

Offshore Wind Energy in Canada: Charting an Ecologically Sustainable Future from International Law and Policy Coordinates and State Practices

by

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DEDICATION

I dedicate this thesis to my beloved family, whose unwavering support has been the foundation of my academic journey. To my wife, Nasrin, for her constant love, patience, and understanding through the many years of this endeavor. Your encouragement and belief in me have been my greatest strength. To my daughter, Selena, for bringing joy and meaning to my life.

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ABSTRACT: This thesis addresses an important conundrum: Despite the environmental benefits of reducing greenhouse gas (GHG) emissions, offshore wind energy (OWE) may engender adverse environmental impacts and affect marine users such as shipping and fisheries. In other words, while OWE helps Canada by contributing to meeting climate change mitigation goals under the Paris Agreement, it may undermine conservation goals of halting and reversing biodiversity loss under the Convention on Biodiversity. OWE may cause adverse effects on ecosystems, including loss of fish and fish habitats due to the construction of OWE and mortality of birds and bats due to collision with OWE turbines. Using ecological sustainability as a theoretical framework for policy and regulatory design, this thesis examines how Canada should strengthen its regulatory framework governing OWE to ensure that the environmental objectives of restoring or sustaining biodiversity are not compromised in the name of reducing GHG emissions. Based on ecological sustainability and informed by lessons learned from international law and comparative law (specifically the experiences of the United Kingdom, Germany, and Denmark), the thesis argues that Canada should: (i) Expand ecological sustainability in the law to preserve ecological integrity; (ii) Employ an integrated management approach through a legally binding marine spatial planning to reduce conflicts of OWE with the environment and marine users; and (iii) Utilize strategic environmental assessments and environmental impact assessments to avoid and/or mitigate the adverse effects of OWE. The thesis also provides a detailed analysis of key federal and provincial laws and policies, utilizing Nova Scotia as an illustrative provincial case. It offers specific proposals to improve these laws and policies to foster an ecologically sustainable future for the regulatory framework of OWE in Canada. Specifically, the thesis makes recommendations for strengthening various Acts, including an Act to amend the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to make consequential amendments to other Acts, the Oceans Act and its related policies, the Fisheries Act, the Species at Risk Act, and Migratory Birds Convention Act.

LIST OF ABBREVIATIONS

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area
AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
CBD	Convention on Biological Diversity
BSH	[Germany's] Federal Maritime and Hydrographic Agency
CMS	Convention on Migratory Species of Wild Animals
COLREG	Convention on the International Regulations for Preventing Collisions at Sea
DFO	Department of Fisheries and Oceans Canada
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESSIM	Eastern Scotian Shelf Integrated Management
EU	European Union
EUROBATS	Agreement on the Conservation of Populations of European Bats
IEA	International Energy Agency
IMO	International Maritime Organization
IRENA	International Renewable Energy Agency
ITLOS	International Tribunal for Law of the Sea
IWC	International Whaling Commission
MARPOL	International Convention for the Prevention of Pollution from Ships
MMO	[The UK] Marine Management Organization
MOU	Memorandum of Understanding
MPS	[The UK] Marine Policy Statement

MSP	Marine Spatial Planning
NDCs	Nationally Determined Contributions
NEB	National Energy Board
OECD	Organization for Economic Co-operation and Development
OWE	Offshore Wind Energy
POGG	Peace, Order, and Good Government
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
TFEU	Treaty on the Functioning of the European Union
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UK	United Kingdom
UNCLOS	United Nations Convention on the Law of the Sea
URN	Underwater Radiated Noise
US	United States

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CHAPTER ONE- INTRODUCTION

The premise of this thesis is that achieving climate change goals through the development of Offshore Wind Energy (OWE)¹ must not compromise ecological integrity. Canada's climate change goal for 2030 is to reduce emissions by 40-45% below 2005 levels by 2030.² OWE is a clean technology that can contribute to meeting this target in the energy sector. This contribution is also vital in the energy sector, which accounts for three-quarters of the world's greenhouse gas (GHG) emissions.³ The employment of renewable energy is important as the current global proposed mitigation targets will not cut GHG emissions to the extent required to meet the 2015 Paris Agreement temperature goals.⁴ According to an analysis by the International Renewable Energy Agency (IRENA), renewable energy will be a major contributor to achieving desirable results under the 1.5°C scenario by 2050.⁵ As a result of various drivers including mitigation efforts, the global capacity of OWE has reached 72 gigawatts from 2009 until 2023⁶ and it is expected that it will increase nearly ten-fold or 228 gigawatts by 2030 and 1000 gigawatts by 2050

¹ OWE is a type of energy that is generated by kinetic energy in the wind that rotates the turbine blades, with the energy then converted to electrical energy. The generated electricity is transmitted through seafloor cables to an onshore power station which is connected to a grid.

² Government of Canada, 'Canada's Climate Plans and Targets' <<https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview.html>> accessed 27 November 2024.

³ IEA, 'Data Explorer – Greenhouse Gas Emissions from Energy: Overview – Analysis - IEA' <<https://www.iea.org/reports/greenhouse-gas-emissions-from-energy-overview/data-explorer>> accessed 23 July 2022.

⁴ UNEP, 'Emissions Gap Report 2021' <<https://www.unep.org/resources/emissions-gap-report-2021>> accessed 23 July 2022.

⁵ IRENA, 'World Energy Transitions Outlook: 1.5°C Pathway' (2021) 23 <<https://irena.org/publications/2021/Jun/World-Energy-Transitions-Outlook>> accessed 9 July 2022.

⁶ 'Global Offshore Wind Energy Capacity 2023' (*Statista*) <<https://www.statista.com/statistics/476327/global-capacity-of-offshore-wind-energy/>> accessed 16 December 2024.

globally.⁷ For example, the UK aims to develop at least 50 gigawatts of offshore wind capacity by 2030 as part of its climate actions.⁸

However, the development of OWE may have adverse impacts on ecosystem components and ecological goals. Chapter two of this thesis will cover in detail the potential negative impacts, which include changes in the structure, process, and functioning of ecosystems. Canada's 2030 Nature Strategy aims to halt and reverse biodiversity loss in Canada to achieve the goals and targets of the Kunming-Montreal Global Biodiversity Framework.⁹ One of the main goals of this Nature Strategy is to protect 30% of Canada's land and waters by 2030 as protecting ecosystems is key to reversing biodiversity loss and preventing further loss.¹⁰

This potential tension between climate change targets and ecological targets raises an important question of how laws and policies should regulate OWE to ensure the preservation of ecological integrity and promote an ecologically sustainable future for OWE in Canada.

To address this question, the introductory chapter of this thesis begins by reviewing several key aspects of OWE. It highlights the advantages of OWE and considers the potential adverse environmental impacts of developing OWE. The introduction also

⁷ IRENA, 'Future of Wind: Deployment, Investment, Technology, Grid Integration and Socio-Economic Aspects (A Global Energy Transformation Paper)' (2019) 10 <<https://www.irena.org/publications/2019/Oct/Future-of-wind>> accessed 11 July 2022.

⁸ 'Progress towards Reaching Net Zero in the UK' (*Climate Change Committee*) <<https://www.theccc.org.uk/climate-action/uk-action-on-climate-change/progress-snapshot/>> accessed 27 November 2024.

⁹ Environment and Climate Change Canada, 'Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada' (2024) guidance - legislative 2 <https://publications.gc.ca/collections/collection_2024/eccc/en4/En4-539-1-2024-eng.pdf> accessed 15 November 2024.

¹⁰ *ibid* 22.

examines the role of law in addressing these environmental impacts and introduces the research question, followed by reviewing the current literature on the topic. Finally, this chapter elaborates on the research methodologies employed in this thesis, including doctrinal methodology, comparative law, and ecological sustainability.

1.1 The Advantages of Offshore Wind Energy

OWE is an option to achieve climate objectives because it provides a clean and renewable source of electricity that does not produce GHG emissions.¹¹ By replacing fossil fuels, which are a major source of carbon emissions, OWE contributes significantly to reducing the global carbon footprint.¹² It is a sustainable resource, relying on the natural and inexhaustible power of wind, which aligns with long-term environmental and energy goals.

OWE also has other benefits. Offshore wind farms can be developed relatively quickly, allowing for rapid expansion to meet short- and medium-term climate targets.¹³ Furthermore, the economic benefits of OWE can be substantial.¹⁴ OWE creates jobs in manufacturing, installation, and maintenance. It can also enhance energy security by reducing dependence on imported fuels and diversifying energy sources.¹⁵

¹¹ Chong Wei Zheng and others, 'An Overview of Global Ocean Wind Energy Resource Evaluations' (2016) 53 *Renewable and Sustainable Energy Reviews* 1240.

¹² Christopher Jung, Leon Sander and Dirk Schindler, 'Future Global Offshore Wind Energy under Climate Change and Advanced Wind Turbine Technology' (2024) 321 *Energy Conversion and Management* 119075.

¹³ Dongran Song and others, 'Advances in Offshore Wind' (2024) 12 *Journal of Marine Science and Engineering* 359.

¹⁴ Kevin Connolly, 'The Regional Economic Impacts of Offshore Wind Energy Developments in Scotland' (2020) 160 *Renewable Energy* 148.

¹⁵ Scott Victor Valentine, 'Emerging Symbiosis: Renewable Energy and Energy Security' (2011) 15 *Renewable and Sustainable Energy Reviews* 4572.

OWE plays a particularly important role in the global energy transition. Offshore wind farms have been growing globally to generate electricity. As of 2024, the world's largest installed and operational wind farm is Hornsea 2. It is a 1.3 gigawatts offshore wind farm, which has 165 wind turbines, located 89km off the Yorkshire Coast, and can help power over 1.4 million homes in the United Kingdom (UK).¹⁶ Commercial wind turbines are usually located in waters with a maximum depth of 30 meters in areas close to land because they must be fixed to the seabed and be cost-efficient in terms of underwater cabling up to the onshore grid.¹⁷ Floating turbines, which can be placed farther out to sea in waters deeper than 60 meters, are slowly being developed and have been tested and operated successfully in Hywind, Scotland.¹⁸

OWE has advantages when compared with onshore wind energy. The offshore wind has a higher quality than onshore wind as the speed is higher, making it more efficient.¹⁹ Offshore wind is also more consistent and uniform than onshore wind, which leads to higher production of energy per installed unit (known as a higher capacity factor).²⁰ The onshore locations, where wind speeds are high, are remote from the grid connections, causing transmission challenges, and requiring the development of a grid system.²¹ In addition, offshore wind turbines installed far away from coastlines tend to cause less

¹⁶ 'Hornsea 2, the World's Largest Windfarm, Enters Full Operation' <<https://orsted.com/en/media/newsroom/news/2022/08/20220831559011>> accessed 28 October 2024.

¹⁷ Dennis YC Leung and Yuan Yang, 'Wind Energy Development and Its Environmental Impact: A Review' (2012) 16 *Renewable and Sustainable Energy Reviews* 1036.

¹⁸ 'Floating Offshore Wind in Equinor' <<https://www.equinor.com/en/what-we-do/floating-wind.html>> accessed 10 April 2021.

¹⁹ M Dolores Esteban and others, 'Why Offshore Wind Energy?' (2011) 36 *Renewable Energy* 444, 445.

²⁰ *ibid.*

²¹ Joel B Eisen, *Advanced Introduction to Law and Renewable Energy* (Edward Elgar Publishing, Inc 2021) 25.

opposition from the public²² as they do not have any visual impact, which is common in onshore wind turbines.²³ Offshore wind also has no natural barriers such as mountains and it has the potential for utility-scale wind close to densely populated coastal areas.²⁴

OWE is expected to be developed in Canada through co-location with hydrogen. The primary studies show that OWE can be co-located with other types of technologies. For example, OWE can be co-located with hydrogen production to manage overall production and meet an increase in demand.²⁵ This co-location has been implemented in the UK, Belgium, the Netherlands, and Denmark.²⁶ The energy produced out of OWE can be stored up to a certain amount and for a short period, avoiding waste of energy. However, when energy production out of OWE has an excess, energy generators are asked to curtail generated electricity due to a lack of storage capacity and inefficiency and the inability of batteries to store energy for a long period and seasonal demands. Co-location of OWE with hydrogen technology offers the possibility to convert extra energy to hydrogen, which can be converted back into electricity when needed (Figure 1).²⁷

²² It is known as not in my backyard (NIMBY) phenomenon.

²³ Esteban and others (n 19) 448; ‘Onshore NIMBYism Ensures Offshore Wind’ <<https://www.forbes.com/sites/jeffmcMahon/2018/05/10/onshore-nimbyism-makes-offshore-wind-inevitable/?sh=5b6063097384>> accessed 29 October 2022.

²⁴ Eisen (n 21) 26.

²⁵ CanMet ENERGY, ‘Offshore Wind Technology Scan: A Review of Offshore Wind Technologies and Considerations in the Context of Atlantic Canada’ (2021) 25 <https://ftp.maps.canada.ca/pub/nrcan_rncan/publications/STPublications_PublicationsST/329/329349/gid_329349.pdf> accessed 30 October 2022.

²⁶ *ibid* 26.

²⁷ Office of Energy Efficiency & Renewable Energy - the United States Department of Energy, ‘How Wind Energy Can Help Clean Hydrogen Contribute to a Zero-Carbon Future | Department of Energy’ <<https://www.energy.gov/eere/articles/how-wind-energy-can-help-clean-hydrogen-contribute-zero-carbon-future>> accessed 31 October 2022.

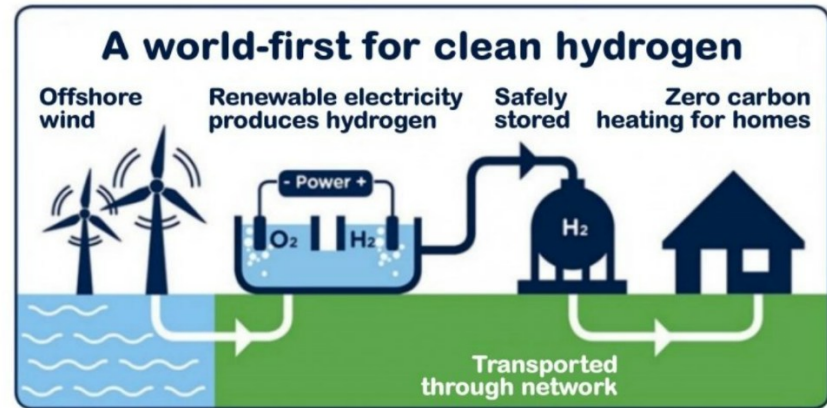


Figure 1- Conversion process of generated electricity

Currently, most of the hydrogen produced worldwide is from coal and natural gas and only 2% of global hydrogen is through electrolysis or surplus electricity from variable renewables.²⁸ The general comparison based on the emission at the production point indicates that green hydrogen can reduce carbon emissions and curb climate change.²⁹

In addition, hydrogen is regarded as a key player in Canada’s energy plan, energy export to other countries, and a pathway to net-zero emissions. Canada shaped its strategy for hydrogen in December 2020³⁰ and reached a memorandum of understanding with Germany in March 2021 to cooperate in various areas of the energy sector, among others, the energy transition to low-carbon fuels, increasing the share of renewable energy in

²⁸ IEA, ‘The Future of Hydrogen: Seizing Today’s Opportunities’ (2019) 37 <https://iea.blob.core.windows.net/assets/9e3a3493-b9a6-4b7d-b499-7ca48e357561/The_Future_of_Hydrogen.pdf> accessed 5 December 2022.

²⁹ It is beyond the scope of this thesis, but it should be noted that green hydrogen might have various environmental impacts. For instance, hydrogen consists of small molecules and very small leaks are common. It can easily pass through materials during production, storage, transmission, and distribution systems. The risk to the climate system could be significant in the future if green hydrogen technology becomes a major contributor to energy production and this leakage issue is not addressed through technological advancement.

³⁰ The Government of Canada, ‘Hydrogen Strategy for Canada: Seizing the Opportunities for Hydrogen-A Call to Action’ (2020) <https://natural-resources.canada.ca/sites/nrcan/files/environment/hydrogen/NRCan_Hydrogen%20Strategy%20for%20Canada%20Dec%2015%202200%20clean_low_accessible.pdf> accessed 8 October 2023.

transport, heating and industry and collaboration on clean hydrogen production and trade.³¹ The parties further declared their intention to establish Canada-Germany Alliance in August 2022 to cooperate in developing the hydrogen market, in particular from renewable energy, through supply chains.³² Creating the transatlantic supply chain for hydrogen is intended to be before 2030 with first deliveries by 2025.³³ Aiming at this bilateral trade and the development of the hydrogen industry, the parties committed to establishing the Canada-Germany Hydrogen Alliance.³⁴ The implementation of this trade is, however, within provinces and territories' jurisdictions and largely depends on their environmental and economic objectives and the identification of their opportunities and interests.³⁵

The province of Nova Scotia has also set an ambitious target to offer leases for five gigawatts of OWE by 2030, with the first call for bids in 2025, to support the hydrogen industry.³⁶ The government of Nova Scotia approved the initial phases of two proposed green hydrogen projects for Point Tupper³⁷ in Richmond County, Nova Scotia. One of the proposed projects is from EverWind Fuels Co. and the other one is from Bear Head Energy,

³¹ 'Memorandum of Understanding Between the Department of Natural Resources of Canada and the Federal Ministry for Economic Affairs and Energy of the Federal Republic of Germany on the Establishment of an Energy Partnership' 2 (IV) <<https://natural-resources.canada.ca/energy/resources/international-energy-cooperation/memorandum-understanding-between-the-department-natural-resources-canada-and-the-fede/23423>> accessed 8 October 2023.

³² 'Joint Declaration of Intent between the Government of Canada and the Government of the Federal Republic of Germany on Establishing a Canada-Germany Hydrogen Alliance' <<https://natural-resources.canada.ca/climate-change-adapting-impacts-and-reducing-emissions/canadas-green-future/the-hydrogen-strategy/joint-declaration-intent-between-the-government-canada-and-the-government-the-federal/24607>> accessed 9 October 2023.

³³ *ibid* paras 1(a) & 2(a)(i).

³⁴ *ibid* para 1(b).

³⁵ *ibid* para 1(c)(i) & (ii).

³⁶ Government of Nova Scotia, Canada, 'Province Sets Offshore Wind Target' <<https://novascotia.ca/news/release/?id=20220920003>> accessed 1 November 2022.

³⁷ Point Tupper is geographically located near Port Hawkesbury, which is on the southwestern end of Cape Breton Island, on the north shore of the Strait of Canso, Inverness County, and is the second largest port by tonnage annually in Canada.

which changes its original plan of LNG plant to a hydrogen production and export plan.³⁸ Both projects have proposed the same process for producing hydrogen, which aims to take water from Landrie Lake, split it into oxygen and hydrogen, and convert it into ammonium fertilizer to be shipped to Germany.³⁹ Bear Head Energy will get the required power from the grid with a plan to build its wind turbines to produce electricity, and similarly, EverWind also has plans to construct 300 wind turbines.⁴⁰

OWE also benefits ecosystems.⁴¹ Many ecosystems are vulnerable to climate impacts⁴², hence, OWE is indirectly benefiting ecosystem protection by contributing to reducing GHG emissions. Some benefits are more direct: OWE creates artificial reefs, providing surfaces for animals to attach to and causing an increase in shellfish and the animals that feed fish and marine mammals.⁴³ In some instances, offshore wind farms help protect the inhabitants and increase the number of fish as they restrict access for ships and

³⁸ ‘Nova Scotia Pulls Ahead in Atlantic Canadian Race to Supply Germany with Green Energy | CityNews Toronto’ <<https://toronto.citynews.ca/2023/02/10/nova-scotia-pulls-ahead-in-atlantic-canadian-race-to-supply-germany-with-green-energy/>> accessed 9 October 2023; ‘Second Green Hydrogen Project Proposed for Point Tupper | CBC News’ <<https://www.cbc.ca/news/canada/nova-scotia/bear-head-proposes-second-green-hydrogen-project-point-tupper-1.6756148>> accessed 9 October 2023.

³⁹ ‘Second Green Hydrogen Project Proposed for Point Tupper | CBC News’ (n 38).

⁴⁰ *ibid.*

⁴¹ Ecosystem is defined as a biological community, which includes all of the organisms in a given area, in addition to a non-living or abiotic environment. Ecosystem also refers to processes that are required for continuing ecosystem functioning, such as productivity, energy flow among trophic levels, decomposition, and nutrient cycling; see Scott L Collins and Alan K Knapp, ‘Ecosystems as Functional Units in Nature’ [2000] *Natural Resources & Environment* 150, 151.

⁴² Nancy B Grimm and others, ‘The Impacts of Climate Change on Ecosystem Structure and Function’ (2013) 11 *Frontiers in Ecology and the Environment* 474.

⁴³ Joseph Appiott, Amardeep Dhanju and Biliانا Cicin-Sain, ‘Encouraging Renewable Energy in the Offshore Environment’ (2014) 90 *Ocean & Coastal Management* 58, 59; Helen Bailey, Kate L Brookes and Paul M Thompson, ‘Assessing Environmental Impacts of Offshore Wind Farms: Lessons Learned and Recommendations for the Future’ [2014] *Aquatic Biosystems* 2 <<http://www.aquaticbiosystems.org/content/10/1/8>> accessed 30 October 2022.

fishing boats to that marine area, creating a safety buffer zone and a de facto marine reserve.⁴⁴

1.2 The Adverse Environmental Impacts of Offshore Wind Energy

Despite OWE benefits, particularly those related to the needed energy transition to address climate change and promote economic growth, the adverse environmental impacts of offshore wind installations have been a real concern.⁴⁵ For instance, wildlife/environmental issues were among the primary reasons for opposition against OWE based on the responses from residents of Atlantic City, New Jersey, and coastal towns in Delaware.⁴⁶ The risk of collision of birds and bats with wind turbines has been one among many environmental concerns. Although the long-term effects of turbines on birds deserve further studies, existing data indicate that while indigenous birds recognize the turbines and fly around them, the same does not apply to migratory birds that are not familiar with the area.⁴⁷ Because there is no conclusive response to the extent of collision risk, one may compare the case with other sectors. For example, reports of collisions of migratory birds with offshore wind turbines are rare but this collision risk is the main concern with offshore oil and gas platforms that can be translated into offshore wind farms.⁴⁸ Nonetheless, one might say this risk is higher in offshore wind farms due to the significant number of turbines and the large space that they occupy. Another concern is that offshore wind farms are

⁴⁴ Bailey, Brookes and Thompson (n 43) 2.

⁴⁵ The likely environmental impacts of OWE and the potential conflicts with other marine uses will be reviewed in detail in chapter two of this thesis.

⁴⁶ Alison Bates and Jeremy Firestone, 'A Comparative Assessment of Proposed Offshore Wind Power Demonstration Projects in the United States' (2015) 10 *Energy Research & Social Science* 192.

⁴⁷ David A Rivkin and Laurel Silk, *The Art and Science of Wind Energy* (Jones & Bartlett Learning 2013) 124.

