigation and Shipping" (2016) 30 *Ocean Yearbook* 439

³⁰ *Ibid*

³¹ Cudennec, *supra* note 3.

³² *Supra* note 6.

³³ Doelle, *supra* note 1.

³⁴ *ibid*

development.

The EU's coordinated system of fostering renewable energy deployment that allows member countries to cooperate in their efforts to meet renewable energy targets, offers opportunities for learning to Canadian provinces. It is a fact that some provinces have a comparative advantage in offshore renewable energy resources, because of their proximity to the Ocean. However, such provinces may still need resources and technology to exploit the energy resources of the ocean which non-ocean-rich provinces may be able to assist. Cooperating to establish joint offshore renewable energy projects by sharing costs and benefits is a great way to leverage the potential that Canada has in marine energy. The highly disparate provincial regulation of renewable energy in Canada is a challenge that Canada can look to the EU for solutions by adopting the EU model of intra-European cooperation. The federal government may need to assume a leadership role by establishing the necessary framework for provincial coordination on offshore renewable energy development.

The development of energy policy and regulatory framework also offers opportunities for cross-border learning. The gradual development of EU energy policy that eventually resulted in legally binding targets expressed in various EU directives may be an experience that the Canadian federal government may consider seriously in its roadmap for offshore renewable energy development. As pointed out earlier, the Canadian renewable energy policy and legal rules are scattered in policy documents and government statements without a comprehensive national framework for the advancement of offshore renewable energy. While the challenges regarding complexity of the regulatory system is a shared challenge by both the EU and Canada, the issues regarding regulatory competence under the EU regime appear to be more clearly defined than Canada's. But the different political context in the EU and Canada mean that such a comprehensive policy framework in Canada may face different issues of implementation. But harmonizing legislation, policies and regulations would provide common goals and principles for the provinces while allowing some discretion on how to implement the framework. The principle of flexibility is one great thing the Canadian framework may take away from the EU regime. The EU mechanism although comprehensive, allows for the various member states to flexibly implement such policy goals and targets. Furthermore, in terms of establishing legal tools solely dedicated to promoting offshore renewable energy, the EU system may also have some lessons to take from the Canadian province of Nova Scotia which recently enacted a Marine Renewable Energy legislation to advance offshore renewable energy industry. The EU directives and binding requirements are conceived at the broad and general level of promoting energy efficiency and new and renewable energy but not specifically dedicated to offshore renewable energy. The Nova Scotia legislation is an example that can be adopted to suit the special needs of energy from ocean resources.

One other area that needs attention is how to handle the effects of offshore renewable energy exploitation on the environment. While the EU has adopted marine spatial planning as a required practice within all its Member countries, strategic environmental assessment has been recently adopted only in the province of Nova Scotia. The goal of strategic environmental assessment which is the filling of knowledge gaps in terms of social and environmental impacts of offshore renewable energy exploitation is worth adopting as a national standard. Canada's federal government may learn from the EU by making the process of strategic environmental assessment being implemented in Nova Scotia a requirement across the country for offshore renewable energy projects.

Finally, a potential area for learning is the the quantum of funding and incentives made

available by the EU and its member states to advance renewable energy innovation. Compared with Canada's approach, it is evident that Canada still has a long way to go in providing the necessary investment for renewable energy uptake. In addition to policy and legal support, funding and financing is key to the rapid deployment of offshore renewable energy resources. The federal and provincial governments in Canada can take lessons from the EU's aggressive support and incentive schemes to create an attractive investment climate for offshore renewable energy. There are efforts that the Canadian government is taking but they are still baby steps and may not be sufficient to catapult the country towards the pathway of long term commercialization.

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