⁴⁸ Eva Schuster, Lea Bulling and Johann Köppel, 'Consolidating the State of Knowledge: A Synoptical Review of Wind Energy's Wildlife Effects' (2015) 56 *Environmental Management* 300, 315.

located in high-wind areas or near coasts. The migratory bird corridors are usually present in high wind areas or migratory birds usually use coastlines as their corridors.⁴⁹

Offshore turbines also create noise, which has impacts on the surrounding environment. The level of noise is different in the construction and operations phases. Piling during construction makes noises that risk auditory injuries for mammals in the immediate surroundings.⁵⁰ Such noises are likely to displace mammals for a short period of time and they possibly have effects on the long-term population as they change the mammals' behavior related to feeding, mating, and interacting.⁵¹ The noise during operation is, however, infrasound (low-frequency noise), insignificant and with no negative effects, although some studies found that factors such as foundation type, sound propagation conditions, wind speed, the hearing ability of species, and the size of windfarm must be considered in assessing the impacts on species' behavioral reactions.⁵²

Other environmental concerns in the development of wind turbines are related to changes to marine habitats and ecosystem services, including food, clean water, fiber, and other materials on which human beings rely. Pollution arising from sediment and turbidity during construction, the risk of collision of ships with wind farms, and using hydraulic fluid have impacts on the health and breeding of species.⁵³

⁴⁹ *ibid.*

⁵⁰ *ibid* 319.

⁵¹ *ibid.*

⁵² *ibid.*

⁵³ *ibid* 318.

Ecological impacts of offshore wind turbines are not, however, completely known and there are considerable gaps in knowledge.⁵⁴ The uncertainty or lack of data on the environmental and ecological impacts of the development of offshore wind turbines has created uncertainties between actual risks and perceived risks by stakeholders or regulators.⁵⁵ One part of uncertainty is derived from human beings' lack of knowledge, information, and understanding about the environment (e.g. lack of knowledge about the impacts of wind turbines on birds), which creates "systematic uncertainty".⁵⁶ This type of uncertainty might be reduced by increasing knowledge.⁵⁷ The other part of the uncertainty is due to ecological variability and the fact that ecosystems are dynamic, and the reaction of species cannot be predicted, which is called "random uncertainty".⁵⁸ In addition, ecosystems are changing in complex and unpredictable ways due to comprehensive and intensive anthropogenic interventions, which have degraded the quality of environments and their resources.⁵⁹ It is hard to assess the level of this degradation because 'the environment cannot speak for itself' and it depends on the environmental groups, scientists, and interested people to explain the environmental status and necessary protective

⁵⁴ WWF, 'Environmental Impacts of Offshore Wind Power Production in the North Sea: A Literature Overview' <<https://tethys.pnnl.gov/sites/default/files/publications/WWF-OSW-Environmental-Impacts.pdf>> accessed 30 October 2022; Ibon Galparsoro and others, 'Reviewing the Ecological Impacts of Offshore Wind Farms' (2022) 1 *Nature Partner Journals: Ocean Sustainability* 1.

⁵⁵ Galparsoro and others (n 54) 1; Aonghais SCP Cook and others, 'Quantifying Avian Avoidance of Offshore Wind Turbines: Current Evidence and Key Knowledge Gaps' (2018) 140 *Marine Environmental Research* 278; WWF (n 54).

⁵⁶ Elizabeth A Masden and others, 'Renewable Energy Developments in an Uncertain World: The Case of Offshore Wind and Birds in the UK' (2015) 51 *Marine Policy* 170 <<https://linkinghub.elsevier.com/retrieve/pii/S0308597X1400222X>> accessed 13 July 2023.

⁵⁷ *ibid.*

⁵⁸ *ibid.*

⁵⁹ Inger-Johanne Sand, 'Environmental Law in the Age of the Anthropocene: How to Normatively Communicate on Environmental Change and Risks' in Andreas Philippopoulos-Mihalopoulos and Victoria Brooks (eds), *Research Methods in Environmental Law: A Handbook* (Edward Elgar Publishing 2017) 403–404.

measures.⁶⁰ These uncertainties cause a conflict between environmental concerns and economic developments.

1.3 Research Question

The research question of this doctoral dissertation is stated as follows: How should laws and policies be improved to ensure the ecologically sustainable development of OWE in Canada broadly, and in Nova Scotia more specifically?

When there are conflicts between environmental interests and economic interests, environmental interests are not often considered due to inadequate regulations. The concepts of environmental law —such as sustainability and precautionary principles— are often imprecise, ambiguous, and context-dependent, while economic legal concepts such as private property and contract law are ‘rights-carrying norms, which are sharply defined and have holders to protect them against their breach’.⁶¹ The uncertainties in the scientific knowledge about the impacts of the development of OWE on the ecosystem and the ambiguities of environmental concepts can be intensified when regulations are inadequate, which may lead to permitting OWE projects without taking ecological considerations into account in the claimed interests of mitigating climate change or maintaining energy security.⁶² A strong regulatory framework should be in place to protect ecological integrity.

In addition to the conflict of OWE with the ecosystem and the importance of the protection of endangered species, specific marine areas, and the environment generally, the regulatory and policy framework is important as there are various sectors involved in

⁶⁰ *ibid* 404.

⁶¹ *ibid* 401–402.

⁶² Olivia Woolley, ‘Ecological Governance for Offshore Wind Energy in United Kingdom Waters: Has an Effective Legal Framework Been Established for Preventing Ecologically Harmful Development?’ (2015) 30 *The International Journal of Marine and Coastal Law* 765, 768.

marine areas. Marine uses include the exploitation of living resources (e.g. fisheries), natural resources (e.g. oil and gas), and shipping, all of which may conflict with OWE.⁶³ Two major types of conflicts have been identified in marine areas: ‘conflicts among human uses (user-user conflicts), and conflicts between human uses and the marine environment (user-environment conflicts)’.⁶⁴ As the marine sectors and areas are interconnected, integrated management is required to avoid conflicts and more importantly, achieve ecological sustainability. Considering the interconnection between all these areas, OWE should not be regulated and managed separately from other marine uses and ecosystems, but a holistic and integrated approach is needed to consider all impacts that OWE may have on marine environments and other competing marine uses.

As Canada plans to develop OWE to meet its climate commitments, among others, it needs a strong, coordinated, and integrated legal and regulatory framework based on ecological sustainability to ensure the sustainable development of OWE. For example, there is an evident lack of good policy and strong regulatory framework in the following areas:

- An overall energy strategy in which the share/targets of OWE are figured out;

⁶³ Dorota Pyć, ‘The Role of the Law of the Sea in Marine Spatial Planning’ in Jacek Zaucha and Kira Gee (eds), *Maritime Spatial Planning: Past, Present, Future* (Springer International Publishing 2019) 384–385.

⁶⁴ Fanny Douvere and Charles N Ehler, ‘Marine Spatial Planning: A Step-by Step Approach Towards Ecosystem-Based Management’ (UNESCO Intergovernmental Oceanographic Commission 2009) Manual and Guides No. 53, ICAM Dossier No. 6 19
<https://www.researchgate.net/publication/229424217_Marine_Spatial_Planning_A_Step-by-Step_Approach_Toward_Ecosystem-Based_Management> accessed 5 December 2020.

- A comprehensive national marine plan or ocean strategy in which the role of renewable energy, in particular OWE, is clearly stated — e.g. Canada’s Oceans Strategy⁶⁵ does not reflect the current knowledge, facts, and needs related to OWE;
- A strong legal and regulatory framework of OWE that ensures ecological sustainability;
- A binding marine spatial planning (MSP) process in which objectives and policies for all sectors including OWE, OWE sites, management rules for conflicts between OWE and other marine uses (shipping, fishing, ...), and the ecosystem and environment are clearly stated.

The governments of Canada and Nova Scotia agreed to expand the mandate of the Canada-Nova Scotia Offshore Petroleum Board to include offshore renewable energy.⁶⁶ To effectuate these changes, Canada amended the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act.⁶⁷ Such amendments were made under ‘An Act to amend the Canada-Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and

⁶⁵ There are two documents related to Oceans Strategy: i) Canada’s Oceans Strategy, 2002) ii) Canada’s Oceans Strategy: Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada, 2002. I included both of them under one title of the Ocean Strategy. ‘Canada’s Oceans Strategy’ (Fisheries and Oceans Canada 2002) 12 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/264678.pdf>> accessed 30 December 2020; Fisheries and Oceans Canada, ‘Canada’s Oceans Strategy: Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada’ (Fisheries and Oceans Canada, Oceans Directorate 2002) <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/264678.pdf>> accessed 15 November 2023.

⁶⁶ ‘Canada and Nova Scotia Announce Intent to Expand the Mandate of Offshore Energy Regime to Support the Transition to a Clean Economy and Create Sustainable Jobs’ (2022) <<https://www.canada.ca/en/natural-resources-canada/news/2022/04/canada-and-nova-scotia-announce-intent-to-expand-the-mandate-of-offshore-energy-regime-to-support-the-transition-to-a-clean-economy-and-create-sust.html>> accessed 22 July 2022.

⁶⁷ Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, SC 1988, c 28.

to make consequential amendments to other Acts’ (the 2024 Act).⁶⁸ The 2024 Act offers some important benefits for the development of OWE off the coast of Nova Scotia, including some certainties on the permitting procedures and the alignment with the Impact Assessment Act⁶⁹. However, revisions under the 2024 Act do not mean full regulatory protection for the environment. The ecosystems — which include the biotic and abiotic environments, their structure, and functionality — are evolving, and their reactions and shifts due to human or natural interventions are not predictable. The protection of the environment requires reviewing a myriad of laws, policies, and regulations that would apply to OWE, and relying only on an old-fashioned regulatory framework is not appropriate. In addition, the 2024 Act is another conventional and sectoral approach to a new developmental activity in oceans, which does not consider integrated management and planning for controlling the cumulative effect of combined ocean activities. The amendments under the 2024 Act give discretion to the intended board, the Canada-Nova Scotia Offshore Energy Regulator, to make decisions, which might not necessarily secure a sustainable future because the board is not a strategic decision-making body, does not have any mandate for policy formation in marine areas, and its mandate is limited to permitting and overseeing projects. In other words, the discretion of this board applies to

⁶⁸ An Act to Amend the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to Make Consequential Amendments to Other Acts, SC 2024, c 20; Natural Resources Canada, ‘Government of Canada and Nova Scotia Moving Forward to Seize the Enormous Economic Opportunities of Offshore Wind’ (31 January 2025) <<https://www.canada.ca/en/natural-resources-canada/news/2025/01/government-of-canada-and-nova-scotia-moving-forward-to-seize-the-enormous-economic-opportunities-of-offshore-wind.html>> accessed 17 February 2025. This Act received royal assent on October 3, 2024, and entered into force on January 31, 2025.

⁶⁹ Impact Assessment Act, SC 2019, c 28.

the project level and leaves out a broader discretion that should be implemented at the planning and strategic levels before projects are approved.

Such integration is required so that the health and resilience⁷⁰ of oceans for providing goods and services are not compromised.⁷¹ The development of OWE in marine areas including the territorial sea and the exclusive economic zone (EEZ) creates complex issues related to how OWE can be developed so that the marine environment is protected, and sustainability is achieved.

1.4 Literature Review

This thesis adopted screening criteria to undertake a systematic literature review. The first criterion was the relevance of materials to law, meaning that the literature in non-legal areas was excluded. This exclusion does not mean a narrow approach to the research. Materials, sources, evidence, data, and information from other disciplines were used in conducting the research. For example, the scientific knowledge regarding the environmental and ecological impacts of the development of OWE was reviewed in chapter two of this thesis, helping to understand the problems arising from the development of OWE and how the law should respond to such problems by an adequate regulatory framework.

The second criterion is that the literature is reviewed based on its relevance to the topic of this thesis and the methodologies used in the analysis. The topic is broken down

⁷⁰ Retention of structure and function despite challenges from human intervention or natural events, see Lance H Gunderson, 'Ecological Resilience--In Theory and Application' (2000) 31 Annual Review of Ecology and Systematics 425.

⁷¹ Galparsoro and others (n 54) 1; Angel Borja and others, 'Good Environmental Status of Marine Ecosystems: What Is It and How Do We Know When We Have Attained It?' (2013) 76 Marine Pollution Bulletin 16.

into three sections and the literature is categorized accordingly. The first section is related to the review of connections between renewable energy and international law or international environmental law. The second section reviews the comparative studies conducted about the development of OWE whether in national jurisdictions that I selected in my methodology section or other jurisdictions. The third section considers the scholarly sources written on various types of renewable energy in Canada.

The third criterion is that the review is not limited to OWE as it takes the other types of renewable energy into account. If the review is limited to those materials related to OWE, the important literature written by international law scholars on renewable energy in general or other types of renewable energy (e.g. wave and tidal energy) is left out. In fact, there is no unified or unique system under international law to address specific issues or problems. Even at the national level, a dedicated legal and policy framework for supporting or regulating renewable energy is rare, let alone for OWE.

1.4.1 Renewable Energy Under International Law/International Environmental Law

There is yet no specific regime dedicated to regulating renewable energy under international law. Scholars have explored how various international treaties and non-binding or soft law documents such as United Nations declarations can be applied to the renewable energy sector, whether this application is regarding promotion or in support of the development of renewable energy or for regulating potential adverse environmental effects in this sector. One useful categorization of the literature distinguishes international law that can help promote the expansion of renewable energy from international law that seeks to regulate and control the environmental impacts associated with the renewable energy sector.

Most authors have reviewed international law from the perspective of promoting or supporting the expansion of renewable energy, particularly for meeting climate objectives.⁷² For instance, various scholars criticize international law for not being effective in supporting the development of renewable energy as a means to reduce GHG emissions. Part of this ineffectiveness is that states have traditionally retained their domestic jurisdiction on energy, including renewable energy matters, keeping decisions on what laws and policies are adopted to regulate this sector within their own discretion, based on their individual needs and circumstances.⁷³ It is up to each state to decide how to take legal initiatives about granting solar permits, managing planning laws to facilitate the development of wind energy, or mandating targets to include the generation of electricity from renewable sources.⁷⁴ In addition, there are no coherent and uniform international rules for the energy sector, and the rules for this sector at the international level are fragmented and not clearly defined partly because there is no single energy market with identifiable parameters.⁷⁵

⁷² Adrian J Bradbrook, 'The Development of Renewable Energy Technologies and Energy Efficiency Measures through Public International Law' in Donald N Zillman and others (eds), *Beyond the Carbon Economy: Energy Law in Transition* (Oxford University Press 2008) 113; Imam Mulyana, 'The Development of International Law in the Field of Renewable Energy' (2016) 1 *Hasanuddin Law Review* 38; Md Karim and others, 'Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law' (2018) 11 *Energies* 1769; Stuart Bruce, 'International Law and Renewable Energy: Facilitating Sustainable Energy for All?' (2013) 14 *Melbourne Journal of International Law* 18; Yinka Omorogbe, 'Promoting Sustainable Development through the Use of Renewable Energy: The Role of Law' in Donald N Zillman and others (eds), *Beyond the Carbon Economy* (Oxford University Press 2008) 39; Peter Kayode Oniemola, 'International Law on Renewable Energy: The Need for a Worldwide Treaty Focus: International Energy Law' (2013) 56 *German Yearbook of International Law* 281; Federico Esu and Francesco Sindico, 'IRENA and IEA: Moving Together towards a Sustainable Energy Future - Competition or Collaboration' (2016) 6 *Climate Law* 233; Glen Wright, 'The International Renewable Energy Agency: A Global Voice for the Renewable Energy Era' (2011) 2 *Renewable Energy Law and Policy Review* 251.

⁷³ Bradbrook (n 72) 112.

⁷⁴ *ibid* 113.

⁷⁵ Alexandra Wawryk, 'International Energy Law: An Emerging Academic Discipline' in Paul Babie and Paul Leadbeter (eds), *Law as Change: Engaging with the Life and Scholarship of Adrian Bradbrook* (University of Adelaide Press 2014) 225 <<https://www.jstor.org/stable/10.20851/j.ctt1sq5xcn.14>> accessed 17 February 2023.

However, some authors have argued that there has been a change in this traditional practice as the rise in energy use in developed countries and emerging economies has led to an increase in energy trade around the world. New issues related to the energy sector such as the protection of the environment, trade, and secure access to energy have blurred the traditional relationship between national and international law in the energy sector and created a new regulatory and cooperative system to control the potential adverse effects related to energy production and trade. The system involves international environmental law, the law of the sea, human rights law, international investment law, international trade law, and international energy law.⁷⁶ For example, environmental adverse impacts of energy production, transportation, and consumption are some of the reasons why international regulations on GHG emissions as well as the protection of ecosystems and biological diversity have been adopted to provide sustainable energy while securing affordable energy, which is recognized in the Sustainable Development Goals (SDGs)⁷⁷ adopted by the United Nations General Assembly (UNGA) in September 2015.⁷⁸

Some authors argued that states should limit the use of fossil fuel sources that cause transboundary pollution and rely more on clean sources of energy.⁷⁹ However, Bradbrook believes that the customary international law such as the duty of states to control and regulate pollution and transboundary harms has very limited and indirect application in the promotion of renewable energy.⁸⁰ It is open to discussion whether customary international

⁷⁶ Ernst Nordtveit, 'International Energy Law in Perspective' in Tina Soliman Hunter and others (eds), *Routledge Handbook of Energy Law* (1st edn, Routledge 2020) 43–44.

⁷⁷ UNGA, 'Transforming Our World: The 2030 Agenda for Sustainable Development' (2015) A/RES/70/1. Goal 7 is to 'ensure access to affordable, reliable, sustainable and modern energy for all'.

⁷⁸ Nordtveit (n 76) 46.

⁷⁹ Bradbrook (n 72) 114.

⁸⁰ *ibid* 113.

law that creates responsibility for states, arising from transboundary pollutions of energy sources near international borders as decided by the tribunals in the *Trail Smelter*⁸¹ or *Gabčíkovo-Nagymaros*⁸² cases, can reinforce this general and indirect application to promote renewable energy.⁸³

Bradbrook thinks that other principles such as the precautionary principle, sustainable development, and intergenerational equity are currently evolving and are not part of customary international law.⁸⁴ Bradbrook also discusses the United Nations Framework Convention on Climate Change (UNFCCC)⁸⁵ and the Kyoto Protocol⁸⁶ provisions that are related to renewable energy and concludes that these provisions are hortatory and non-binding.⁸⁷ He proposed some directions for the future of international law including a soft law document preferably by the UN General Assembly but with binding targets for the adoption of renewable energy for electricity generation, and a new international convention or a protocol to an existing treaty such as UNFCCC with a focus on promoting renewable energy.⁸⁸ Bradbrook and Wahnschafft have provided ‘draft guidelines on sustainable energy production and consumption’, which is generally related

⁸¹ *Trail Smelter (United States v Canada)* (1941) 35 AJIL 684.

⁸² *Gabčíkovo-Nagymaros (Hungary v Slovenia)* (1997) ICJ Rep 7.

⁸³ Bradbrook (n 72) 114.

⁸⁴ *ibid* 115.

⁸⁵ The United Nations Framework Convention on Climate Change (opened for signature 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107.

⁸⁶ The Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005) 2303 UNTS 162.

⁸⁷ Bradbrook (n 72); Steven Ferrey, ‘The Failure of International Global Warming Regulation to Promote Needed Renewable Energy’ (2010) 37 Boston College Environmental Affairs Law Review 67.

⁸⁸ Bradbrook (n 72); Adrian J Bradbrook, ‘International Law and Renewable Energy: Filling the Void’ in Und Recht (ed), *Festschrift für Eibe Riedel zum* (Duncker & Humblot 2013) 249–250.

to energy-environment issues but has some guidance on the development of renewable energy.⁸⁹

Bruce follows the same line of argument as Bradbrook does and holds that the current international law is not adequately developed to promote renewable energy, providing evidence from various international declarations on sustainable development and the UNFCCC and the Kyoto Protocol to support this view.⁹⁰ The declarations related to sustainable development and the UNFCCC and the Kyoto Protocol have normative weight, but they are either soft laws or in the case of treaties, contain provisions whereby states have different options to reduce GHG emissions. States' commitments to adopt national laws and policies for increasing the share of renewable energy have an equal legal obligation compared to other options since states may meet their obligations by making laws and policies to develop other forms of clean technologies.⁹¹ Bruce holds that for sustainable development, energy security, and climate change, international law should create obligations for states such as binding commitments and targets.⁹² Recognizing the importance of political will for future actions, Bruce proposes some possible mechanisms for international goals and specific targets such as the increase in the share of renewable energy, an international energy convention with binding targets and timetables, an energy protocol to the UNFCCC, and an international declaration on renewable energy principles.⁹³

⁸⁹ Adrian J Bradbrook and Ralph D Wahnschafft, 'International Law and Global Sustainable Energy Production and Consumption' in Adrian J Bradbrook and others (eds), *The Law of Energy for Sustainable Development* (Cambridge University Press 2005) 182.

⁹⁰ Bruce (n 72).

⁹¹ *ibid* 39.

⁹² *ibid* 21.

⁹³ *ibid* 48.

Some scholars believe that the growth in energy use has created environmental concerns that should be addressed through the development of international environmental law including through the application of sustainable development principles, although these laws and principles are mostly flexible and non-binding.⁹⁴

Some other scholars have considered the environmental impacts of this industry and discussed how this sector can be regulated under international law.⁹⁵ McDonald and VanderZwaag have examined various international soft-law documents as well as international and regional treaties to see what obligations and procedural requirements can be applied if coastal states want to develop offshore renewable energy.⁹⁶ Their work also examined the role of international organizations in restricting offshore renewable energy. They have concluded that the current international agreements have a mostly “fragmented and recommendatory” nature.⁹⁷ States’ wide discretion to develop new and growing energy in their marine areas is limited by some general responsibilities for other marine uses such as shipping, the protection of the environment, and conducting environmental impact assessments (EIA) and strategic environmental assessments (SEA).⁹⁸

Finally, some studies have considered other aspects such as the connection between renewable energy and trade, human rights and Indigenous peoples, or the connection

⁹⁴ Bradbrook (n 72) 113; Mulyana (n 72); Karim and others (n 72).

⁹⁵ Sarah McDonald and David L VanderZwaag, ‘Renewable Ocean Energy and the International Law and Policy Seascape: Global Currents, Regional Surges’ (2015) 29 *Ocean Yearbook Online* 299; Nikolaos Giannopoulos, ‘Global Environmental Regulation of Offshore Energy Production: Searching for Legal Standards in Ocean Governance’ (2019) 28 *Review of European, Comparative & International Environmental Law*.

⁹⁶ McDonald and VanderZwaag (n 95).

⁹⁷ *ibid* 325.

⁹⁸ *ibid* 326.

between renewable energy and international energy law.⁹⁹ For example, one of the connections is to link renewable energy to international energy law, which is an emerging field. This linkage clarifies the sources of renewable energy: (i) There is no treaty to deal with issues related to renewable energy specifically, and principles can be identified through traditional sources of international law such as treaties and customary international law; (ii) Internationalized common national laws and regulatory principles such as privatization and deregulation of the electricity market or common support mechanism (feed-in tariffs or renewable portfolio standards) can be used as a source for the renewable energy sector; and (iii) Soft laws and non-binding standards or guidance of international bodies and NGOs such as guidance, service, and the informative role of IRENA to governments can be used as another source for renewable energy.¹⁰⁰

Existing literature has focused more on how to improve international law (treaties and organizational mandates/roles) to promote renewable energy while paying less attention to how to regulate or control it to prevent adverse environmental impacts. This thesis contributes to this still nascent academic conversation on regulating offshore wind to address potential adverse environmental impacts. This thesis will draw from principles and rules from international law, which support ecological sustainability and biodiversity, to inform the Canadian regulatory framework on OWE. It is particularly important to take this approach because OWE is a proven technology that can be developed to produce affordable energy for customers and this sector is likely to develop substantially to harness energy from offshore areas in the future. This thesis will expand on how international law

⁹⁹ Wawryk (n 75); Tedd Moya Mose, 'Toward a Harmonized Framework for International Regulation of Renewable Energy' (2018) 23 *Uniform Law Review* 373; Nordtveit (n 76).

¹⁰⁰ Wawryk (n 75) 227, 230, 233 and 240.

can guide Canada in the development of OWE, which might have adverse effects on the environment.

1.4.2 Renewable Energy/Offshore Wind Energy in Comparative Studies

Comparative studies have looked into the development of renewable energy/OWE in one or multiple jurisdictions. Most authors have reviewed a mixture of topics related to permitting, support mechanisms, planning/MSP, public participation/acceptance, and grid connection.¹⁰¹ The main goal is again to identify barriers to the uptake or expansion of OWE and offer ways to overcome such obstacles. Some examples from the studies are selected here to show the mainstream approach taken by scholars to conduct their comparative studies on OWE or renewable energy. For instance, McHarg and Ronne have compared Denmark and UK legal frameworks on various issues including support mechanisms (such as subsidies), market and regulatory risks (such as licensing and permitting), and planning and environmental controls (such as spatial planning and EIA).¹⁰² The authors concluded that at the time, Denmark was more successful in wind energy policies than the UK because there was more public acceptance of the benefits of investment in green energy in Denmark, and more importantly, Denmark had funded and

¹⁰¹ See, for example, IRENA, '30 Years of Policies for Wind Energy Lessons from 12 Wind Energy Markets' (2013) 18 <<https://www.irena.org/publications/2013/Jan/30-Years-of-Policies-for-Wind-Energy-Lessons-from-12-Wind-Energy-Markets>> accessed 25 August 2022; V Ramos and others, 'Legal Framework of Marine Renewable Energy: A Review for the Atlantic Region of Europe' (2021) 137 *Renewable and Sustainable Energy Reviews* 110608; Penelope Crossley, *Renewable Energy Law: An International Assessment* (Cambridge University Press 2019). <<http://ebookcentral.proquest.com/lib/dal/detail.action?docID=5985791>> accessed 30 December 2021; Jeremy Firestone and others, 'Regulating Offshore Wind Power and Aquaculture: Messages from Land and Sea' (2004) 14 *Cornell Journal of Law and Public Policy* 71.

¹⁰² Aileen McHarg and Anita Ronne, 'Reducing Carbon-Based Electricity Generation: Is the Answer Blowing in the Wind?' in Donald N Zillman and others (eds), *Beyond the Carbon Economy* (Oxford University Press 2008) 287.

supported wind energy before encountering the restrictions of electricity market liberalization while the UK's promotion of renewable energy coincided with market-oriented policies in the electricity sector.¹⁰³

Anker et al. have also identified the environmental and energy law challenges of wind energy and underscored the advantages and disadvantages of wind energy in Denmark and the United States (US). Some of the identified barriers to promoting wind energy are regulatory gaps, overlapping jurisdictions, balancing the positive effects against the negative effects, and the integration of electricity into the electricity system and the energy market.¹⁰⁴ They concluded, among others, that given that there might be some jurisdictional gaps or overlaps, there should be coordination mechanisms such as a lead agency or a primary authority to make the decision-making process more efficient.¹⁰⁵

In another work, Long suggests the elements that should be applied based on ecosystem-based management and the national practices in the European Union (EU).¹⁰⁶ For instance, it is discussed what measures can be taken to develop OWE and reconcile it with other marine activities in the marine environment.¹⁰⁷ Such measures are particularly discussed in the EU because the EU has certain directives that can be applicable in the case of the interaction of marine activities and their impacts on marine environments.

¹⁰³ *ibid* 316.

¹⁰⁴ Helle Tegner Anker, Birgitte Egelund Olsen and Anita Rønne, 'Wind Energy and the Law: A Comparative Analysis' (2009) 27 *Journal of Energy & Natural Resources Law* 145, 176.

¹⁰⁵ *ibid* 157.

¹⁰⁶ Ronán Long, 'Offshore Wind Energy Development and Ecosystem-Based Marine Management in the EU: Are the Regulatory Answers Really Blowing in the Wind?' in Myron Nordquist and others (eds), *The Regulation of Continental Shelf Development: Rethinking International Standards* (Brill 2013) 32.

¹⁰⁷ *ibid*.

Examination of multiple issues under multiple jurisdictions has also been conducted by IEA, which produced a report that focused on the management of risks through policies and regulations, the structures of the industry, and the strategies that support investors.¹⁰⁸ The report compares different approaches to OWE at the international level and identifies six pillars that contribute to an effective policy for OWE. The pillars include market scale and visibility, site development, grid connection, incentive mechanisms, supply chain development, and innovative support. Market scale and visibility, which are drivers for offshore wind development, build the developers' confidence to invest in offshore wind.¹⁰⁹ Site development differs from one jurisdiction to another, depending on the development activities that are divided between the government and the developer.¹¹⁰ Grid connection is an important element in the effectiveness of the policy as responsibilities between developers, system operators, and third parties should be defined.¹¹¹ Incentive mechanisms are vital in encouraging investment and reducing costs.¹¹² Supply chain development is important because the project must be delivered on time and based on a certain budget while a competitive environment between domestic suppliers is improved and their benefits are maximized.¹¹³ The policies on OWE have evolved and vary in different jurisdictions such as Denmark, Germany, the UK, and the Netherlands, and the governmental interventions have been reduced by a shift from fixed

¹⁰⁸ The IEA Renewable Energy Technology Deployment Technology Collaboration Programme, 'Comparative Analysis of International Offshore Wind Energy Development (REWind Offshore)' (2017) <<http://iea-rettd.org/wp-content/uploads/2017/03/IEA-RETD-REWind-Offshore-report.pdf>> accessed 8 August 2022.

¹⁰⁹ *ibid* executive summary ii.

¹¹⁰ *ibid*.

¹¹¹ *ibid*.

¹¹² *ibid*.

¹¹³ *ibid*.

supports to competitive auctions which decrease the costs.¹¹⁴ In addition, governments in some jurisdictions such as Denmark, the Netherlands, and Germany have shifted from “open door approaches” to “centralized site-specific tendering” where governments are more active by taking upfront risks in early development, managing permits, and site investigations.¹¹⁵ The IEA report also provides some recommendations. For example, it recommends that as the costs of OWE are being reduced, governments can evaluate their current targets for the development of OWE and raise their ambitions.¹¹⁶ Governments should take near-term support mechanisms to increase stability and developers’ confidence.¹¹⁷ They should also reduce risks associated with permits and site investigations.¹¹⁸

Other scholars believe that the development of this sector is not mainly linked to a streamlined permitting process or the level of financial support, but it is linked to other factors. These factors include (i) The regulatory risks arising from the change by decision-makers in the absence of robust and certain policies; or (ii) The wide discretion of local authorities in the permitting process and overrule of the national policies that are in support of renewable energy. For instance, the regulatory risk, considering the political structure and institutional autonomy that affect renewable energy policies, was examined in the research conducted by Holburn.¹¹⁹ Holburn provides a framework for assessing these risks before investors start their investments. He also compares the contrasts between the

¹¹⁴ *ibid.*

¹¹⁵ *ibid.*

¹¹⁶ *ibid* executive summary iii.

¹¹⁷ *ibid.*

¹¹⁸ *ibid.*

¹¹⁹ Guy LF Holburn, ‘Assessing and Managing Regulatory Risk in Renewable Energy: Contrasts between Canada and the United States’ (2012) 45 *Energy Policy* 654.

patterns of policies in the state of Texas in the US and the province of Ontario in Canada. This study argues that the autonomy of political agencies affects the regulatory risks. The political institutions' autonomy is a determining factor in the level of regulatory risks, and if political institutions are more autonomous, they are more resilient to political pressures.¹²⁰ This study also examines the contrast between renewable energy in Texas and Ontario and argues that one of the contributing factors in the contrast of investments in these two jurisdictions is that the regulatory risk in Ontario is higher than in Texas because the regulatory agency in Ontario is controlled by the Minister of Energy, who has wide discretion to change or revise renewable energy policies.¹²¹ In addition, the policies are more heavily adopted by ministerial directives than legislation to set targets and tariffs, which makes the directives more susceptible to change when the ministers change.¹²² This policy change has had adverse impacts on the investment level in Ontario. By contrast, the institutional structure of the Public Utilities Commission in Texas is not affected by political pressures, and the renewable portfolio standard is embedded in the legislation, which cannot be easily affected by the change of politicians, creating a stable policy environment for investors and leading to encouraging investment in the renewable energy sector.¹²³

In conclusion, most comparative studies have focused on how to streamline the permitting and planning processes to make the regulatory framework more attractive for developers to invest in renewable energy. However, this thesis will take another approach

¹²⁰ *ibid.*

¹²¹ *ibid.*

¹²² *ibid* 655.

¹²³ *ibid.*

based on ecological sustainability and will focus on other legal issues such as planning, EIA, SEA, and the laws related to the conservation of nature and environmental protection. The purpose of this focus is to inform Canada on how to improve the regulatory framework of OWE.

1.4.3 Renewable Energy in Canada

Doelle has conducted most studies on renewable energy in Canada, particularly on the East Coast of Canada. He mainly focused on the role of SEA and how it can inform the decision-making process on the development of this sector. He conducted a case study of Nova Scotia's regulatory framework of renewable energy and a specific type of renewable energy such as tidal energy or onshore wind energy. He assessed the ability of the current regulatory framework in the integration of social, environmental, and economic factors.¹²⁴ The research on onshore wind energy identifies some principles of good SEAs. For example, it emphasizes on early and proactive application of SEA, informing the provincial and municipal decision-making processes by SEA, and considering regulatory and policy context in SEAs.¹²⁵

The jurisdiction of Nova Scotia over the Bay of Fundy and the applicable national and international laws related to tidal energy have been key legal issues under consideration by scholars in the East Coast. Doelle et al. referred to several court cases in Canada and the historical evidence related to pre-Confederation (before this jurisdiction was brought to Confederation) which provide good reasons for Nova Scotia to exercise constitutional

¹²⁴ Meinhard Doelle, 'Offshore Renewable Energy Governance in Nova Scotia: A Case Study of Tidal Energy in the Bay of Fundy' (2015) 29 *Ocean YB* 271, 1; Meinhard Doelle and Rebecca Critchley, 'The Role of Strategic Environmental Assessments in Improving the Governance of Emerging New Industries: A Case Study of Wind Developments in Nova Scotia' (2015) 11 *McGill International Journal of Sustainable Development Law and Policy* 87.

¹²⁵ Doelle and Critchley (n 124) 109–112.

jurisdiction over the production of tidal energy in the Bay of Fundy.¹²⁶ The research provides some governance options for tidal energy in Nova Scotia. It recommends that EIA under the Nova Scotia Environment Act¹²⁷ should be used to engage the public and address different environmental issues and competing uses in the Bay of Fundy.

Doelle et al. suggest that SEA should be employed to integrate planning and consider broad policies.¹²⁸ The authors also provide some options for provincial governance such as developing a broad policy, integrated planning, and zoning, or the designation of areas for different purposes. Furthermore, this research suggests some options for managing uncertain provincial and federal jurisdictions over the development of tidal energy in the Bay of Fundy and constraints arising from the public right to fish and its conflict with the development of tidal energy.¹²⁹ These options for addressing the relationship between the federal and provincial jurisdictions include unilateral provincial decision-making for the development based on the historical grounds of property claim over the Bay of Fundy, a negotiation with the federal government to delineate provincial and federal waters, and finally, federal-provincial joint management based on a mutual agreement.¹³⁰ The options for managing conflicts with fisheries could be either through enacting federal legislation for granting authorization for offshore renewable energy or by provincial leasing and licensing tidal energy.¹³¹

¹²⁶ Meinhard Doelle and others, 'The Regulation of Tidal Energy Development Off Nova Scotia: Navigating Foggy Waters' (2006) 55 UNB Law Journal 27, 41.

¹²⁷ Environment Act, SNS 1994-95, c 1.

¹²⁸ Doelle and others (n 126) 64.

¹²⁹ *ibid* 65–67.

¹³⁰ *ibid* 68–69.

¹³¹ *ibid* 70.

The federal regulatory regime applicable to offshore renewable energy and the federal and provincial boundary issues have been further studied. Watt and Westin specifically discussed the application of the Canadian Energy Regulator Act¹³², its shortfalls, and the solutions. Their perspectives in the identification of shortfalls are mainly focused on the regulatory uncertainties that relate to the jurisdictional or legal gaps, which hinder or delay the development of offshore renewable energy. The uncertainties include federal and provincial jurisdictional, regulatory, and boundary overlaps and complexity arising from such overlapping jurisdictions, the provincial benefits such as royalties and dual authorities involved in the permitting work and activities under the Canadian Energy Regulator Act and seabed authorization under the Federal Real Properties and Federal Immovable Act¹³³. They suggest a “without prejudice” management agreement under a similar procedure that had already occurred under the Accord Acts¹³⁴ can help to avoid the regulatory complexities.¹³⁵ For an effective management of offshore competing uses, they propose that an integrated planning and management or an integrated plan, using strategic or regional assessments, can be an effective way to balance such competing interests.¹³⁶

The potentials of tidal energy in Canada have been further examined under a multidisciplinary approach to review the political, financial, and regulatory challenges of this sector in Canada, with a review of tidal energy development in Nunavut and Nova

¹³² Canadian Energy Regulator Act, SC 2019, c 28.

¹³³ Federal Real Property and Federal Immovables Act, SC 1991, c 50.

¹³⁴ Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (n 67); Canada–Newfoundland and Labrador Atlantic Accord Implementation Act, SC 1987, c 3.

¹³⁵ Daniel Watt and Lucia Westin, ‘The Regulation of Offshore Renewable Energy under the Canadian Energy Regulator Act Towards Full and Rational Development of ORE in Atlantic Canada’ (2022) 10 Energy Regulation Quarterly 21, 41–43.

¹³⁶ *ibid* 44–45.

Scotia.¹³⁷ Fisch holds that the federal and provincial approvals lack a coordinated approach which is necessary to prevent delays in decision-making and uncertainties in the approval of tidal energy projects.¹³⁸ Fisch makes references to the streamlined procedures in other jurisdictions such as the UK where a single authority is a contact point for all permits and another authority for seabed licensing while Canada has a complicated permitting system and needs a political will to reform the current regulatory structure.¹³⁹

The literature has focused on OWE recently. Robertson et al. published an article on the regulatory landscape of offshore wind in Canada by reviewing the relevant legislation and the required permits for the development of this technology and providing some lessons learned from other jurisdictions such as the UK, Denmark, and the US.¹⁴⁰ This study significantly focuses on the permitting and consenting processes that should be in place in a way that increases the ‘greatest efficiency and chance of success’ for developers.¹⁴¹ They discuss that due to the constitutional structure in Canada, while the federal and provincial laws can be separately applied based on the location of the development, laws from both levels of legislation can be applied in case of permitting the development of OWE. This study recommends that a one-stop shop is a good avenue for streamlining the permitting process and reducing complexities arising from constitutional boundaries and seabed rights.¹⁴² The current plan of Nova Scotia as well as Newfoundland

¹³⁷ Justin G Fisch, ‘Tidal Energy Law in Canada: Hindering an Untapped Potential for International Primacy’ (2016) 21 *Appeal: Review of Current Law and Law Reform* 37, 39.

¹³⁸ *ibid* 48.

¹³⁹ *ibid* 49.

¹⁴⁰ Leah M Robertson, Matthew J Dorreen and Mohammad Ali Raza, ‘Harnessing Offshore Wind in Canada: The Regulatory Landscape for Offshore Wind Development and Lessons Learned from the United Kingdom, Denmark, and the United States’ (2023) 37 *Ocean Yearbook Online* 276.

¹⁴¹ *ibid* 278–279.

¹⁴² *ibid* 305–306.

and Labrador to expand the mandates of the petroleum boards to include offshore renewable energy is a one-stop-shop approach, and in the case of other provinces, a lead federal authority can be a contact point for developers.¹⁴³ For impact assessment, the study also suggests a harmonized approach through the Impact Assessment Act¹⁴⁴, which is preferred over other methods such as the delegation of authority and separate assessments.¹⁴⁵ A regional assessment, such as the current regional assessment for Nova Scotia, is viewed as useful for such harmonization and reduction of delays and complexities.¹⁴⁶

Although this recent study has attempted to fill a gap in the literature, it does not provide a full, in-depth, and critical analysis as its main focus is on the permitting process. It does not offer any information and analysis about how laws and policies should respond to other key issues arising from the development of OWE such as the conflict of OWE development with the environment or other uses, and the cumulative effects of offshore activities. The one-stop-shop permitting and the harmonization through a regional assessment without ensuring sustainability and integrated management of offshore activities leave nothing but a sectoral approach that does not fully address how the ecological impacts of this development should be addressed. The study fails to explain how the ecological impacts should be regulated and how one report out of a regional assessment can reasonably anticipate and respond to the specific problems of a project. The comparative study of this research also does not clarify how other jurisdictions have

¹⁴³ *ibid* 306–307.

¹⁴⁴ Impact Assessment Act (n 69).

¹⁴⁵ Robertson, Dorreen and Raza (n 140) 308.

¹⁴⁶ *ibid*.

regulated or managed the environmental impacts of OWE. Finally, this study lacks a theoretical framework or lens to assess the regulatory framework of OWE.

The role of MSP is important when it comes to the development of OWE whose impacts are not fully known. The West Coast adopted a regime in which OWE is by some means tied to MSP. The partnership established on the West Coast adopted three broad categories, which include the Protection Management Zone, Special Management Zone, and General Management Zone. Renewable energy generated from wind, tidal, wave, and other renewable sources was identified under a Special Management Zone, which ‘allocates space for high priority and/or high potential marine uses and activities’.¹⁴⁷

Another characteristic of the model on the West Coast, as discussed by Diggon et al., is that it has taken another approach by adopting a planning process involving strong participation by First Nations and valued socio-ecological resilience. They argue that the participation of First Nations in the marine planning process embraces their rights, values, knowledge, and governance structures, is aligned with the ecosystem-based approach in MSP, and contributes to social and ecological resilience.¹⁴⁸ The First Nations’ participation was a core element that promoted their priorities and values, particularly their territorial rights and governance structures when they collaborated in the planning process.¹⁴⁹ The First Nations participated in the territorial plans and shared their priorities, values, and traditional ecological knowledge while such plans were harmonized at a broader sub-

¹⁴⁷ Charlie Short and others, ‘Marine Zoning for the Marine Plan Partnership (MaPP) in British Columbia, Canada’ (2023) 152 Marine Policy 105524, 6 & 7. .

¹⁴⁸ Steve Diggon and others, ‘The Marine Plan Partnership: Indigenous Community-Based Marine Spatial Planning’ (2021) 132 Marine Policy 103510.

¹⁴⁹ *ibid* 6.

regional level.¹⁵⁰ The connection between territorial plans and sub-regional plans supports a more integrated approach towards the protection of ecosystems. In addition, the community-based or bottom-up approach can be more effective in terms of the possibility of compliance by marine users if stakeholders are engaged in the process and accept the outcome.

This model of community-based plans is, however, limited in terms of jurisdictional coverage and harmonization with federal-level plans. In September 2011, the federal government decided to withdraw from partnership with First Nations and provincial governments, which caused a planning transition from a detailed and inclusive planning effort that carefully considered geographic areas to a more simplified, high-level strategic plan that no longer emphasizes specific locations.¹⁵¹ Lack of federal involvement in the Marine Plan Partnership in British Columbia left out a critical part of management related to fisheries and marine transportation.¹⁵² It seems that this type of planning leads to uncoordinated actions by a disconnection between different levels of government and lacks a holistic approach to integrating all marine activities and ecosystems, making less reliable actions and outcomes for achieving ecological sustainability. It should be, however, noted that DFO has recently published the Marine Spatial Planning Framework for the Southern B.C. Planning Area that involved the Province of British Columbia, First Nations, Indigenous organizations and stakeholders to create a framework for future stages of MSP.¹⁵³

¹⁵⁰ *ibid* 5.

¹⁵¹ *ibid* 4.

¹⁵² Short and others (n 147) 11.

¹⁵³ Fisheries and Oceans Canada, 'Southern B.C. Marine Spatial Planning Framework' <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41270939.pdf>> accessed 5 February 2025.

Another weakness is that the essence of the framework created out of the provincial and community collaboration is policy, which can act to guide decision-makers in assessing marine activities and provide some flexibility, adaptation, and efficiency when the plan is implemented, but it can be problematic because this framework does not provide legally designated zones and is not enforceable, causing a source of disagreement if marine uses do not follow the policy framework at the implementation stage.¹⁵⁴ In addition, suppose marine zoning is kept simple to avoid complexities that could arise from employing different terms and categories of marine uses with different variables. In that case, each marine user might fail to consider other marine users' interests due to self-economic interests, and the complication in the implementation and compliance stages might not be considered.¹⁵⁵ Furthermore, the zoning approach adopted by the partnership might not *per se* be effective because MSP is expected to provide certainty for marine users and offer guidance on their conflicts and about how to preserve ecosystems but the straightforward method used by this approach does not solve these complicated problems.

In conclusion, this thesis contributes and fills gaps in the existing literature related to various topics including:

- (i) Jurisdictional issues related to the territorial sea and EEZ, which are different from the jurisdictional issues of onshore wind and other types of onshore renewable energy;
- (ii) The environmental impacts of OWE in marine areas and relevant regulatory matters;
- (iii) The permitting processes;
- (iv) The potential conflicts with other marine uses such as shipping and fisheries;

¹⁵⁴ Short and others (n 147) 9.

¹⁵⁵ *ibid* 11.

(v) MSP;¹⁵⁶

(vi) The conflict between climate objective, which is going to be achieved by OWE, and the impact of OWE on ecological objectives.

(vii) The cumulative impacts of OWE on the marine environment and biodiversity;¹⁵⁷ and

(viii) Avoiding the compromise of marine biodiversity and ecosystem functionality with the development of OWE.¹⁵⁸

1.5 Methodologies

The selected methodologies which are doctrinal, comparative, and theoretical will guide this research on how the questions within the field of my inquiry are addressed.¹⁵⁹

The doctrinal methodology will help to understand, apply, and analyze the “current” status of laws related to OWE. A comparative legal study will provide insights into how the selected jurisdictions have approached regulating the development of OWE. The theoretical approach of “ecological sustainability” will guide in evaluating the current legal systems. The selected methodologies will help each other as well as the substance of the research to be closely connected. Each methodology has its limitations which can be offset by another one. For example, the contextual analysis of my inquiry in the comparative study will minimize the limitations of doctrinal methodology and broaden the view of how

¹⁵⁶ MSP, which is a part of the marine regulatory framework, offers certainty for investors/developers and facilitates the integrated management of marine activities. An ecosystem-based management should be adopted for the management of human activities including OWE to ensure the cumulative impacts of the activities do not cross the marine ecosystem capacity.

¹⁵⁷ Woolley, ‘Ecological Governance for Offshore Wind Energy in United Kingdom Waters’ (n 62) 765; Olivia Woolley, ‘Ecological Law in the Anthropocene’ in K Anker and others (eds), *From Environmental to Ecological Law* (Routledge 2021) <<https://dro.dur.ac.uk/32520/1/32520.pdf?DDD19+mxvs39+kswl88>> accessed 29 May 2023.

¹⁵⁸ Woolley, ‘Ecological Governance for Offshore Wind Energy in United Kingdom Waters’ (n 62) 765; Woolley, ‘Ecological Law in the Anthropocene’ (n 157).

¹⁵⁹ Robert Cryer and others, *Research Methodologies in EU and International Law* (Hart Publishing 2011) 5.

external sources such as politics or economics will affect the regulatory framework of a jurisdiction. The theoretical approach through ecological sustainability will also offer guidance and perspectives to examine the premises and underlying principles of the current anthropocentric legal system. The ecological sustainability methodology can also provide a stance to rethink the underlying assumption of the existing legal system in Canada. This section will describe and examine each methodology and explain how each of them will be used in this thesis.

Finally, while it is challenging to make a clear distinction in the functions of the methodologies used in this research, it should be noted that doctrinal and comparative law methodologies have primarily been employed for the application of laws and policies in the specific context of OWE and learn how to improve them based on practices of other states, ecological sustainability has provided the theoretical framework and guided the research with a focus on ecological integrity.

1.5.1 Doctrinal Methodology

Doctrinal methodology is the core, unique, creative, and rigorous methodology in law, which synthesizes laws, regulations, rules, principles, policies, values, and norms.¹⁶⁰ It is unique, self-contained, and autonomous because it takes an internal perspective. In other words, a scholar analyzes law based on its normative framework without the need to refer to any external discipline.¹⁶¹ This methodology is also creative and systematic because ‘at its best, [it] involves rigorous analysis and creative synthesis, the making of

¹⁶⁰ Terry Hutchinson and Nigel Duncan, ‘Defining and Describing What We Do: Doctrinal Legal Research’ (2012) 17 *Deakin Law Review* 84.

¹⁶¹ Jan M Smits, ‘What Is Legal Doctrine? On the Aims and Methods of Legal-Dogmatic Research’ in Rob van Gestel, Hans-W Micklitz and Edward L Rubin (eds), *Rethinking Legal Scholarship: A Transatlantic Dialogue* (Cambridge University Press, Maastricht European Private Law Institute Working Paper No 2015/06 2017) 5 <SSRN: <https://ssrn.com/abstract=2644088>> accessed 3 January 2023.

connections between seemingly disparate doctrinal strands, and the challenge of extracting general principles from an inchoate mass of primary materials'.¹⁶² In this methodology, primary and secondary sources are used to provide a coherent analysis of the current or emerging laws and practices to understand the nature and parameters of the laws related to the research question.¹⁶³ The first step is to find the statement of the law in the legislation and/or cases and then to interpret and analyze laws within a specific context.¹⁶⁴

Legal reasoning using deductive and inductive methods is adopted to analyze laws and policies. Deductive reasoning is used when there is a law and the researcher applies those laws to a problem or responds to a question in accordance with the laws.¹⁶⁵ Inductive reasoning is finding an underlying premise or a general rule of law or proposition, which is normally taken from court cases.¹⁶⁶ The analogy also may be applied to consider similar situations and similar cases that should be treated by similar principles or outcomes.¹⁶⁷

Using doctrinal methodology may create some limitations that deserve consideration. Doctrinal methodology may look old-fashioned and not creative enough to produce rigorous academic work.¹⁶⁸ Being limited within the boundary of “law” and its concepts, categories, and criteria does not allow for assessing the social impacts, making it more formalistic and inflexible.¹⁶⁹ Another limitation of doctrinal methodology is that it

¹⁶² Council Of Australian Law Deans, ‘Statement on the Nature of Legal Research’ (2005) 3 <<https://cald.asn.au/wp-content/uploads/2017/11/cald-statement-on-the-nature-of-legal-research-20051.pdf>> accessed 3 January 2023.

¹⁶³ Hutchinson and Duncan (n 160) 103 & 113.

¹⁶⁴ *ibid* 110.

¹⁶⁵ *ibid* 111.

¹⁶⁶ *ibid*.

¹⁶⁷ *ibid*.

¹⁶⁸ Smits (n 161) 4.

¹⁶⁹ Terry Hutchinson, ‘Doctrinal Research: Researching the Jury’ in Dawn Watkins and Mandy Burton (eds), *Research Methods in Law* (Second Edition, Routledge 2018) 24.

can be isolated from theory and practice. While some scholars believe that legal systems are autonomous and they can be the subject of inquiry and can form the conceptual and theoretical framework of legal research, others argue that law should be open, purposive, instrumental, and responsive; hence it cannot be separated from contexts such as politics, economics, and social changes.¹⁷⁰ For this reason, this thesis will take an ecological perspective to make the research open to other ideas and knowledge. Further explanation is provided in the section below on the relevance of ecological sustainability to the research in this thesis.

In addition, the doctrinal methodology in this thesis will involve a combination of hermeneutic, argumentative, normative, and explanatory analysis. It will have a hermeneutic analysis because primary sources will be interpreted and relevant interpretations will be discussed¹⁷¹ or argumentation will be used as the primary instrument to support a solution or an interpretation (e.g. chapters three and four of this thesis).¹⁷² This thesis will also consider an explanatory analysis¹⁷³ as it will explain the ecology and other disciplines (e.g. chapter two of this thesis) that have relevance to the law and may have higher norms (e.g. ecological sustainability discussion in the last part of this chapter) from which the law is or should be derived. The methodology will also involve normative claims¹⁷⁴ (e.g. law is right when it preserves ecological integrity) as well because this thesis

¹⁷⁰ Pauline Westerman, 'Open or Autonomous: The Debate on Legal Methodology as a Reflection of the Debate on Law' [2009] SSRN Electronic Journal 1 <<https://ssrn.com/abstract=1609575>> accessed 4 January 2023.

¹⁷¹ Mark Van Hoecke, 'Legal Doctrine: Which Method(s) for What Kind of Discipline?' in Mark Van Hoecke (ed), *Methodologies of Legal Research: Which Kind of Method for What Kind of Discipline?* (Hart Publishing 2011) 4.

¹⁷² *ibid.*

¹⁷³ *ibid* 7–8.

¹⁷⁴ *ibid* 10.

will make choices based on the underlying values and interests of environmental norms, sustainability, and ecological integrity to interpret laws.

1.5.2 Comparative Law

Comparative law is used as a methodology to provide critical reflections. It is not a distinct subject in law like contract law. For example, laws related to contracts produce binding laws, rules, or principles.¹⁷⁵ However, from the perspective of some scholars, comparative law is considered a systemic method of applying comparative techniques to legal study and research.¹⁷⁶ Using techniques denotes acting like a legal engineer who does not apply “critical methodological self-reflection”.¹⁷⁷ However, the opinion of scholars who consider comparative law as a scientific method, with “its own distinctive province”, objectivism, and positivism, and something “ethically neutral and unrelated to power” is criticized.¹⁷⁸ The main problem with comparative laws as a scientific method is the exclusion of ethical and political implications of laws under foreign legal systems.¹⁷⁹ Nonetheless, the application of comparative study as a methodology does not undermine it so long as the research involves various contextual and theoretical analyses.

Comparative law has some benefits. It contributes to legal education like other branches of law and increases knowledge and understanding of other legal cultures, legal thinking, use of language, and intellectual application of laws.¹⁸⁰ Comparative law also may change perceptions and assumptions that may exist in one legal system by stimulating

¹⁷⁵ Gunter Frankenburg, *Comparative Law as Critique* (Edward Elgar Publishing 2016) 37–38.

¹⁷⁶ WJ Kamba, ‘Comparative Law - A Theoretical Framework’ (1974) 23 *International and Comparative Law Quarterly* 36, 486.

¹⁷⁷ Frankenburg (n 175) 40.

¹⁷⁸ *ibid* 39 & 54.

¹⁷⁹ *ibid* 41.

¹⁸⁰ Michael Bogdan, *Concise Introduction to Comparative Law* (Europa Law Publishing 2013) 15.

other ways of thinking and providing other efficient solutions, methods, rules, and procedures to similar social and economic phenomena.¹⁸¹ It questions the validity and soundness of the norms and solutions underlying one legal system.¹⁸² It provides knowledge, information, insights, and experiences that aid legislators, decision-making authorities, and policymakers in forming principles, rules, procedures, and policies. It also broadens our perspective and informs us of experiences, successes, and failures of other systems.¹⁸³ In addition, legal research through comparative law extends and refines our knowledge about specific areas of law and helps legal education.¹⁸⁴ Finally, comparative law facilitates making laws and policies and leads to the improvement of current laws.¹⁸⁵ It helps not only find new rules and solutions but also guide what solution should be avoided.¹⁸⁶

The common method used by traditional comparatists is functionalism. Under functionalism, the purpose of analyzing laws of different systems is to free the solutions from their context and strip them of their national implications to respond to an identified problem of a legal system.¹⁸⁷ Functionalism is a method for responding to social needs or interests and has orientations towards practical solutions for social problems.¹⁸⁸ In other

¹⁸¹ *ibid* 16.

¹⁸² Kamba (n 176) 492.

¹⁸³ *ibid* 493.

¹⁸⁴ *ibid* 494.

¹⁸⁵ *ibid* 489.

¹⁸⁶ *ibid* 496–497; Bogdan (n 180) 17. Caution should be exercised that foreign legal rules and policies should be adopted critically with required modifications and adjustments, otherwise, such adoption could be inappropriate or harmful.

¹⁸⁷ Konrad Zweigert and Hein Kötz, *Introduction to Comparative Law*, vol I (Oxford: Oxford University Press 1998) 8; Frankenburg (n 175) 53–54.

¹⁸⁸ Oliver Brand, ‘Conceptual Comparisons: Towards a Coherent Methodology of Comparative Legal Studies’ (2007) 32 *Brooklyn Journal of International Law* 409.

words, this method explores what the actual function of laws or legal institutions are and to what social problems they respond.¹⁸⁹ Functionalists hold that problems are similar or even identical in different societies and legal systems or the law tends to resolve or regulate those social facts or problems in the same way.¹⁹⁰ From this perspective, social problems are similar, and the law provides similar solutions, although there might be significant differences in the history and development of legal systems.¹⁹¹

This method of comparison has received some objections. The method is formalistic and the produced result arising from its application may not be well-connected to socio-economic and historical circumstances of where such laws are created.¹⁹² It is also a positivist approach to law and its attention to “law in action” is limited.¹⁹³ In addition, while the method contends that it takes a factual approach, it does not take into account that social facts vary from one legal system to another.¹⁹⁴ Although functionalism creates new rules and functionalists recontextualize the solution when transferred to another legal system, they only see the similarities in the questions and solutions and do not respect significant differences in history, concepts, and operations between the legal systems and their implications.¹⁹⁵

Because of said challenges, careful and critical thinking should be considered in the comparative study. Comparative study as critique provides good insights as it considers reflection on the existing theories, rules, and institutions. Under this approach, legal

¹⁸⁹ *ibid.*

¹⁹⁰ *ibid* 409–410.

¹⁹¹ *ibid* 410.

¹⁹² *ibid* 413.

¹⁹³ *ibid.*

¹⁹⁴ *ibid* 419.

¹⁹⁵ Frankenburg (n 175) 57.

comparison should be conducted through distancing and differencing. Distancing is ‘an attempt to break away from firmly held beliefs and settled knowledge and as an attempt to resist the power of prejudice and ignorance’.¹⁹⁶ It also requires that information and insights from foreign law not be accepted intact but should be carefully reviewed and critically reflected upon. Distancing is helpful because assumptions should not be based on previous knowledge and research should be objective about what can be learned from the jurisdictions under consideration. The comparison also needs differencing or making ‘a conscious effort to establish subjectivity, that is, the impact of the self, the observer's perspective and experience, is scrupulously taken into account’.¹⁹⁷ A comparatist considers and interprets law within the cultural context that law constitutes or is constituted by law.¹⁹⁸

This thesis employs three distinct criteria for selecting jurisdictions to conduct a comprehensive comparative study. The first criterion focuses on what basis for comparison is available. It is essential that the comparative study is anchored in jurisdictions that exhibit common features or functions. Specifically, this entails analyzing regions with analogous socio-economic conditions, such as similar levels of social and economic development and cultural contexts.¹⁹⁹ By ensuring these commonalities in terms of shared characteristics and structures, the validity and relevance of the comparison among the selected jurisdictions are ensured. This approach facilitates a clearer understanding of the similarities and differences between the areas under study, ultimately leading to more

¹⁹⁶ Gunter Frankenburg, ‘Critical Comparisons: Re-Thinking Comparative Law’ (1985) 26 Harv Int’l L J 414.

¹⁹⁷ *ibid.*

¹⁹⁸ Frankenburg (n 175) 72.

¹⁹⁹ George Mousourakis, ‘Some Methodological Issues in Comparative Law’ in George Mousourakis, *Comparative Law and Legal Traditions* (Springer International Publishing 2019) 112.

insightful conclusions.²⁰⁰ As a result of this selection criterion, this thesis selects the UK, Germany, and Denmark as these countries have comparable socio-economic situations to Canada. Although the Netherlands and Belgium may not be excluded by this criterion, this thesis focused on the selected jurisdictions i.e. the UK, Germany, and Denmark. The selected jurisdictions are deemed representative of the EU's experience of OWE, which could provide valuable insights for Canada at this early stage of planning. It is not expected that adding the Netherlands and Belgium would alter the results of this research significantly as all these jurisdictions have been under the same EU laws and policy framework. It is also important to note that practical challenges, including a lack of funds, prevented the inclusion of the Netherlands and Belgium, which were initially intended for review. Nevertheless, this thesis incorporates some examples of environmental impacts or regulations related to OWE from these two jurisdictions in chapters two and five as far as possible.

In addition, the first criterion excludes countries that have been successful in significant development of OWE, but their socio-economic situations are not comparable to Canada. China is the best example of this exclusion as it has the largest number of offshore wind farms in the world, but this thesis did not select it because it lacks a comparable socio-economic situation to Canada. It does not have a capitalist economy like Canada and the other selected jurisdictions. In other words, China has a planned market, and its socioeconomic order of society is different from Canada and other jurisdictions, which are capitalist and have market-based economies.

²⁰⁰ *ibid.*

The second criterion is the scale of development of OWE in the selected jurisdictions. The selected jurisdictions have extensive experience in the development of OWE and their regulatory frameworks are well-developed. This criterion excludes other jurisdictions that have not developed OWE or their developments have been insignificant. For example, with a few operational offshore wind farms off Rhode Island and Virginia, the US has insignificant OWE development.²⁰¹ In addition, although the Biden-Harris Administration was promising for OWE as they approved 11 OWE projects,²⁰² Trump withdrew from OWE leasing all areas within the US Offshore Continental Shelf, which also included withdrawal from considering any new or renewed OWE leasing.²⁰³ These political uncertainties prevent learning from actual opportunities and challenges that the recent regulatory framework could create for OWE. Additionally, the US scholarship has been drawing on the monitoring results and regulatory framework of jurisdictions from the EU to improve its regulations or develop its impact assessments.²⁰⁴ Such reliance in the literature on the EU's experience reinforces that the selection criteria of this thesis are appropriate.

²⁰¹ 'WINDEXchange: Offshore Wind Energy' <<https://windexchange.energy.gov/markets/offshore>> accessed 22 November 2024.

²⁰² 'Biden-Harris Administration Approves Eleventh Offshore Wind Project in U.S. History | U.S. Department of the Interior' (20 December 2024) <<https://www.doi.gov/pressreleases/biden-harris-administration-approves-eleventh-offshore-wind-project-us-history>> accessed 10 February 2025.

²⁰³ 'Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects' (*The White House*, 21 January 2025) <<https://www.whitehouse.gov/presidential-actions/2025/01/temporary-withdrawal-of-all-areas-on-the-outer-continental-shelf-from-offshore-wind-leasing-and-review-of-the-federal-governments-leasing-and-permitting-practices-for-wind-projects/>> accessed 10 February 2025.

²⁰⁴ Firestone and others (n 101); Paul A English and others, 'Improving Efficiencies of National Environmental Policy Act Documentation for Offshore Wind Facilities Case Studies Report' (US Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs 2017) <<https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Improving-Efficiencies-of-National-Environmental.pdf>> accessed 6 August 2023.

Finally, the selected jurisdictions have similarly adopted MSP or integrated management plans and OWE has been included in MSP. MSP or integrated management or other similar institutions aim at integrated management of marine uses, space, and the relationship between human development activities and ecosystems. This thesis supports MSP as an appropriate tool for integrated management. For this reason, this thesis excludes jurisdictions such as Taiwan that have significant OWE installed capacity but lack a developed MSP or little guidance can be drawn from their management framework.²⁰⁵ More details will be discussed in chapter five of this thesis.

1.5.3 Theory as Methodology: Ecological Sustainability as a Theoretical Framework

Linking OWE to the sustainability concept raises questions: what does this concept mean; what are its main forms; and what theoretical framework should be used to help enrich a sustainable future for Canada's OWE?

Including environmental, social, and economic considerations in the concept of sustainable development has sparked debates about its normative implications. This concept is defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.²⁰⁶ The three pillars (social, economic, and environmental) of sustainability is another definition of this concept, commonly represented by three intersecting circles with overall sustainability at

²⁰⁵ Meng-Tsung Lee and others, 'Towards Marine Spatial Planning in Southern Taiwan' (2014) 6 Sustainability 8466; Wen-Hong Liu and others, 'The Role of Local Government in Marine Spatial Planning and Management in Taiwan' (2011) 35 Marine Policy 105; Chung-Ling Chen, Tuey-Chih Lee and Chien-Ho Liu, 'Beyond Sectoral Management: Enhancing Taiwan's Coastal Management Framework through a New Dedicated Law' (2019) 169 Ocean & Coastal Management 157.

²⁰⁶ The United Nations Environment Program, 'Report of the World Commission on Environment and Development: Our Common Future' (1987).

the center. Some scholars consider sustainable development as a universally accepted concept, reflected in international declarations and treaties related to the environment, trade, and investment as well as national laws and policies, and business sector strategies.²⁰⁷ However, others argue that this concept is ambiguous, imprecise, and an oxymoron, which lacks parameters to measure it, difficult to assess its performance, and hard to strike a balance between social and economic development and environmental protection.²⁰⁸ In addition, there is debate whether the environment, society, and economy should be considered as three equal pillars of sustainable development, which can be optimized concurrently, or the environment should be prioritized and regarded as a foundation of society and the economy, since society and an economy cannot survive without ecosystem services.²⁰⁹

If we consider the economy, society and the environment as three parallel pillars of sustainable development that have equal importance, a weak form of sustainability or anthropocentrism will prevail in practice. This view has been the dominant international approach to sustainable development. A weak form of sustainability is often supported by governments and corporations as they believe that ecological sustainability is a concern that should be addressed separately from economic sustainability.²¹⁰ Anthropocentrism

²⁰⁷ David Hunter, James Salzman and Durwood Zaelke, *International Environmental Law and Policy* (5th edn, Foundation Press 2015) 169; Amy Ng Sing Fuay, 'A Critique on the Concept of Sustainable Development' (2001) 28 JMCL 131; Giulia Capitani and Giovanni Comazzetto, 'The Concept of Sustainable Development in Global Law: Problems and Perspectives' (2019) 5 Athens Journal of Law 35.

²⁰⁸ Fuay (n 207) 131.

²⁰⁹ Neil K Dawe and Kenneth L Ryan, 'The Faulty Three-Legged-Stool Model of Sustainable Development' (2003) 17 Conservation Biology 1458, 1458–1460; John C Dernbach and Scott E Schang, 'Liberating Sustainable Development From Its Non-Historical Shackles' (2022) 54 Arizona State Law Journal 724.

²¹⁰ Klaus Bosselmann, 'Losing the Forest for the Trees: Environmental Reductionism in the Law' (2010) 2 Sustainability 2437.

indicates human beings are the center of the world, can take benefit of nature, and have the right to exploit the world to meet their interests. It is instrumentalist and mainly based on self-interest and economics. From an anthropocentric view, human beings consider nature as an “object” or property and protect it to use for meeting human needs and saving human beings’ interests.²¹¹ In other words, when nature has economic value, its protection has value too. Protection of the environment can be evaluated by economic methods and damaging activities can be controlled by economic means rather than by far-reaching ethical considerations.²¹² The economic approach gives decision-makers tools to evaluate what polluters should pay and how to decide when trade-offs of different conflicting values are in question.²¹³

Societies and states have largely taken this epistemological and economic position, which has been embedded in environmental laws and policies. The ontology of humans and nature, their separations, economics, and cost-benefit analysis have played a central role in environmental law principles such as the polluter pays principle.²¹⁴ This ontology has exerted heavy pressure on the marine ecosystem over the last century, causing ecological and biodiversity loss. Human beings have used their freedom to destroy the common nature (“tragedy of the commons”), saved so many trees, but lost the forests, and rationally maximized their individual benefits at the expense of the environment.²¹⁵ Current environmental law based on anthropocentrism has not been effective in truly protecting the

²¹¹ Vito De Lucia, ‘Towards an Ecological Philosophy of Law: A Comparative Discussion’ (2013) 4 J Hum Rts & Env’t 167, 175–176.

²¹² Alexander Gillespie, *Internatioanal Environmental Law, Policy and Ethics* (Clarendon Press 1997) 37.

²¹³ *ibid* 38.

²¹⁴ De Lucia (n 211) 170.

²¹⁵ Bosselmann, ‘Losing the Forest for the Trees’ (n 210) 2426.

environment as it does not prohibit harm to the integrity of ecosystems.²¹⁶ Environmental laws have largely promoted the right to use environmental resources and they have often required that in case of harm, it must be reduced or mitigated to the extent possible, while not requiring the sustainable use of resources.²¹⁷

There are other important problems related to the anthropocentric self-interested approach. There are some parts of nature that do not have utilitarian value and human beings may not preserve them if only the utilitarian value is used as the basis of the preservation of the environment.²¹⁸ In addition, and consequently, if the present value of some parts of nature is not needed any longer, those parts may not be preserved because their values are lost.²¹⁹ Economic evaluation of the environment has other weaknesses as well. Some parts of nature have utilitarian values for human beings, but they are difficult to measure based on economic methods such as cost-benefit analysis and tend to be ignored.²²⁰ Even those parts in which their economic values can be measured are short-sighted and do not typically consider the sensitive and fragile condition of the environment.²²¹

Ecocentrism should become the main route of sustainable development to promote a strong form of sustainability. Ecocentrism recognizes the intrinsic value of nature. The ecological and ecosystem understanding of nature should be in the center and human beings and the economy are part of nature. The ecological view challenges the current

²¹⁶ *ibid* 2425.

²¹⁷ *ibid* 2432–2433.

²¹⁸ Gillespie (n 212) 22.

²¹⁹ *ibid*.

²²⁰ *ibid* 33.

²²¹ *ibid*.

understanding of environmental law, which has developed the concept of “othering” nature.

There are different approaches to ecocentrism. In one approach, the ecological philosophy of law suggests “Earth Jurisprudence and Law for Nature”. The focus of Earth Jurisprudence is on the rights of nature.²²² Earth Jurisprudence criticizes that law should not consider nature as an object, nature and any natural resources like oceans and birds have rights as subjects.²²³ The central claim of Law for Nature is that ecological knowledge is a precondition of environmental law, which has a normative relation with science.²²⁴ Ecological normativity is the parameter whereby the adequacy of law can be assessed against the external bio-functional principle of “survival” or “ecological protection”.²²⁵ Ecological normativity has three elements: the normativity of limits, the normativity of uncertainty, and the normativity of ecological forms. The normativity of limits indicates that any law that violates the goal of ecological protection lacks the conditions of being a legal norm.²²⁶ The normativity of uncertainty denotes that science is not able to provide secure and neutral knowledge due to the complexity and dynamic nature of the ecosystem, hence, where there is uncertainty or risk, it is on the law to decide or solve the problem through the well-established precautionary principle.²²⁷ The normativity of ecological

²²² De Lucia (n 211) 168.

²²³ Earth Jurisprudence is explained by PD Burdon, *Earth Jurisprudence: Private Property and Earth Community* (PhD Thesis, Adelaide Law School, The University Of Adelaide, May 2011) cited in *ibid* 176.

²²⁴ Law for nature is explained by the Italian legal philosopher, Mariachiara Tallacchini, *Diritto per la Natura. Ecologia e Filosofia del Diritto* (Giappichelli Editore, Torino 1996) cited in *ibid*.

²²⁵ *ibid*.

²²⁶ *ibid* 177.

²²⁷ *ibid* 178.

forms (Gestalt) is the shift from the translation of ecological realities, atomistic forms, and natural objects to relational, systemic Gestalt, metaphysics, and ontology of law.²²⁸

This first approach, i.e. the Earth Jurisprudence and Law for Nature, was not selected as a methodology of this thesis as it probably has the most significant challenges in terms of social, economic, and legal transformations, requiring further research. In addition, Earth is dominated by human activities. Few places have not been adversely affected by human developments and no “wilderness” is left on Earth.²²⁹ Furthermore, this approach requires fundamental shifts and redefinitions of established property rights. Such redefinitions are difficult in light of complexities in the socio-economic structures. This translation is also difficult because while the focus of ecology is on the objects and their relations, the focus of property ontology and legal language is on the relations and distinctions between subjects (owners) and objects (the owned).²³⁰

The second approach is the concept of intergenerational equity and the duty of beneficiaries to preserve the environment and natural resources for future generations.²³¹ Under this concept, the subject does not have dominance or ownership control over the object and will survive and pass from one generation to another generation, reconciling the subject and object because the subject uses the resources to satisfy needs, but with this limitation that intergenerational perspective must be considered.²³² Weiss has also theorized intergenerational equity and believes that each generation holds the planet and

²²⁸ *ibid* 179.

²²⁹ Peter Bridgewater, Rakhyun E Kim and Klaus Bosselmann, ‘Ecological Integrity: A Relevant Concept for International Environmental Law in the Anthropocene?’ (2014) 25 *Yearbook of International Environmental Law* 61, 75.

²³⁰ De Lucia (n 211) 178.

²³¹ *ibid*.

²³² *ibid* 180.

its resources in trust for future generations.²³³ Each generation has two roles: beneficiary and trustee. As a beneficiary, it holds certain rights to enjoy common patrimony, and as a trustee, it has certain obligations to conserve diversity, maintain quality, and provide equitable access to natural resources.²³⁴ Conserving diversity of resources means avoiding undue restriction of options so that future generations can meet their demands.²³⁵ Conservation of quality means the current generation should pass on the planet to the next generations in no worse condition than they received it.²³⁶ Conservation of access means equitable access for individuals of each generation and conservation of this access for future generations.²³⁷

This second approach, i.e. the duty of trust, was not selected as a methodology for this thesis due to the challenges it presents. Challenges include the priority of addressing inequalities between the present generation over future generations²³⁸, the unsecured interest of future generations in the decision-making processes, the lack of accountability of the present generation for their damage to the environment,²³⁹ and the difficulty in

²³³ Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony and Intergenerational Equity* (Transnational Publishers 1998) 21.

²³⁴ *ibid* 38.

²³⁵ *ibid*.

²³⁶ *ibid*.

²³⁷ *ibid*.

²³⁸ Nienke van der Have, 'The Right to Development: Can States Be Held Responsible?' in Foeken Foeken and others (eds), *Development and Equity* (Brill 2014) 207.

²³⁹ Sumudu A Atapattu, *Emerging Principles of International Environmental Law* (Transnational Publishers 2006) 116. Atapattu notes that other principles such as the principle of prevention, the environmental impact assessment, and the precautionary principle must be used to secure the interest of future generations and prevent any damage to future generations.

specifying a right holder or a representative of future generations.²⁴⁰ In addition, it does not offer much guidance on how a regulatory framework for OWE should be improved.

The third approach to ecocentrism is ecological sustainability in which ecological integrity is in the center. Integrity is a general concept, which means a valuable whole that is not impaired or diminished.²⁴¹ In scientific terminology, it is defined as ‘an ecosystem’s undiminished ability to continue its natural path of evolution, its normal transition over time, and its successional recovery from perturbations’.²⁴² This definition focuses on the quality of the ecosystem and its biota and the optimum structural capacity that reflects the system’s evolutionary history.²⁴³ Canada is among the countries that have used this term in the law. For example, the Canada National Parks Act defines ecological integrity:

With respect to a park, a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes.²⁴⁴

The Report of the Panel on the Ecological Integrity of Canada's National Parks also defines ecological integrity:

²⁴⁰ Edith Brown Weiss, ‘Our Rights and Obligations to Future Generations for the Environment’ (1990) 84 Am. J. Int’l L. 203. Weiss suggests that the rights of future generations should be regarded as group rights or possibly, we consider planetary obligations without corresponding rights for future generations. Lydia Slobodian, ‘Obligations to Transgenerational Groups: A Justification for Sustainable Environmental Policy’ (2012) 24 Geo Int’l Envtl L Rev 387.

²⁴¹ Laura Westra and others, ‘Ecological Integrity and the Aims of Global Integrity Project’ in David Pimentel, Laura Westra and Reed F Noss (eds), *Ecological Integrity: Integrating Environment, Conservation, and Health* (Island Press 2000) 20.

²⁴² Donald Brown and others, ‘Implementing Global Ecological Integrity: A Synthesis’ in David Pimentel and others (eds), *Ecological Integrity: Integrating Environment, Conservation, and Health* (Island Press 2000) 387.

²⁴³ *ibid* 387, 388.

²⁴⁴ The Canada National Parks Act, SC 2000, c 32, s 2(1).

An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes.²⁴⁵

The Oceans Act in clarification of one of the purposes of establishing protected areas defines ecological integrity as follows:

a condition in which (a) the structure, composition and function of ecosystems are undisturbed by any human activity; (b) natural ecological processes are intact and self-sustaining; (c) ecosystems evolve naturally; and (d) an ecosystem's capacity for self-renewal and its biodiversity are maintained.²⁴⁶

The definitions underscore the conservation of natural ecological structure, composition, function, and processes. In other words, the purpose of ecological integrity is to conserve native biodiversity and natural processes.²⁴⁷ Human activities should not disturb these natural features and should not undermine the four qualities that can be ascribed to ecological integrity: (1) "System health": the community functioning continues successfully; (2) Resilience: ecosystems can absorb stresses; (3) "Optimum capacity": greatest possible development options are sustained; and (4) Ongoing change: ecosystems can change and develop constantly and are not constrained by human interventions.²⁴⁸

Ecological sustainability concept enjoys support internationally as well. International non-binding agreements have considered humans as part of nature, and

²⁴⁵ Government of Canada Parks Canada Agency, 'Report of the Panel on the Ecological Integrity of Canada's National Parks' (1998) <https://parks.canada.ca/docs/pc/rpts/ie-ei/report-rapport_1> accessed 30 October 2024.

²⁴⁶ Oceans Act, SC 1996, c 31, s 35(1)(1.1).

²⁴⁷ Westra and others (n 241) 21.

²⁴⁸ Robert E Ulanowicz, 'Toward the Measurement of Ecological Integrity' in David Pimentel, Laura Westra and Reed F Noss (eds), *Ecological Integrity: Integrating Environment, Conservation, and Health* (Island Press 2000) 99.

conservation of nature as a prerequisite of development. For example, paragraph 2 of the World Conservation Strategy of 1980 states, ‘Among the prerequisites for sustainable development is the conservation of the living resources’.²⁴⁹ The World Charter for Nature adopted by UN General Assembly in 1983 also considered nature conservation as a prerequisite for the use of natural resources and development planning, regarded humans as part of nature, and stated that ‘every form of life is unique, warranting respect regardless of its worth to man’, and natural resources should be managed to ‘achieve and maintain optimum sustainable productivity’.²⁵⁰ Furthermore, Principle (I)(1)(a) of Earth Charter also states ‘all beings are interdependent and every form of life has value regardless of its worth to human beings’.²⁵¹ In addition, the Earth Charter also provides that it is necessary to ‘protect and restore the integrity of Earth’s ecological system, with special concern for biological diversity and the natural processes that sustain life’.²⁵²

This approach challenges the established view of sustainable development based on anthropocentrism and trade-offs between environmental, economic, and social interests. It holds that the benchmark is ecological integrity as the only social choice that cannot be compromised.²⁵³ In other words, development activities should not exceed the system’s resilience by causing irreversible changes, and the environmental ability should be

²⁴⁹ International Union for Conservation of Nature and Natural Resources (IUCN) and others, ‘World Conservation Strategy: Living Resource Conservation for Sustainable Development’ (1980) para 1 (2) <<https://portals.iucn.org/library/efiles/documents/wcs-004.pdf>>.

²⁵⁰ UN General Assembly, ‘World Charter for Nature’ (UN, 1982) A/RES/37/7 preamble (a) and I. General Principles, (1)(4) <<https://digitallibrary.un.org/record/39295>> accessed 11 November 2024.

²⁵¹ ‘The Earth Charter’ Principle (I)(1)(a) <https://earthcharter.org/wp-content/uploads/2020/03/echarter_english.pdf> accessed 11 November 2024.

²⁵² *ibid* Principle II (5).

²⁵³ Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (second edition, Routledge 2017) 29 & 30.

maintained despite the pressures and disturbances from human activities.²⁵⁴ Ecological integrity is not focused on the protection of individual species or endangered species but has broader concerns with the quantities of stocks and productivity as ecological integrity may be lost before the loss of biodiversity or species.²⁵⁵

This approach also considers the sustainability of Earth systems and holds that development activities should not surpass the boundaries of the ecological system to be qualified as sustainable.²⁵⁶ Based on scientific evidence, Earth has a self-regulating capacity that is determined by planetary biophysical subsystems or processes such as climate system, biosphere integrity, and biogeochemical flows.²⁵⁷ These systems have certain thresholds. If the thresholds are crossed, the functioning of the Earth system may be changed and changes in one may create changes in another system.²⁵⁸

The concept of planetary boundaries is also rooted in resilience theory which considers the Earth system as a complex, adaptive, and socio-ecological one.²⁵⁹ Earth is a self-regulated, self-organized, and resilient system that has the capacity to absorb shocks while maintaining its functions but within certain limits, hence, if those limits are crossed, Earth cannot recover itself.²⁶⁰ The Earth's resilience has been reduced over time due to

²⁵⁴ *ibid* 44.

²⁵⁵ Brown and others (n 242) 389.

²⁵⁶ Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (n 253) 25.

²⁵⁷ Rakhyun E Kim and Klaus Bosselmann, 'Operationalizing Sustainable Development: Ecological Integrity as a *Grundnorm* of International Law: Operationalizing Sustainable Development' (2015) 24 *Review of European, Comparative & International Environmental Law* 194, 196.

²⁵⁸ *ibid*.

²⁵⁹ *ibid*.

²⁶⁰ *ibid*.

anthropogenic pressures in a way that scientists suggest that climate system and biosphere integrity have been already crossed and other systems are under threat.²⁶¹

However, when it comes to determining development projects, it may not be appropriate to heavily rely on the limits, thresholds, or quantifiable points at which the acceptability of a development proposal is determined. There are significant uncertainties about the impacts of developments on ecosystems and their components and about whether ecosystems can be resilient and absorb shocks. It may not be suitable to rely on a “knife-edge approach” to resolve conflicts between environmental and economic considerations and determine projects in a legal framework that aims to ensure the preservation of ecosystems.²⁶² Such determination is not proper in light of the three characteristics of ecosystems. First, ecosystems, the interaction between the living components, and their resilience are complex and it is an oversimplification if a determination is made based on a quantifiable point or descriptors.²⁶³ Second, ecosystems are dynamic, evolving based on natural or human-induced changes, hence, it is not appropriate to reduce these processes to quantifiable criteria.²⁶⁴ Third, ecosystems are non-linear, which makes it hard to predict how ecosystems as a whole will react to the cumulative effects of different human activities.²⁶⁵ A further consideration is that an instrumental approach to presume and allow

²⁶¹ Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (n 253) 45; Kim and Bosselmann (n 257) 196; Will Steffen and others, ‘Planetary Boundaries: Guiding Human Development on a Changing Planet’ (2015) 347 *Science* 1259855.

²⁶² Olivia Woolley, *Ecological Governance: Reappraising Law’s Role in Protecting Ecosystem Functionality* (Cambridge University Press) 152.

²⁶³ *ibid* 161.

²⁶⁴ *ibid* 162.

²⁶⁵ *ibid*.

the economy to use resources up to a certain point is not aligned with the facts that environmental and economic realities cannot be fully predicted.²⁶⁶

In addition, it is also critical to determine what criteria should be used to define or measure ecological integrity. Selecting criteria depends on what approach is taken for defining ecological integrity. In one method, if “original integrity” or “wild nature” is considered as a baseline condition, the native biodiversity and ecological processes of an ecosystem are key in determining the ecological integrity of that ecosystem.²⁶⁷ In other words, the biological condition of an ecosystem is compared to baseline conditions of wild nature.²⁶⁸ The integrity is degraded if there is a positive or negative divergence from the baseline condition as a result of human activities (e.g. species loss and introduction of non-native species).²⁶⁹ The second method is “systemic integrity” to measure the organization, structural flows, vigor (organism’s ability to survive and perform well), and resilience.²⁷⁰

A challenge from a biology perspective is determining the spatial requirements to maintain native ecosystems. Some questions might arise: What areas are essential for ecological integrity or conserving native biodiversity and natural processes? How do external conditions surrounding a protected area influence it? What are the effective strategies to shield an area from negative external impacts? How do global and regional atmospheric and climatic conditions affect or contribute to local ecological integrity?²⁷¹

²⁶⁶ *ibid* 163.

²⁶⁷ Peter Miller and James W Ehnes, ‘Can Canadian Approaches to Sustainable Forest Management Maintain Ecological Integrity?’ in David Pimentel, Laura Westra and Reed F Noss (eds), *Ecological Integrity: Integrating Environment, Conservation, and Health* (Island Press 2000) 159.

²⁶⁸ Brown and others (n 242) 392.

²⁶⁹ Miller and Ehnes (n 267) 160.

²⁷⁰ Brown and others (n 242) 393; Miller and Ehnes (n 267) 159.

²⁷¹ Westra and others (n 241) 21.

The criteria for assessment and the scale of integrity assessment are important factors that should be considered in a regulatory framework.

Ecological integrity has also its unique characteristics, although it has a synergy with other concepts such as the ecosystem approach, sustainable development, and establishment of protected areas. For instance, ecological integrity overlaps with an ecosystem approach as it explores the human-environment interactions (i.e. human-induced impacts on ecosystems), but it offers additions because it aims to protect ecosystems at a level that protects ecological integrity.²⁷² Ecological integrity also shares normative elements with sustainable development as both of them require that development should not degrade the environment or that environmental considerations should be integrated into developing policies, which is necessary for ecological sustainability.²⁷³ Ecological sustainability has a central argument i.e. it is the core component, prerequisite, and the only way to sustainable development while social justice and economic prosperity are secondary concerns.²⁷⁴ In addition, ecological integrity establishes environmental protection goals, which should not be undermined by development activities, and guides how conflicts between environmental and development goals should be resolved.²⁷⁵

The precautionary principle also aligns with ecological integrity and serves a complementary role, although it is not a settled principle due to the challenges in its definition and application. For example, there are uncertainties as to the definition and spectrum of the precautionary principle, which may make its application for the protection

²⁷² Brown and others (n 242) 388.

²⁷³ *ibid* 388, 389.

²⁷⁴ Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (n 253) 21 & 30.

²⁷⁵ Brown and others (n 242) 389.

of the integrity of ecosystems fuzzy. It is not clear what level of potential harm or damage is sufficient to trigger the application of this principle. Principle 15 of the Rio Declaration, which provides the most commonly used definition of the precautionary principle, sets a triggering point high as it requires “threats of serious or irreversible damage” for the application of this principle. It states that

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Furthermore, the terms used in this Principle such as “according to their capabilities”, “threats of serious or irreversible damage”, and “cost-effective measures” make the application of this principle soft and add to its uncertainties.²⁷⁶

It is also uncertain or a contextual question that how the precautionary principle applies to specific subjects. For instance, in some cases such as nuclear technology, this principle may lead to prohibition, and in other cases such as chemical substances, it may lead to pollution prevention or waste minimization.²⁷⁷ It may have indirect implications of requiring EIA for projects, plans, and policies.²⁷⁸

However, in the context of ecological integrity and natural resources management, the precautionary principle has a broad application of precaution in decision-making.²⁷⁹

²⁷⁶ David Vanderzwaag, ‘The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides’ (2002) 33 *Ocean Development & International Law* 167.

²⁷⁷ *ibid* 168.

²⁷⁸ *ibid*.

²⁷⁹ IUCN Council, ‘Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management’ Introduction and Guideline 1 <<https://www.monachus-guardian.org/library/iucn07a.pdf>> accessed 13 December 2024.

This principle is particularly helpful when there is a conflict between the objective of reducing GHG emissions under the climate change regime through the development of OWE and the objective of conserving the ecological integrity of a site. For example, a marine protected area may be established to maintain the ecological integrity of an ecosystem. Suppose that a proponent proposes an OWE project in that area or in the vicinity of that area. Due to the likely adverse effects of OWE on the conservation objectives and integrity of that area, an interpretation of the precautionary principle may require that such activity be automatically excluded at the planning stage in cases where marine protected areas or their buffer zones are involved. This interpretation is consistent with a strong form of ecological integrity, which requires the conservation of native biodiversity and natural processes. A less stringent interpretation is that if the project may have “significant adverse effects” on the management objectives of the site, it must be subject to an assessment process and, after assessment, if it is concluded that the project has “an adverse effect” on the integrity of the protected area, that project must not be authorized. For instance, Article 6(3) of the Habitats Directive provides that if a plan or project, individually or in combination with other plans or projects, has a significant effect on the management plans of a special area of conservation, an appropriate assessment must be conducted in view of the site’s conservation objectives.²⁸⁰ If a project or a plan will not adversely affect the integrity of the site, after obtaining the public’s opinion, the authority will agree to the plan or project.²⁸¹ With respect to the interpretation of this provision of the Directive, the European Court of Justice in a landmark case *Waddenzee* exercised the precautionary

²⁸⁰ Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora [1992] OJ L 206/7, art 6(3).

²⁸¹ *ibid.*

principle about the mechanical fishing of cockles in a special area of conservation in the Netherlands Wadden Sea. It held that in case of doubt as to the absence of significant effects, such an assessment must be undertaken to ensure that a project or a plan that adversely affects a site's integrity is not authorized.²⁸² According to this Court, the activity can be authorized only 'where no reasonable scientific doubt remains as to the absence of such effects'.²⁸³ This reasoning was further confirmed by another ruling of the European Court of Justice, which involved the adverse effects of road developments in a special area of conservation. This more recent ruling expressly stated that the assessment carried out under Article 6(3) of the Habitats Directive 'cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned'.²⁸⁴ The European Court of Justice also added that authorities cannot permit projects that may create "lasting harm to the ecological characteristics of sites" that contain priority habitat types or may cause "the disappearance or the partial and irreparable destruction" of a priority natural habitat type because such a permit will adversely affect the integrity of that site.²⁸⁵

One may argue that these two cases are not applicable to the conflict between climate objectives and ecological integrity. These cases are related to the mechanical fishing of cockles and road development while the conflict created by the development of

²⁸² *Case C-127/02 Landelijke Vereniging Tot Behoud van de Waddenzee and Nederlandse Vereniging Tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer En Visserij* [2004] ECR I-7405, para 44.

²⁸³ *ibid* para 59.

²⁸⁴ *Case C-258/11 Peter Sweetman and Others v An Bord Pleanála* [2013] General, para 44.

²⁸⁵ *ibid* paras 43 and 46.

OWE is different as it benefits ecosystems. Reducing the causes and effects of climate change is helpful for ecosystems and the marine environment.²⁸⁶ It is even suggested that in some cases, mitigating GHG emissions can be compatible with other environmental objectives, and in case of conflict, such conflicts can be resolved by operationalizing an integrated system of governance.²⁸⁷ In addition, climate change law and environmental law share common grounds of environmental protection, and climate change law has implications for other sub-areas of environmental law such as air pollution, biodiversity law, and water law.²⁸⁸

Nonetheless, if renewable energy is selected as a policy choice to achieve climate change mitigation objectives, there might be inevitable cases of conflict between this choice and the achievement of ecological objectives. As will be explained in this thesis, the ecological impacts of OWE can be reduced in some cases by improving the regulatory framework and use of different tools such as planning (e.g. MSP), SEA, and EIA. However, there are cases where impacts are inevitable due to pressure from energy demand or energy security²⁸⁹ or due to the complex, dynamic, and non-linear nature of the marine environment and the involved effects. One may argue that this hard choice is a political

²⁸⁶ 'Climate Change 2014: Synthesis Report' (Intergovernmental Panel on Climate Change 2015) 13. The report states scenarios that due to climate change, a significant number of species will face extinction risk, most plant species will not be able to shift naturally, marine organisms and mammals will encounter lower oxygen and higher ocean acidification, and coral reefs will be at risk because of sea level rise.

²⁸⁷ Roger Hildingsson and Bengt Johansson, 'Governing Low-Carbon Energy Transitions in Sustainable Ways: Potential Synergies and Conflicts between Climate and Environmental Policy Objectives' (2016) 88 *Energy Policy* 245.

²⁸⁸ C Hilson, 'It's All About Climate Change, Stupid! Exploring the Relationship Between Environmental Law and Climate Law' (2013) 25 *Journal of Environmental Law* 359, 369.

²⁸⁹ Olivia Woolley, 'Climate Law and Environmental Law: Is Conflict between Them Inevitable?' in Benoit Mayer and Alexander Zahar (eds), *Debating Climate Law* (1st edn, Cambridge University Press 2021) <https://www.cambridge.org/core/product/identifier/9781108879064%23CT-bp-7/type/book_part> accessed 12 November 2024.

task²⁹⁰ or it is mainly a matter of trade-off.²⁹¹ However, in these cases, the application of the precautionary principle in light of the reasoning of the above-mentioned European Court of Justice’s ruling could be helpful to advance environmental objectives. In other words, if a shared objective of climate change law and ecological law is to protect the environment, OWE developments should not undermine the ecological integrity of ecosystems. It is questionable how the ecological integrity of a protected area or a relevant ecosystem can be protected by the positive climate effects of OWE development while this development may have direct impacts on marine ecosystems.

Turning back to the application of ecological sustainability in a legal framework, it should be noted that the application of this approach may face broad challenges. First, if ecological sustainability should be applied broadly, the major flaw in the law is that it does not have a fundamental rule prohibiting harm to ecosystem integrity.²⁹² In particular, as discussed above, the current Canadian law has limited references to ecological integrity as the central principle. Recognizing this rule requires that sustainability is accepted as an “overarching ethical and legal principle”.²⁹³ Secondly, the social and economic structures are embedded in exclusive property rights.²⁹⁴ Modern civilization from the Industrial Revolution onward has been shaped by shifting away from commons to property rights, which makes it challenging to imagine how sustainable development can be achieved if no

²⁹⁰ Hildingsson and Johansson (n 287) 250.

²⁹¹ Alexandros Gasparatos and others, ‘Renewable Energy and Biodiversity: Implications for Transitioning to a Green Economy’ (2017) 70 *Renewable and Sustainable Energy Reviews* 161–184.

²⁹² Klaus Bosselmann, ‘The Framework of Ecological Law’ (2020) 50 *Environmental Policy and Law* 479, 479; Bosselmann, ‘Losing the Forest for the Trees’ (n 210) 2425.

²⁹³ Bosselmann, ‘Losing the Forest for the Trees’ (n 210) 2425.

²⁹⁴ Bosselmann, ‘The Framework of Ecological Law’ (n 292) 480.

major changes are made to the current systems.²⁹⁵ Thirdly, laws are fragmented and do not consider the environment as a “whole” but set rules to use “natural resources”.²⁹⁶ This fragmentation and lack of recognition of the “whole” environment or its integrity as an asset is a challenge that has serious consequences.²⁹⁷

Furthermore, a fully designed governance based on ecological sustainability requires substantial moral, social, economic, legal, and political changes. For example, the prerequisite of this transformation has been viewed as a covenant that declares the responsibility for the community of life and agrees in the ‘framework of social and economic systems and legal and political structures’.²⁹⁸ Ecological sustainability should be based on a fundamental ethical and legal principle that is prohibiting harm to the integrity of ecosystems should be the fundamental legal rule.²⁹⁹ The purpose of the governance also needs to be redefined from the current anthropocentric well-being and economic rationality to a governance based on ecological integrity.³⁰⁰ This redefinition needs consciousness about the current “social and ecological blindness of property rights” and reorganizing the legal system around sustainability.³⁰¹ The legal systems globally should also recognize the Earth trusteeship, the rights of nature, and the duty to protect the Earth’s ecological system.³⁰²

²⁹⁵ *ibid* 481.

²⁹⁶ Bosselmann, ‘Losing the Forest for the Trees’ (n 210) 2432.

²⁹⁷ *ibid*.

²⁹⁸ Klaus Bosselmann, ‘The Way Forward: Governance for Ecological Integrity’ in Laura Westra, Klaus Bosselmann and Richard Westra (eds), *Reconciling Human Existence with Ecological Integrity* (Earthscan 2008) 323.

²⁹⁹ Bosselmann, ‘The Framework of Ecological Law’ (n 292) 479.

³⁰⁰ Bosselmann, ‘The Way Forward: Governance for Ecological Integrity’ (n 298) 324.

³⁰¹ Bosselmann, ‘The Framework of Ecological Law’ (n 292) 481.

³⁰² *ibid* 483.

This large-scale and global transformation in systems and structures is not within the scope and purpose of this thesis but this thesis is guided by ecological sustainability in the context of OWE in various ways.³⁰³ First, ecological sustainability advises that as a result of the fragmentation of environmental laws and the focus of each law on a specific aspect of the environment, the value of the whole environment should not be missed.³⁰⁴ For this reason, the formation of policies, plans, and laws should result from a holistic, integrated, and coordinated approach, not a sectoral approach to ensure that the whole or the integrity of relevant ecosystems is not fundamentally and irreversibly damaged due to the impacts of OWE. The laws and policies related to integrated planning through the process of MSP, impact assessment, and more specific laws for different ecosystem components (e.g. migratory birds) are among the critical areas that should be considered in an appropriate regulatory framework of OWE. In addition, integrated management, SEA, EIA, and MSP which are informed by biodiversity-related knowledge should be developed and undertaken to support the inherent purpose of an all-inclusive perspective toward ecosystems and a holistic approach to the sustainable development of OWE.

Second, ecological sustainability also offers guidance that a regulatory system for OWE should be directed towards the inclusion of ecological integrity. For instance, the definition of ecological integrity informs that the impacts of OWE should not diminish or impair the natural path of evolution and the normal transition of ecosystems. The structure, composition, and function of ecosystems should not be disturbed by OWE activities, natural processes should be sustained, and ecosystems' biodiversity should be maintained.

³⁰³ To the best of the author's knowledge, the application of ecological sustainability as a theoretical framework in the context of OWE is a novel approach that has not been adopted in the existing literature.

³⁰⁴ Bosselmann, 'Losing the Forest for the Trees' (n 210) 2432.

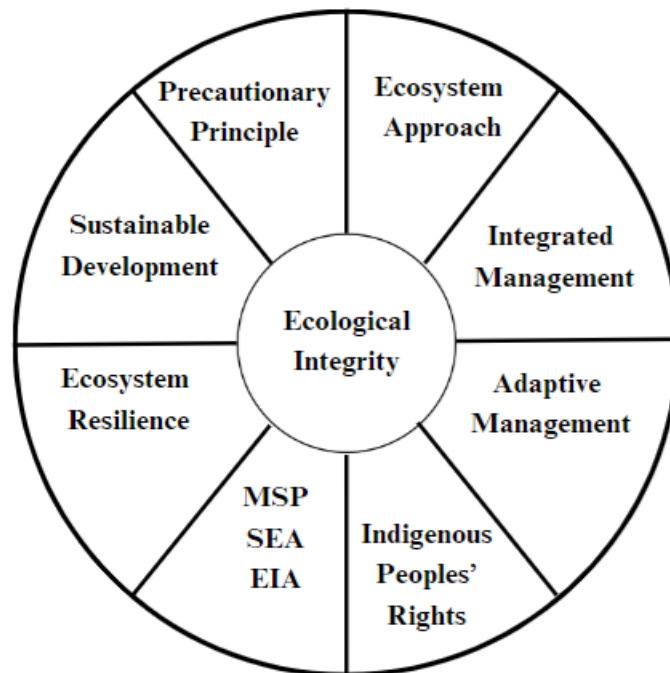
In other words, OWE activities should not harm the successful processes and functioning of communities, and in case of harm by OWE activities, ecosystems should be able to absorb them. Therefore, prohibiting harm to ecological integrity should be widely applied in the regulatory framework.

Third, ecological sustainability concerns ecological consciousness and how we define our relationship with the environment. This ecological consciousness cannot be achieved without raising our ecological knowledge. Such consciousness facilitates the interdisciplinary communication between law and ecology, which is fundamental in reaching a concrete construction of how the law should respond to the ecological impacts of OWE.

Fourth, the law should conserve the integrity of ecosystems from human activities. This integrity should be preserved by reigning the pressure exerted by human activities on ecosystems and setting limits by regulations. Boundaries or limits for OWE activities should be set at national, regional, and local scales based on the pertinent ecological conditions. For example, the boundaries set for ecosystem management or conservation of protected areas/species through objectives and plans should not be undermined by the development of OWE.

Finally, it should be noted that ecological sustainability is a comprehensive theoretical framework essential for analyzing the regulatory framework of OWE. This framework offers a critical perspective to evaluate the effectiveness of the existing regulatory framework of OWE in addressing the environmental impacts. By examining ecological sustainability and its relation to ecological integrity in this section, the following designed chart illustrates the intricate relationship between ecological sustainability and

ecological integrity, highlighting how these concepts and other principles and approaches are interconnected and interplay (Figure 2). The chart below illustrates that ecological integrity is fundamental to achieving ecological sustainability as any damage to ecological integrity should be prohibited by the rule of law. The concepts, principles, approaches, and practical tools discussed in this section, as well as those that will be addressed throughout this thesis, either complement or synergize with ecological integrity. These concepts, principles, approaches, and practical tools include ecosystem resilience, sustainable development, the precautionary principle, the ecosystem approach, integrated management, adaptive management, stakeholder engagement, MSP, SEA, and EIA.



**Figure 2- Ecological Sustainability
Theoretical Framework for OWE**

With guidance from this theoretical framework, it is necessary to understand the possible environmental impacts of OWE and examine the effectiveness of how the fragmented laws and policies have responded to regulating the impacts.

CHAPTER TWO- THE LIKELY ECOLOGICAL IMPACTS OF OWE AND THE POSSIBLE CHALLENGES OF OWE FOR STAKEHOLDERS

Framing law based on ecological sustainability requires transcending the normal limits of legal thinking. This change of perception requires exploring the current scientific knowledge related to the impacts of the development of OWE on ecosystems, and the challenges that this development may impose on marine uses. Creating a dialogue between law and science regarding the ecological and cross-sector impacts of OWE will aid in acknowledging the issues it creates and in bridging the gap between science and law. This will also help in critiquing the relevant laws applicable to these problems.

This chapter focuses on the impacts of the construction and operation phases.³⁰⁵ Although there are some references to the impacts of decommissioning of OWE, this thesis does not provide details about it because significant experience has not been developed in this regard. Current evidence suggests that partial decommissioning is more likely due to positive ecological effects (subject to conducting EIA), and the fact that full decommissioning has similar effects as the construction of OWE.³⁰⁶

To understand and identify the impacts of OWE, this chapter is categorized into four sections. The first section will discuss the likely impacts of OWE on ecosystems, including different kinds of communities, and their structures, functioning, and processes. The second and third sections will identify the possible challenges of the development of OWE on key stakeholders. The fourth section will unlock some of the cumulative effects of OWE and finally, the fifth section will provide conclusions.

³⁰⁵ The OWE projects normally have construction, operation, and decommissioning phases.

³⁰⁶ R Hall, E Topham and E João, 'Environmental Impact Assessment for the Decommissioning of Offshore Wind Farms' (2022) 165 *Renewable and Sustainable Energy Reviews* 112580.

2.1 The Likely Ecological Impacts of OWE

2.1.1 Technical Parts of OWE

Wind turbines comprise different parts: the foundation, the tower, the rotor, and hub (including blades), the nacelle, the generator, and cables. The generated electricity from offshore wind turbines needs to be aggregated through individual turbines by “inter-array cables” (i.e. cables connecting turbines) and transmitted through “export cables” to onshore facilities.³⁰⁷ Cables are usually placed beneath the seabed surface, shielding them from damage that might arise from the natural movement of sediments, fishing gear, or ship anchors.



Figure 3

Offshore wind foundation types

Left to right: Monopile, jacket, twisted tripod, floating semi-submersible, floating tension leg platform, and

³⁰⁷ U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER), ‘Electromagnetic Field Effects on Marine Life’ (2022) 1
<http://www.crmc.ri.gov/meetings/2022_1213semipacket/SEER_EMF_MarineLife.pdf> accessed 4 September 2023.

OWE foundations also have different types that are used based on different factors. They include monopile, jacket, tripod, tri-pile, jack-up, suction bucket, gravity, and floating foundations (Figure 3).³⁰⁸ There are various factors involved in selecting what type is suitable for a specific location in the marine environment. The contributing factors to making this selection are water depth, the installation methods, the type of seabed (sandy or rocky), the wind load (the wind pressure exerted on the sides of installations), hydrodynamic load (flow of water against and around the foundation), and environmental impacts.³⁰⁹

The characteristics and various types of foundations are discussed in this section to understand the technical limitations of each foundation and their suitability based on the seabed types.

- i) Most OWE projects use monopile foundations³¹⁰, which are favorable for a maximum water depth of 50 meters (160 feet) and sandy seabeds, but not suitable for shallow bedrock seabed conditions or strata with boulders, cobbles, or coarse gravel.³¹¹
- ii) Jacket foundations, which are used for waters below 60 meters (200 feet), are normally preferred for stiff clays and medium to dense sands, but they are not well for places where there are many boulders.³¹²

³⁰⁸ Sarah Horwath and others, ‘Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations’ (US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs 2020) 2
<<https://www.boem.gov/sites/default/files/documents/environment/Wind-Turbine-Foundations-White%20Paper-Final-White-Paper.pdf>> accessed 3 August 2023.

³⁰⁹ *ibid* 1.

³¹⁰ *ibid* 4.

³¹¹ *ibid* ES-2.

³¹² *ibid*.

- iii) Suction jackets are usually used for locations with medium stiff clays, but they are not favorable for locations with boulders, cobbles, or coarse gravel.³¹³
- iv) Tripod foundations are suitable for waters below 50 meters (160 feet) and geological conditions similar to jacket foundations.³¹⁴
- v) Tri-pile foundations are installed in waters with a maximum depth of 40 meters (130 feet). They are favorable for seabed consisting of sand and clay, but they are not suitable for shallow bedrock or locations with boulders, cobbles, or coarse gravel.³¹⁵
- vi) Jack-up foundations are located in waters below 100 meters (330 feet) and are preferred for hard bottom areas and where there are stiff clays and medium-to-dense sands.³¹⁶ It is also possible to install them in soft clay or where the stiff soil is covered by soft sediments.³¹⁷
- vii) Suction bucket foundations are installed in the waters whose depth is a maximum of 30 meters (100 feet).³¹⁸ They are suitable for medium stiff clay and fine to medium sand, but not for locations with boulders, cobbles, coarse gravel, or very soft soils.³¹⁹
- viii) Gravity foundations are preferred for waters with a maximum depth of 30 meters (100 feet).³²⁰ They are suitable for various types of seabed conditions

³¹³ *ibid.*

³¹⁴ *ibid.*

³¹⁵ *ibid.*

³¹⁶ *ibid.*

³¹⁷ *ibid.*

³¹⁸ *ibid.*

³¹⁹ *ibid.*

³²⁰ *ibid.*

such as medium stiff clays and areas with boulders, cobbles, or coarse gravel, but they are not suitable for areas with very soft soil or weak clays.³²¹

- ix) Floating foundations are designed to be installed in deep waters of up to 220 meters (720 feet).³²² They can be placed in seabed areas with medium stiff clays, fine to medium sands, coarse sands, and gravel, but they are not very suitable for locations with many boulders.³²³

To protect the foundations from scouring, there are various scour protection systems placed around the foundations in OWE. Scouring occurs around OWE foundations when foundations are placed on the soft-bottom seabed. It is created due to the hydrodynamic forces such as currents, tides, and waves that pass the vertical part of the foundations, causing erosion or removal of sediments in the vicinity of the foundations and damaging the foundations' stability.³²⁴ The protective systems include 'dumped stone riprap, stone or concrete pitching, soil-cement bagging or grouted fabric mattress'.³²⁵ Scour protection is a part of construction, which, together with foundations, creates hard-bottom habitats for marine species.

Different parts of OWE may have ecological impacts. The upper parts such as the tower and blades may affect the avian communities. They have different types: diving

³²¹ *ibid.*

³²² *ibid.*

³²³ *ibid.*

³²⁴ JH den Boon and others, 'Scour Behaviour and Scour Protection for Monopile Foundations of Offshore Wind Turbines' 2 <https://www.researchgate.net/profile/James-Sutherland/publication/228691951_Scour_behaviour_and_scour_protection_for_monopile_foundations_of_offshore_wind_turbines/links/54db3c0c0cf2ba88a68f7ee5/Scour-behaviour-and-scour-protection-for-monopile-foundations-of-offshore-wind-turbines.pdf> accessed 8 August 2023.

³²⁵ Clara Matutano and others, 'Scour Prediction and Scour Protections in Offshore Wind Farms' (2013) 57 *Renewable Energy* 358.

seabirds, surface-feeding seabirds, and sea ducks that hunt fish or invertebrates.³²⁶ Foundations installed in marine areas may also have various ecological impacts on marine communities. Benthic communities might be affected by OWE. Benthic communities are classified based on the conditions of seabeds into two types. The first type is soft-bottom benthic communities that live in soft-bottom seabeds, made of sands, sediments, and mud.³²⁷ The communities in these areas are plants, algae, worms, clams, sea snails, and groundfish (such as haddock) that live near seabeds and are called demersal fish.³²⁸ The second type is hard-bottom benthic communities that live in rocky and hard substrates and include algae, worms, crabs, mussels, and fish that are attracted to gobies and black seabass.³²⁹ In addition, pelagic communities might be affected by OWE. Pelagic communities include various organisms such as phytoplankton, zooplankton, fish, invertebrates, marine mammals, and sea turtles.³³⁰

2.1.2 Ecological Changes Due to the Introduction of Hard-bottom Substrata

Construction of OWE foundations and scour protections causes ecological effects. On the one hand, it includes various activities such as dredging, sediment displacement, pile driving, and cable laying, which can affect the ecosystem by killing, crushing, or smothering species. On the other hand, it causes the loss of soft-bottom habitats and the creation of hard-bottom habitats. Soft-bottom habitat loss can affect marine mammals and seabirds. For example, marine whales and scoters will be affected because whales use these

³²⁶ Horwath and others (n 308) 17.

³²⁷ *ibid.*

³²⁸ *ibid.*

³²⁹ *ibid.*

³³⁰ *ibid.*

habitats to feed on infauna and epifauna, and scoters use them to feed on benthic invertebrates.³³¹ Despite these losses, the new hard-bottom habitats introduce new ecological effects, which may have both positive and negative effects, which are discussed in the sections below.

2.1.2.1 Artificial Reef Effects

Establishing OWE foundations and scour protections creates new habitats below the sea surface, causing artificial reef effects and changes in structures, processes, and functioning of ecosystems. The new habitats change ecosystem structure as they are rapidly colonized by sessile fauna. Biomass is concentrated on the OWE foundations, and blue mussels become the dominant species on the foundations.³³² Hard substrata, including OWE, are normally colonized by assemblages of suspension-feeding organisms such as sessile invertebrates and mussels, which are called “fouling communities”.³³³ Suspension feeders capture and digest particles such as phytoplankton, zooplankton, bacteria, and detritus.³³⁴ The blue mussels filter and clear bodies of water, and amphipods capture particles from water.³³⁵ They also influence the structure of benthic and pelagic food webs.³³⁶

³³¹ *ibid* 19.

³³² Roland Krone and others, ‘Epifauna Dynamics at an Offshore Foundation – Implications of Future Wind Power Farming in the North Sea’ (2013) 85 *Marine Environmental Research* 1.

³³³ Brian T Hentschel and Jeff Shimeta, ‘Suspension Feeders’, *Encyclopedia of Ecology* (Elsevier 2019) 628.

³³⁴ *ibid* 624.

³³⁵ *ibid*; Steven Degraer and others, ‘Offshore Wind Farm Artificial Reefs Affect Ecosystem Structure and Functioning: A Synthesis’ (2020) 33 *Oceanography* 48, 52.

³³⁶ Hentschel and Shimeta (n 333) 624.

Ecosystems might benefit from the introduction of OWE in marine areas or cause negative effects. OWE may act as no-trawling zones³³⁷ or marine protected areas.³³⁸ OWE projects prohibit or limit trawling within them and in the safety zone designated around them to avoid any safety issues such as entanglement of fishing gear.³³⁹ OWE helps different types of fish (e.g. juvenile or older) grow or survive, leading to more production and spillover effects.³⁴⁰ Such an effect, however, might impose a negative impact on the areas surrounding wind farms, where there is no limit for fishing, causing pressure on those areas.³⁴¹

OWE construction may also increase the quantity of hard-bottom species, which cannot be seen in natural hard bottoms.³⁴² This effect is based on a study on offshore artificial constructions, including platforms and wind foundations, in the southeastern North Sea. The suspension feeders, which are seen in great amounts on water columns, remove suspended particles from the water and provide abundant food for predators, changing the food net in the areas in the vicinity of the constructions.³⁴³ However, the effect of these changes on the matter and energy and biogenic reefs is not known yet.³⁴⁴

OWE might also create new habitats that attract benthos, demersal fish, benthopelagic fish, and decapods.³⁴⁵ On the attraction effect, a distinction is made between

³³⁷ Olivia Langhamer, 'Artificial Reef Effect in Relation to Offshore Renewable Energy Conversion: State of the Art' (2012) 2012 *The Scientific World Journal* 2 & 3. These zones are established to exclude trawling, fisheries, or other types of fishing for fisheries management and protection of biodiversity.

³³⁸ *ibid.*

³³⁹ *ibid.*

³⁴⁰ *ibid* 3.

³⁴¹ *ibid.*

³⁴² Krone and others (n 332) 10.

³⁴³ *ibid.*

³⁴⁴ *ibid.*

³⁴⁵ Degraer and others (n 335) 49.

different types of fish that are attracted to OWE. Some species such as Atlantic cod, *Trisopterus luscus*, and Arctic sculpin are attracted to predate biofouling communities for longer periods.³⁴⁶ Some species such as Atlantic horse mackerel are infrequently attracted to predate biofouling communities.³⁴⁷ Some species such as Atlantic mackerel are attracted not for food but for shelter.³⁴⁸ The scour protection can increase the density of decapods (e.g. crabs, lobsters, crayfish, shrimp, and prawns) as well.³⁴⁹ The attraction, abundance of fish, and the survival of big fish are the positive effects, contributing to a “spillover” to surrounding areas.³⁵⁰

It is, however, debatable whether the created habitats only attract fish, or they can contribute to the production of fish. The discourse is known as the “attraction-production debate”, which talks about the uncertainty of population benefits in local and regional areas.³⁵¹ The additional consequence of this change in habitats is that fish are attracted to an “ecological trap” where the quality of habitat is less than what is naturally selected based on some “ecological cues”.³⁵² While the attraction production resembles an equal or improved quality, the ecological trap issue indicates a deteriorated condition.³⁵³ An ecological trap may also mean more efficient hunting by predators such as birds and

³⁴⁶ *ibid* 54.

³⁴⁷ *ibid*.

³⁴⁸ *ibid*.

³⁴⁹ *ibid* 49.

³⁵⁰ Langhamer (n 337).

³⁵¹ JT Reubens, S Degraer and M Vincx, ‘The Ecology of Benthopelagic Fishes at Offshore Wind Farms: A Synthesis of 4 Years of Research’ (2014) 727 *Hydrobiologia* 121, 122; Jacqueline Wilson and others, ‘Artificial Reefs, the Attraction-Production Issue, and Density Dependence in Marine Ornamental Fishes’ (2001) 3 *Aquarium Sciences and Conservation* 95.

³⁵² Reubens, Degraer and Vincx (n 351) 122.

³⁵³ *ibid*.

mammals and adverse effects on prey populations, leading to a decrease in some benthic prey items.³⁵⁴

2.1.2.2 Change in the Compositions of Species

Changes in habitats may have impacts on the abundance and composition of species. The ecological impacts of the differences between habitats in artificial structures and natural reefs are not fully understood.³⁵⁵ However, the comparison between fouling assemblages on OWE foundations with adjacent hard substrates shows significant differences in the assemblage composition of epifauna and motile invertebrates and the number of some species.³⁵⁶ A comparison study of two wind farms off the coast of Sweden, central Baltic Sea, with surrounding areas shows that the abundance of fish communities in the vicinity of turbines is greater, but the species richness and diversity are similar to the surrounding areas.³⁵⁷ On the other hand, fish community structure was different on the monopiles, and fish abundance was greater than in the surrounding seabed, while species diversity was lower than in the surrounding seabed.³⁵⁸

2.1.2.3 The Potential Cumulative Effects of Large-scale Expansion of Hard-bottom Habitats

The effects of OWE projects on marine ecosystems depend on the characteristics of OWE projects. The size of the change in habitats can be different based on the number

³⁵⁴ Dan Wilhelmsson, 'Effects of Altered Habitats and Fishing Practices in Wind and Wave Farms' (2013) <<https://ir.library.oregonstate.edu/downloads/gt54kn91h?locale=en>> accessed 19 August 2023; English and others (n 204) 9.

³⁵⁵ Dan Wilhelmsson and Torleif Malm, 'Fouling Assemblages on Offshore Wind Power Plants and Adjacent Substrata' (2008) 79 *Estuarine, Coastal and Shelf Science* 459.

³⁵⁶ *ibid*; Krone and others (n 332).

³⁵⁷ Dan Wilhelmsson, Torleif Malm and Marcus C Öhman, 'The Influence of Offshore Windpower on Demersal Fish' (2006) 63 *ICES Journal of Marine Science* 775.

³⁵⁸ *ibid*.

of projects, the number and types of foundations, and the magnitude of deployed scour protection. The change in habitats can be less than one percent of the total area of the wind farm site and in some cases (e.g. in the case of gravity-based foundations), it can be up to seven percent.³⁵⁹ If OWE occupies a small part of the whole soft-bottom habitats, the impacts on marine mammals and seabirds due to the loss of their habitats may be minimal.³⁶⁰

Nonetheless, the “small-scale changes” can be the basis of “large-scale changes”. The immediate and short-term effects related to the loss of habitats and artificial reef effects may be minor, but they can guide the potential regional impacts, and particularly, the impacts on ecosystem services (e.g. fish stocks).³⁶¹ For example, a modeling study shows that the high quantity of filter feeders on the structure of OWE can reduce the pelagic primary productivity and moderately affect ecosystem functioning on a scale greater than 50km in the southern North Sea.³⁶² Therefore, careful consideration is needed to understand the effects of OWE projects on marine ecosystems.

The type of foundation selected for a wind farm is also a contributing factor in the size of the habitat loss. The bigger the size of the foundation, the greater the loss of habitats would be.³⁶³ The gravity, monopile, and suction jacket foundations, which have bigger

³⁵⁹ English and others (n 204) 190; Kenneth Peire, Hendrik Nonneman and Eric Bosschem, ‘Gravity Base Foundations for the Thornton Bank Offshore Wind Farm’ (2009) 115 *Terra et Aqua* <https://www.researchgate.net/publication/265627871_Gravity_Base_foundations_for_the_Thornton_Bank_offshore_wind_farm> accessed 8 August 2023.

³⁶⁰ Horwath and others (n 308) 19.

³⁶¹ Thomas A Wilding and others, ‘Turning off the DRIP (“Data-Rich, Information-Poor”) – Rationalising Monitoring with a Focus on Marine Renewable Energy Developments and the Benthos’ (2017) 74 *Renewable and Sustainable Energy Reviews* 848; Degraer and others (n 335) 54.

³⁶² Kaela Slavik and others, ‘The Large Scale Impact of Offshore Wind Farm Structures on Pelagic Primary Productivity in the Southern North Sea’ (9 May 2018) 1 & 12 <<http://arxiv.org/abs/1709.02386>> accessed 18 August 2023.

³⁶³ Horwath and others (n 308) 19.

sizes, have greater impacts in terms of habitat loss compared to the tri-pile, tripod, jack-up, jacket, and floating foundations.³⁶⁴

Furthermore, one of the cumulative effects is that the introduction of man-made structures to the marine environment causes “ocean sprawl”. This term refers to the spread and domination of various artificial structures such as piers, oil and gas platforms, seawalls, and marine renewable energy installations in the marine environment.³⁶⁵ This phenomenon modifies marine ecosystems and may alter ecological connectivity — ‘the movement of organisms, materials, and energy between habitat units within seascapes’.³⁶⁶ In other words, man-made structures add barriers to the movement of organisms, modify and cause fragmentation of habitats, and change trophic (i.e. feeding) connectivity.³⁶⁷ Consequently, such alterations may have impacts on the ecological structure, functioning, size, population, and distribution of species.³⁶⁸

The introduction of invasive species is another adverse effect of creating artificial hard substrates in OWE. The created hard-bottom areas act as new habitats for invasive species.³⁶⁹ An invasive species is defined as ‘one that arrives (often with human assistance) in a habitat it had not previously occupied, then established a population and spreads

³⁶⁴ *ibid.*

³⁶⁵ Melanie J Bishop and others, ‘Effects of Ocean Sprawl on Ecological Connectivity: Impacts and Solutions’ (2017) 492 *Journal of Experimental Marine Biology and Ecology* 7; Maria Glarou, Martina Zrust and Jon C Svendsen, ‘Using Artificial-Reef Knowledge to Enhance the Ecological Function of Offshore Wind Turbine Foundations: Implications for Fish Abundance and Diversity’ (2020) 8 *Journal of Marine Science and Engineering* 333.

³⁶⁶ Glarou, Zrust and Svendsen (n 365) 7.

³⁶⁷ *ibid.*

³⁶⁸ *ibid.*

³⁶⁹ Langhamer (n 337) 3.

autonomously'.³⁷⁰ OWE foundations remove natural barriers, create new habitats, and cause the introduction of invasive species. More specifically, the artificial hard substrates can contribute to the “stepping stones” effect. This effect is made when there is an increasing creation of artificial hard substrates and organisms can travel between sites, which were already unconnected.³⁷¹ Except in exceptional meteorological conditions, there are natural barriers that prevent some species from going beyond those natural boundaries, getting connected to other areas, and being dispersed.³⁷² The creation of hard substrates facilitates the spread and affects the abundance of species, potentially assisting the travel of invasive species and affecting population structures.³⁷³ The invasive species are generally a major threat to marine biodiversity and can have various impacts including displacement of native species, change in community structures, processes, and food webs, transforming habitats, and extinction of fisheries.³⁷⁴

Finally, artificial reefs can have adverse effects on the sand communities by changing the physical and biotic environment, particularly when the magnitude of such reefs expands over time. The artificial reefs alter the physical environment such as water motion and distribution and content of sediments. This alteration might affect ‘the abundance and types of suspended particles, substrate stability, and food availability, and

³⁷⁰ Daniel Simberloff, ‘Invasive Species’ in Navjot S Sodhi and Paul R Ehrlich (eds), *Conservation Biology for All* (Oxford University Press 2010) 131.

³⁷¹ Thomas P Adams and others, ‘Offshore Marine Renewable Energy Devices as Stepping Stones across Biogeographical Boundaries’ (2014) 51 *Journal of Applied Ecology* 331–337; Joop WP Coolen and others, ‘Marine Stepping-stones: Connectivity of *Mytilus Edulis* Populations between Offshore Energy Installations’ (2020) 29 *Molecular Ecology* 686.

³⁷² Adams and others (n 371) 331.

³⁷³ *ibid* 333.

³⁷⁴ Jennifer L Molnar and others, ‘Assessing the Global Threat of Invasive Species to Marine Biodiversity’ (2008) 6 *Frontiers in Ecology and the Environment* 485.

could result in either an increase or decrease in infaunal densities, depending on the adaptation of the species involved'.³⁷⁵

2.1.3 Acoustic Impacts

Offshore turbines and related activities also create noise in all phases of their lifetime, which may have impacts on the surrounding environment. All phases of OWE, which can be categorized into prospecting and site surveys, construction, operation, and decommissioning, emit different noise levels.³⁷⁶ The impacts are categorized into preconstruction, construction, operation, and decommissioning as follows.

- i) In the period before construction, geological surveys such as multibeam and side-scan sonar surveys are employed to map the seafloor.³⁷⁷ The impacts of the survey phase are not well-examined. Although physical injury and damage are not expected and the impacts on fish hearing are minimal, the noise from surveying ships might mask communication signals for marine animals.³⁷⁸
- ii) During construction, pile driving makes noises that are created from hammer strikes and it can be propagated up to tens of kilometers.³⁷⁹ The level of sound during the construction phase is so high that it may cause injury and mortality of marine mammals and fish or other effects within tens of meters from the construction site.³⁸⁰ Such noises are likely to displace mammals for a short

³⁷⁵ RF Ambrose and TW Anderson, 'Influence of an Artificial Reef on the Surrounding Infaunal Community' (1990) 107 *Marine Biology* 41, 50.

³⁷⁶ T Aran Mooney, Mathias H Andersson and Jenni Stanley, 'Acoustic Impacts of Offshore Wind Energy on Fishery Resources: An Evolving Source and Varied Effects across a Wind Farm's Lifetime' (2020) 33 *Oceanography* 83.

³⁷⁷ *ibid* 86.

³⁷⁸ *ibid* 87.

³⁷⁹ English and others (n 204) 39.

³⁸⁰ Schuster, Bulling and Köppel (n 48) 319; English and others (n 204) 39 & 51.

period of time and they possibly have effects on the long-term population as they change the mammals' behavior of feeding, mating, and interacting.³⁸¹ Noise can also mask signals used for communication, predator avoidance, and prey detection for mammals.³⁸² The overlap between the installation period of OWE and the "sensitive ecological periods" of spawning and migration of mammals are important factors in the impact of noise on the surrounding environment.³⁸³

- iii) The noise during operation is infrasound (low-frequency noise) and has been considered insignificant.³⁸⁴ However, the continued noise during this phase may have some impacts on the "communication, foraging, and predator detection" of mammals.³⁸⁵ The behavioral reactions of fishes vary and there might be a high risk of masking communication signals.³⁸⁶
- iv) Regarding the decommissioning phase, there might be different sounds and disturbances depending on the type of decommissioning, which can be total or partial removal, but it is not yet clear what potential impacts (such as displacement) might occur.

Notwithstanding different phases of OWE projects, in assessing the impacts on species' behavioral reactions, factors such as foundation type, sound propagation

³⁸¹ Schuster, Bulling and Köppel (n 48) 319.

³⁸² Mooney, Andersson and Stanley (n 376) 84 & 90.

³⁸³ English and others (n 204) 39.

³⁸⁴ Schuster, Bulling and Köppel (n 48) 319.

³⁸⁵ Mooney, Andersson and Stanley (n 376) 91.

³⁸⁶ *ibid.*

conditions, wind speed, the hearing ability of species, and the size of the wind farm must be considered.³⁸⁷

It should be noted that it is not easy to mitigate noise during operation³⁸⁸, but for the construction phase, some measures can be taken. Low noise piling technologies can be employed, and noise can be reduced at the source, e.g., through modifying pile driving and changing the force exerted by hammers, or by switching to alternative methods of pile driving such as traditional vibratory piling. Barriers can also be created like bubble curtains, casings that enclose piles, or other noise mitigation systems. In addition, seasonal restrictions can be imposed, and noisy activities can be prohibited when mammals are present within 500m, in a specific area, or within a certain period of the year.³⁸⁹

Finally, there are gaps in knowledge, which need to be examined by research. For example, Mooney, Andersson, and Stanley identify some areas for further research such as the noise impacts on species, a range of taxa, the population level, the development of larvae as well as the long-term operational noise on fish and invertebrates.³⁹⁰

2.1.4 Electromagnetic Fields

Generally, most marine animals have the potential to detect electromagnetic fields (EMF) or are sensitive to them.³⁹¹ For example, some marine animals like sharks and some fishes are electroreceptive i.e. they use their sense to find prey through the bioelectric fields

³⁸⁷ Schuster, Bulling and Köppel (n 48) 319.

³⁸⁸ Mooney, Andersson and Stanley (n 376) 91.

³⁸⁹ English and others (n 204) 39–43; Apostolos Tsouvalas, ‘Underwater Noise Emission Due to Offshore Pile Installation: A Review’ (2020) 13 *Energies* 3057. There is a distinction in foundation types; for example, suction caissons do not use piles, while jacket foundations feature smaller piles than monopiles.

³⁹⁰ Mooney, Andersson and Stanley (n 376) 93.

³⁹¹ Andrew B Gill and others, ‘Marine Renewable Energy, Electromagnetic (EM) Fields and EM-Sensitive Animals’ in Mark A Shields and Andrew IL Payne (eds), *Marine Renewable Energy Technology and Environmental Interactions* (Springer Netherlands 2014) 69.

emitted by prey.³⁹² Some types of fish like salmon, plaice, tuna, and cod are not electroreceptors but can be guided by magnetic fields such as water and tidal movements to forage by getting the sense from tidal flows.³⁹³ Some other types of marine animals such as cetaceans, turtles, some teleosts, crustaceans, and mollusks use magnetic particles in their tissue or photoreceptor molecules in their eyes to find magnetic fields so that they can navigate through water.³⁹⁴ These natural senses in using electromagnetic fields are not known well, let alone the interaction of marine animals with human-induced electromagnetic fields.³⁹⁵

Transmission of electricity or moving electric charges through cables connected to OWE produces EMF in the seabed and water around the cables. It is not clear but marine animals might be confused or disguised by the electromagnetic fields, which lead to various effects such as confusion to forage for prey and impairment in navigation.³⁹⁶ The evidence is limited to confirm that electromagnetic fields do not affect the navigation and orientation of marine animals.³⁹⁷ Marine animals also show different behaviors in response to electromagnetic fields –some animals like the American lobsters may show exploratory behaviors, and some others like crabs may show attraction behaviors to electromagnetic fields, although the results of studies are contradictory with respect to similar species.³⁹⁸ In addition, it is unclear what impacts the electromagnetic fields will have on individual animals, their developmental processes, different species, and ecological impacts such as

³⁹² *ibid.*

³⁹³ *ibid.*

³⁹⁴ *ibid* 70.

³⁹⁵ *ibid.*

³⁹⁶ *ibid* 74–75.

³⁹⁷ U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) (n 307) 6.

³⁹⁸ *ibid* 7.

animals' breeding, feeding, production, growth, health, population distribution, and demographics.³⁹⁹ The industry has also faced significant uncertainties over the assessment methods and the details of monitoring programs.⁴⁰⁰ Therefore, impact assessments and their management require more evidence and policies and regulations of direct relevance to pressures and receptors in order to prevent emissions arising from electromagnetic fields.⁴⁰¹

Several measures can be taken to mitigate the impacts of electromagnetic fields. Firstly, cables can be buried 1-2 meters below the seabed or covered by concrete mattresses. Although cable burial offers some barriers in favor of physical contact between cables and epibenthic animals (but not infauna), it is not effective in terms of lowering the effects below an acceptable limit which ensures that animals do not detect the anthropogenic electromagnetic fields.⁴⁰² Secondly, it is also important to identify an appropriate site for OWE so that the impacts on habitats with electro/magneto-sensitive species can be reduced.⁴⁰³ Thirdly, cables that operate at high voltages can generate the same power but with lower intensity.⁴⁰⁴ Finally, the reduction of distance between multiple parallel cables can reduce the areas with magnetic fields while technical considerations and limitations are taken into account.⁴⁰⁵

³⁹⁹ Gill and others (n 391) 77.

⁴⁰⁰ *ibid* 74.

⁴⁰¹ Zoë Hutchison, David Secor and Andrew Gill, 'The Interaction Between Resource Species and Electromagnetic Fields Associated with Electricity Production by Offshore Wind Farms' (2020) 33 *Oceanography* 103.

⁴⁰² Gill and others (n 391) 67.

⁴⁰³ U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) (n 307) 10.

⁴⁰⁴ *ibid*.

⁴⁰⁵ *ibid*.

2.1.5 Seabirds

The main concerns related to the impacts of OWE on seabirds are displacement, barrier effects, habitat losses, and collision risks.⁴⁰⁶ The impacts on seabirds depend on different variables such as site locations and characteristics, the topography of the area, the involved habitat, the species, and the number of birds.⁴⁰⁷ The types of impacts might be similar or different during the construction and operation phases.

During the construction period, there are several activities such as ship traffic and pile driving, which might extremely disturb birds and their prey. Divers and common scoters might be disturbed or displaced due to physical activities of construction and movement of ship maintenance.⁴⁰⁸ Such displacement causes habitat loss, which means the birds' habitat (i.e. where they forage) is no longer available effectively. It also causes competition for food because the displaced birds must forage in the adjacent areas where other birds and animals have been foraging.⁴⁰⁹ This situation is particularly heightened in shallow waters which are suitable for the installation of OWE and where birds typically forage.⁴¹⁰

The same disturbing and displacement impacts might be equally true during the operation period, leading to the loss of their habitats. There might be different impacts during this period such as barrier effect and collision risk as well. OWE might create barriers to the migration and feeding movement of birds. Due to such barriers, birds generally show avoidance response and have to change their routes and fly longer than

⁴⁰⁶ Allan L Drewitt and Rowena HW Langston, 'Assessing the Impacts of Wind Farms on Birds: Impacts of Wind Farms on Birds' (2006) 148 *Ibis* 29, 29.

⁴⁰⁷ *ibid.*

⁴⁰⁸ English and others (n 204) 121 & 122.

⁴⁰⁹ *ibid.*

⁴¹⁰ *ibid* 121.

normal between their breeding colonies and feeding areas which require spending more energy (known as “energetic costs”), which may cause survival and reproductive success as well as a risk of chick predation due to the absence during their prolonged aviation.⁴¹¹ The frequency of avoidance behavior is a determining factor in energetic costs, hence the higher frequency of avoidance behavior leads to significant energetic costs.⁴¹² It is, however, very difficult to provide a general conclusion about how birds respond to disturbing and displacement because their responses are dependent upon site, species, individual responses of species, their level of habituation to wind farms, and the abundance of food.⁴¹³

Collision of birds with wind turbines is another potential risk during the operation period. This risk is a typical risk between birds and man-made structures such as lighthouses.⁴¹⁴ Reports of collision mortality and collisions of migratory birds with offshore wind turbines are rare but this collision risk is the main concern with offshore oil and gas platforms that can be translated into OWE.⁴¹⁵ In addition, a lack of reports or information about collision mortality should not be necessarily interpreted as a low-rate risk because detecting collisions is difficult at sea and appropriate monitoring mechanisms should be in place to assess such risks.⁴¹⁶ Nonetheless, mortality rate cannot always be a main factor in impact assessments and other considerations are also important. For example, in the case of ‘long-lived species with low productivity and slow maturation rates,

⁴¹¹ *ibid* 123; Anthony D Fox and Ib Krag Petersen, ‘Offshore Wind Farms and Their Effects on Birds’ (2019) 113 *Orn. Foren. Tidsskr* 86, 89.

⁴¹² Fox and Petersen (n 411) 89.

⁴¹³ *ibid* 90.

⁴¹⁴ English and others (n 204) 123.

⁴¹⁵ Schuster, Bulling and Köppel (n 48) 315.

⁴¹⁶ Drewitt and Langston (n 406) 32.

especially when rare species of conservation concern are affected', other variables such as the impacts on the population level and the cumulative effects of various pressures on birds should be considered.⁴¹⁷

The level of collision risk also depends on several factors including the wind farm site location, the type, numbers, and behavior of bird species, weather conditions, and the topography of the area.⁴¹⁸ For example, birds fly lower when there are headwinds or low cloud ceilings, increasing the likelihood of their collision with wind turbines.⁴¹⁹ The birds' behavior also is a determining factor because birds that show strong avoidance of man-made structures are more likely to show strong responses to offshore wind turbines.⁴²⁰ It is also likely that indigenous birds recognize the turbines and fly around them, but that is not the case for migratory birds that are not familiar with the area.⁴²¹ The site location is also important as OWE projects may be located in high-wind areas or near coasts, which causes profound concerns. The high wind areas are where the migratory bird corridors are located, or migratory birds usually use coastlines as their corridors.⁴²² In addition, the risk varies among different bird species. For example, some birds such as guillemot are at lower risk as they fly at a lower level than the turbine blades, while other species such as gulls are at greater risk because they fly at the height range of blades and are attracted to wind farms.⁴²³

⁴¹⁷ *ibid* 30.

⁴¹⁸ *ibid* 31; Allan L Drewitt and Rowena HW Langston, 'Collision Effects of Wind-Power Generators and Other Obstacles on Birds' (2008) 1134 *Annals of the New York Academy of Sciences* 232.

⁴¹⁹ Drewitt and Langston (n 418) 237.

⁴²⁰ Fox and Petersen (n 411) 93.

⁴²¹ Rivkin and Silk (n 47) 124.

⁴²² Schuster, Bulling and Köppel (n 48) 315.

⁴²³ English and others (n 204) 124.

To mitigate the impacts on birds, several measures have been taken. They include an appropriate selection of OWE, avoiding key areas of conservation importance and sensitivity, implementing monitoring programs, restriction in certain months of the year, requiring construction ships to use the current navigation lanes to decrease the disturbance risk, seasonal restrictions on cable laying, and phased construction and monitoring the previous phase to minimize impacts for construction of future phases.⁴²⁴

Finally, some major challenges should be considered in the development of OWE. The cumulative effect is the most challenging impact for the assessment of OWE. This challenge is because cumulative impact assessment on birds' populations, particularly migratory birds' populations, is difficult due to the lack of guidance.⁴²⁵ Another issue is the assessment of the collision of small birds. The absence of a strong monitoring system to assess such risk is important as the mortality collision can be high when the weather conditions are not favorable.⁴²⁶

2.1.6 Bats

The collision of bats with wind turbines has been a major concern. Their fatality rate is more than birds at most onshore and offshore wind farms.⁴²⁷ Explanation is hard to provide with certainty as to why bats are attracted to turbines as it is a very complex issue but there are a couple of explanations. It is hypothetically argued that the collision of tree bats occurs because they are engaged in mating behavior, and turbines that resemble tall

⁴²⁴ *ibid* 128; Drewitt and Langston (n 406) 37; Fox and Petersen (n 411) 86; Drewitt and Langston (n 406) 37 & 38.

⁴²⁵ Fox and Petersen (n 411) 97.

⁴²⁶ *ibid*.

⁴²⁷ Schuster, Bulling and Köppel (n 48) 301.

trees act like a stimulus and bats are attracted to them.⁴²⁸ Another explanation rejects the previous explanation of mating behavior due to a lack of enough direct evidence and dismisses other explanations such as sound, heat, and magnetic fields.⁴²⁹ This study suggests that more than 90% of bat mortality at wind turbines in Europe and North America is highly seasonal and occurs between late July and early October which coincides with bat migration.⁴³⁰ Solick and Newman also found that in North America the collision risk would most likely occur during autumn migration for long-distance migrating bats, but it is possible that higher wind speeds can reduce the collision risk duration.⁴³¹ Furthermore, the current gaps in knowledge in terms of bats species, population sizes, the types and activities of bats over the oceans, and the offshore mortality rates, make it hard to assess the impacts of OWE on bats.⁴³²

To minimize bat fatality, some measures are suggested to be taken. An appropriate selection of sites through avoidance of sensitive habitats, setting a standard distance from bat roosts, ultrasonic acoustic deterrents, effective monitoring, and operational curtailment⁴³³ is the effective mitigation measure that reduces the fatality rate.⁴³⁴ For

⁴²⁸ Paul M Cryan, 'Mating Behavior as a Possible Cause of Bat Fatalities at Wind Turbines' (2008) 72 *Journal of Wildlife Management* 845.

⁴²⁹ Jens Rydell and others, 'Mortality of Bats at Wind Turbines Links to Nocturnal Insect Migration?' (2010) 56 *European Journal of Wildlife Research* 823, 825.

⁴³⁰ *ibid.*

⁴³¹ Donald I Solick and Christian M Newman, 'Oceanic Records of North American Bats and Implications for Offshore Wind Energy Development in the United States' (2021) 11 *Ecology and Evolution* 14433.

⁴³² *ibid* 14442.

⁴³³ One of the mechanisms is to raise the cut-in speed (wind speed at which turbines start producing electricity). Bats fatalities happen when wind speed is low and raising cut-in speed reduces the bat fatalities.

⁴³⁴ Sara P Weaver and others, 'Ultrasonic Acoustic Deterrents Significantly Reduce Bat Fatalities at Wind Turbines' (2020) 24 *Global Ecology and Conservation* e01099; Christian C Voigt and others, 'Wind Turbines without Curtailment Produce Large Numbers of Bat Fatalities throughout Their Lifetime: A Call against Ignorance and Neglect' (2022) 37 *Global Ecology and Conservation* e02149; K Shawn Smallwood

instance, one of the most effective minimization measures is to raise the cut-in speed (wind speed at which blades rotate, and turbines start generating electricity).⁴³⁵ Raising cut-in speed reduces the bat fatalities because bat fatalities happen when wind speed is low. This curtailment may cause a loss of production and revenue; hence, “smart curtailment” is used to shut down turbines only in cases of detecting bats activities migration season, and regional weather patterns.⁴³⁶

2.1.7 Visual, Seascape and Landscape Impacts

The close development of OWE to coasts may cause visual, seascape, and landscape impacts. The visual impact is related to the perception or experience of people about the change of their view from a particular point which is created due to the development of OWE.⁴³⁷ One of the consequences of visual impact is that it causes public opposition and concerns, which is sometimes known as “not in my backyard”. This term might indicate a self-interested view, or it could be discussed better under the socio-political and “community acceptance” or the term “place-protective action”, discussing disruption of existing emotional attachments and threatening identity processes related to the place.⁴³⁸ The socio-political acceptance concerns the general picture and attitudes of the public towards the support for renewable energy and whether stakeholders and

and Douglas A Bell, ‘Effects of Wind Turbine Curtailment on Bird and Bat Fatalities’ (2020) 84 *The Journal of Wildlife Management* 685.

⁴³⁵ Solick and Newman (n 431) 14442.

⁴³⁶ *ibid.*

⁴³⁷ RG Sullivan, ‘Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States’ (US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs 2021) OCS Study BOEM 2021-032 vi.

⁴³⁸ Rolf Wüstenhagen, Maarten Wolsink and Mary Jean Bürer, ‘Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept’ (2007) 35 *Energy Policy* 2684; Patrick Devine-Wright, ‘Rethinking NIMBYism: The Role of Place Attachment and Place Identity in Explaining Place-Protective Action’ (2009) 19 *Journal of Community & Applied Social Psychology* 426.

policymakers accept the development of this sector.⁴³⁹ Community acceptance is the second, but narrower, dimension of social acceptance and considers the engagement of stakeholders, residents, local communities, and authorities as the relevant parties in site selections and decision-making processes of OWE.⁴⁴⁰

A key factor in coastal communities' perception of the East Coast of the US is the distance from shore and other factors such as the size of turbines might be regarded as insignificant.⁴⁴¹ However, coastal people's perceptions may change over time compared to what they perceived before the development of OWE, and their views may become more negative or positive over time based on their experience.⁴⁴² Public perception may be more positive if the OWE projects are located far from a distance.⁴⁴³

Nonetheless, the visual impact is not the only impact because it only relates to the impact on people's viewpoints towards the development of OWE, while there might be seascape and landscape impacts, which are the impacts related to 'both the physical elements and features that make up a landscape or seascape and the aesthetic, perceptual, and experiential aspects of the landscape or seascape that make it distinctive'.⁴⁴⁴ The focus of visual impact is on how a view from a particular place is composed, while the seascape and landscape impacts are related to the components, physical features, and distinctive

⁴³⁹ Wüstenhagen, Wolsink and Bürer (n 438) 2685.

⁴⁴⁰ *ibid*; Jeremy Firestone and Willett Kempton, 'Public Opinion about Large Offshore Wind Power: Underlying Factors' (2007) 35 *Energy Policy* 1584.

⁴⁴¹ Alexana Cranmer and others, 'Getting to 30 GW by 2030: Visual Preferences of Coastal Residents for Offshore Wind Farms on the US East Coast' (2023) 173 *Energy Policy* 113366.

⁴⁴² Jacob Ladenburg, 'Visual Impact Assessment of Offshore Wind Farms and Prior Experience' (2009) 86 *Applied Energy* 380; Jeremy Firestone and others, 'Faring Well in Offshore Wind Power Siting? Trust, Engagement and Process Fairness in the United States' (2020) 62 *Energy Research & Social Science* 101393.

⁴⁴³ Ladenburg (n 442).

⁴⁴⁴ Sullivan (n 437) vi.

characters of the seascape and landscape.⁴⁴⁵ Although the nature and the extent of these two impacts are separate and initially assessed separately, the judgment about their sensitivity and magnitude are systematically combined and evaluated.⁴⁴⁶

The visual, seascape, and landscape impacts cannot be avoided or mitigated significantly because OWE consists of a considerable number of turbines, occupies a sizable area, and the turbine parts are brightly colored for the safety of navigation.⁴⁴⁷ However, some mitigation measures are recommended. For example, an appropriate design and siting is an effective tool that should be based on a range of data including professional views, inputs received from stakeholders, information about scenic, historic, and cultural resources, assessment of existing and potentially affected resources, and photo simulations.⁴⁴⁸

2.2 Potential Conflicting Uses

Assessment of the impacts of the development of OWE on other marine uses is critical because an integrated approach toward this development informs planning and the socio-economic effects of this sector. The development of OWE might create conflicts with other sectors and dislocate marine users, causing the loss of jobs. In this section, the impacts on key sectors such as commercial fishing and shipping will be discussed and finally, the impacts on other sectors such as aviation will be generally noted.

⁴⁴⁵ *ibid.*

⁴⁴⁶ *ibid.*

⁴⁴⁷ *ibid* 70.

⁴⁴⁸ *ibid* 71 & 72.

2.2.1 Impacts on Commercial and Recreational Fishing

As discussed in 2.1, changes in habitats and the creation of artificial reefs have some possible positive and negative effects such as attracting some species, increasing the abundance of some types of fish, the introduction of invasive species, although further research is needed to fully understand the ecological impacts of OWE. It is also discussed that the impacts that EMF have on fisheries are not clear and there are a lot of uncertainties about EMF impacts. While it is important to consider these impacts in the assessment process of the development of OWE as they have implications for fishing, there are also other potential impacts on fishing arising from the development of OWE.

Commercial fisheries have been concerned about the loss of access to fishing grounds (or “prime fishing areas”), their exclusion, and displacement to alternative locations. The loss of access is due to the restrictions made by OWE developers. Fishing, particularly trawling, is not usually permitted, and the specific restricted zone is called “safety buffer zones”, “de-facto marine reserves”, “no-take zones”, and “fishing closures”,⁴⁴⁹ depending on which perspective is considered, whether safety, ecological benefits, or a fishing ban. This restriction is sometimes imposed by law for the safety of wind farms through a ban on fishing within OWE and in a buffer zone around the farm.⁴⁵⁰ Sometimes, there is no ban, but practical issues such as liability, safety of the wind farm, safety of navigation, and lack of insurance coverage prevent a multi-use of the area.⁴⁵¹

⁴⁴⁹ Bailey, Brookes and Thompson (n 43) 2; Andronikos Kafas and others, ‘Displacement of Existing Activities’ in Katherine L Yates and Corey JA Bradshaw (eds), *Offshore Energy and Marine Spatial Planning* (Routledge 2018) 89.

⁴⁵⁰ Andrew Gill and others, ‘Setting the Context for Offshore Wind Development Effects on Fish and Fisheries’ (2020) 33 *Oceanography* 119, 120 & 125.

⁴⁵¹ *ibid.*

Exclusion and loss of access to fishing grounds may have economic, social, and environmental effects. Reviewing the literature, Kafas et al. provide a summary of the negative and positive effects. The direct negative effects include conflicts among fishers on the over-allocation of catch, lack of knowledge about the quantity and quality of alternative fishing grounds, longer travel to alternative grounds (leading to costs and longer hours), conflicts with other marine uses, the possibility of safety issues, and loss of income or profit.⁴⁵² Loss of access to fishing grounds might have negative indirect effects such as loss of knowledge, culture, and traditions about fisheries as well as an increase in environmental pressure on other areas.⁴⁵³ However, the restriction on fisheries can provide positive effects. It can act as *de facto* marine protected areas and reduce the ecological impacts by lowering the pressure on benthic communities⁴⁵⁴, although this benefit is disputed because the purpose and design of marine protected areas are to improve fishery resources while OWE projects lack the required elements to serve the purpose and function of marine protected areas.⁴⁵⁵ It can also cause a “spill-over” effect and increase in abundance of fish in adjacent areas, which may lead to increased production and income.⁴⁵⁶ In addition, displacement may require adaptation and diversification and the creation of opportunities in terms of new fishing capacity, new species, and development of other opportunities such as aquaculture and tourism.⁴⁵⁷

⁴⁵² Kafas and others (n 449) 92–96.

⁴⁵³ *ibid.*

⁴⁵⁴ *ibid* 94.

⁴⁵⁵ Gill and others (n 450) 120.

⁴⁵⁶ Kafas and others (n 449) 95.

⁴⁵⁷ *ibid.*

With the negative effects of the development of OWE on fisheries and displacement effects, some mitigating measures might be taken to minimize such effects. An appropriate site selection during the planning process, transparent and legitimate consultation processes, constructive negotiations with fishers, and preventive and proactive measures are among the most effective ways to reduce tensions between these two sectors.⁴⁵⁸ In addition, financial packages such as “assistance mechanisms”, which include alternative employment opportunities, payment of additional costs incurred by fishers, or provision of new fishing technologies to fishers, may set off the adverse economic impact imposed on fishers.⁴⁵⁹

2.2.2 Impacts on Shipping

There might be an interaction between OWE and shipping in terms of safety of navigation and costs. First, the safety challenges that OWE may create for vessels⁴⁶⁰ are of different types. The required large space for OWE might limit the access or available spaces for navigation. Safety of navigation requires that vessels, particularly large commercial vessels, have enough operational flexibility in terms of space and time so that they can avoid collision with obstacles or vessels, particularly small fishing and recreational boats that are hardly visible in the vicinity of OWE.⁴⁶¹ Hence, curbing ship lanes for OWE and intensifying traffic creates the risk of collision between vessels or

⁴⁵⁸ *ibid* 97–99.

⁴⁵⁹ *ibid* 100.

⁴⁶⁰ Vessels can be any type such as fishing, recreational or military boats or any vessels visiting wind turbines for the purpose of repair or transfer of personnel or equipment; see Lijuan Dai and others, ‘Risk of Collision between Service Vessels and Offshore Wind Turbines’ (2013) 109 *Reliability Engineering & System Safety* 18.

⁴⁶¹ Andrew Rawson and Edward Rogers, ‘Assessing the Impacts to Vessel Traffic from Offshore Wind Farms in the Thames Estuary’ (2015) 43 *Scientific Journals of the Maritime University of Szczecin* 100. In addition to safety of navigation, shipping efficiency or the time and cost for rerouting around OWF is considered in the assessment as well.

allision (strike of a vessel against a fixed object).⁴⁶² Although an exact and updated number of strikes between vessels and OWE structures could not be found, Moulas and others, with reference to Caithness Windfarm Information Forum⁴⁶³, note that there had been 164 accidents between 2012 and 2016⁴⁶⁴ and as of 2023, the most recent reported strike between a cargo ship and a turbine occurred at Orsted God Wind 1 offshore wind farm in the German North Sea in April of 2023.⁴⁶⁵ The physical contact might also happen between OWE cables and the navigation of ships. The vessels, which want to anchor near OWE or other areas related to OWE where OWE cables are located, might be impacted or have impacts on OWE cables.⁴⁶⁶ Although OWE cables are usually buried, this risk might occur due to scouring by currents.⁴⁶⁷

Impact on the safety of navigation and confusion in ship navigation might also occur when OWE projects interfere with navigation equipment on the vessels, which is called electromagnetic interference. The clutter on radar screens was found in the North

⁴⁶² The allision might be strike of vessels against any kind of fixed object, which include the wind farm structures themselves.

⁴⁶³ 'Caithness Windfarm Information Forum' <<http://www.caithnesswindfarms.co.uk/>> accessed 18 September 2023.

⁴⁶⁴ D Moulas, M Shafiee and A Mehmanparast, 'Damage Analysis of Ship Collisions with Offshore Wind Turbine Foundations' (2017) 143 *Ocean Engineering* 149, 150.

⁴⁶⁵ 'Cargo Ship Hits Turbine at North Sea Wind Farm: Orsted Investigates | Recharge' <<https://www.rechargenews.com/wind/cargo-ship-hits-turbine-at-north-sea-wind-farm-orsted-investigates/2-1-1442789>> accessed 18 September 2023.

⁴⁶⁶ Malcolm Sharples, 'Offshore Electrical Cable Burial For Wind Farms: State of the Art, Standards and Guidance & Acceptable Burial Depths, Separation Distances and Sand Wave Effects' (Risk & Technology Consulting Inc 2011) 111 <<https://www.bsee.gov/sites/bsee.gov/files/tap-technical-assessment-program/final-report-offshore-electrical-cable-burial-for-wind-farms.pdf>> accessed 18 September 2023; 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 Online* 10 <https://brill.com/abstract/journals/ocyo/30/1/article-p0_17.xml> accessed 18 September 2023.

⁴⁶⁷ *ibid.*

Holye wind farm of the UK and later in Horns Rev in Denmark.⁴⁶⁸ The North Holye wind farm was the first large-scale OWE in the UK in which the potential effects of this development on radar, communication, and navigation systems were experimentally tested. This test found a significant concern on the effects that OWE has on “shipborne and shorebased radar systems”, returning radar responses and producing reflected and interfering echoes.⁴⁶⁹

Second, the location of OWE might have economic implications. For instance, a hypothetical cost-effective analysis study has been conducted with respect to the economic impacts of near-shore and far-from-shore large-scale development of OWE in the US mid-Atlantic.⁴⁷⁰ Vessels’ rerouting creates additional costs, which include fuel, operating, capital, and external costs of emission.⁴⁷¹ This rerouting may, however, bring about significant savings compared to an OWE site which is located far from shore.⁴⁷² Hence, economic factors are considered in determining the location of OWE and likely changes that need to be made to shipping routes.

To minimize the impacts of OWE on shipping, some mitigation measures are recommended. Generally, as part of EIA, “navigational risk assessments” are conducted by developers to assess the risks related to maritime safety and demonstrate that measures

⁴⁶⁸ Hao Ling and others, ‘Final Report DE-EE0005380: Assessment of Offshore Wind Farm Effects on Sea Surface, Subsurface and Airborne Electronic Systems’ (2013) DOE-UTEXAS-EE0005380, 1096175 5 <<http://www.osti.gov/servlets/purl/1096175/>> accessed 19 September 2023.

⁴⁶⁹ Martin Howard and Colin Brown, ‘Results of the Electromagnetic Investigations and Assessments of Marine Radar, Communications and Positioning Systems Undertaken at the North Hoyle Wind Farm by QinetiQ and The Maritime and Coastguard Agency’ (QinetiQ and The Maritime and Coastguard Agency (MCA) 2004) QINETIQ/03/00297/1.1, MCA MNA 53/10/366 3 <https://cpdp.debatpublic.fr/cpdp-eolien-en-mer/DOCS/DOCS/NORTH_HOYLE_COAST_GUARD_11_22_0.PDF> accessed 19 September 2023.

⁴⁷⁰ Kateryna Samoteskul and others, ‘Changing Vessel Routes Could Significantly Reduce the Cost of Future Offshore Wind Projects’ (2014) 141 *Journal of Environmental Management* 146.

⁴⁷¹ *ibid* 153.

⁴⁷² *ibid*.

are taken to adequately manage such risks.⁴⁷³ More specifically, to mitigate the effects of OWE on radar systems, some measures can be taken such as rerouting around OWE, training radar operators to recognize OWE clutter from real targets, a proper site selection, and relocating and /or improving radar systems.⁴⁷⁴ It is, however, arguable that these mitigating measures cause new impacts. For example, rerouting may require additional costs and environmental impacts such as dredging new channels and more carbon emissions by ships because of new longer routes.⁴⁷⁵

2.2.3 Other Sectors

While the impacts of OWE on fisheries and shipping are more common because of the large space that the OWE industry, as well as fisheries and shipping, occupy in marine areas, the impacts on other sectors need to be seen whether there are any activities such as aviation, military, oil and gas, and tourism in the vicinity of OWE. For example, the impacts of OWE in the US Atlantic Outer Continental Shelf have been a real concern because of possible interference with radar systems of commercial and military aviation. This concern has been raised recently in the US, which has ambitious plans for the development of OWE, and the House of Representatives passed an amendment, requiring the federal government to certify that

⁴⁷³ Raza Ali Mehdi and others, 'Improving the Coexistence of Offshore Wind Farms and Shipping: An International Comparison of Navigational Risk Assessment Processes' (2018) 17 *WMU Journal of Maritime Affairs* 399–400. According to this author, an acceptable level of risk is “the maximum combined level of probability and consequence” – either the likelihood or consequences of accidents must be low to be acceptable.

⁴⁷⁴ Ling and others (n 468) 7.

⁴⁷⁵ Aykut I Ölçer and others (eds), 'A Framework to Improve the Coexistence of Maritime Activities & Offshore Wind Farms', *Trends and Challenges in Maritime Energy Management*, vol 6 (Springer International Publishing 2018) 514.

(1) offshore wind projects in the North Atlantic and Mid-Atlantic Planning Areas will not weaken, degrade, interfere with, or nullify the performance and capabilities of radar relied upon by commercial aviation, military aviation, space launch vehicles, or other commercial space launch activities; and (2) the development of offshore wind projects in the North Atlantic and Mid-Atlantic Planning Areas will not degrade the capabilities of the Federal Aviation Administration to monitor United States air space, or hinder commercial, private, or military aviation activities.⁴⁷⁶

The concerns over the interference of OWE with radar systems are also supported by scientific studies.⁴⁷⁷ Therefore, the impact on marine uses depends on exploring the type of activities and their magnitude in marine areas.

2.3 Cumulative Effects

Preservation of ecosystems requires assessing the cumulative effects of OWE or the impacts of the development of OWE on ecosystems in combination with other offshore activities, although such assessment is challenging to apply. Generally, the cumulative effects of human activities are weakly understood and need more practice to be made

⁴⁷⁶ ‘Thousands of Offshore Wind Turbines Slated for Some of the Nation’s Busiest Airspace House Passes Smith Amendment Requiring Biden to Certify That Offshore Wind Industrialization Will Not Interfere with Commercial or Military Aviation | U.S. Representative’ <<https://chrissmith.house.gov/news/documentsingle.aspx?DocumentID=411589>> accessed 20 September 2023; ‘Certification and Report by Inspector General Relating to Radar Impacts and Offshore Wind Development Approval Process’ <https://chrissmith.house.gov/uploadedfiles/smitnj_071_xml.pdf> accessed 20 September 2023.

⁴⁷⁷ Russell J Colburn and others, ‘Radar Interference Analysis for Renewable Energy Facilities on the Atlantic Outer Continental Shelf’ (US Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs 2020) OCS Study BOEM 2020-039 <https://www.boem.gov/sites/default/files/documents/environment/Radar-Interference-Atlantic-Offshore-Wind_0.pdf> accessed 20 September 2023; Jason Biddle and Lorri Parker, ‘Ground-Based Coastal Air Surveillance Wind Turbine–Radar Interference Vulnerability Study’ (2017) <<https://www.energy.gov/sites/prod/files/2017/12/f46/Final%20Coastal%20Radar%20Public%20Summary%20-%20Comments%20Incorporated.pdf>> accessed 20 September 2023.

clear.⁴⁷⁸ The challenges start with the definition⁴⁷⁹ of “cumulative effects” as various definitions have been adopted and there is not any agreed and consistent definition for this term.⁴⁸⁰ For example, in one definition, it is defined as “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions”,⁴⁸¹ which seems only to consider human-induced actions. Another one defines it as ‘the combined effects from past, present, and reasonably foreseeable future activities and natural processes’.⁴⁸² The effects can derive from natural processes. Therefore, a clearly defined term and scope can help reduce the challenges of assessing OWE impacts.

A method is also needed to assess cumulative effects, although it is hard to introduce a unique one due to the complexity of the impact in the real world. An appropriate model for assessing cumulative effects, which is generally used and can be applied for the assessment of such effects for OWE, is to identify sources, pathways, and receptors or valued ecosystem components. Different terminologies have been used for this model such as “source-pathway-receptor”⁴⁸³ and “Driver, Pressure, State, Impact, Response

⁴⁷⁸ A John Sinclair, Meinhard Doelle and Peter N Duinker, ‘Looking up, down, and Sideways: Reconceiving Cumulative Effects Assessment as a Mindset’ (2017) 62 *Environmental Impact Assessment Review* 183.

⁴⁷⁹ The legal requirement for cumulative effects under Canadian law will be discussed in chapter three of this thesis.

⁴⁸⁰ AD Judd, T Backhaus and F Goodsir, ‘An Effective Set of Principles for Practical Implementation of Marine Cumulative Effects Assessment’ (2015) 54 *Environmental Science & Policy* 255.

⁴⁸¹ Council on Environmental Quality, United States Executive Office of the President, ‘Considering Cumulative Effects under National Environmental Policy Act’ (1997) 1 <<https://www.energy.gov/nepa/articles/considering-cumulative-effects-under-national-environmental-policy-act-ceq-1997>> accessed 22 September 2023.

⁴⁸² ‘Cumulative Effects’ <<https://www.canada.ca/en/environment-climate-change/services/cumulative-effects.html>> accessed 25 September 2023.

⁴⁸³ Judd, Backhaus and Goodsir (n 480) 256.

(DPSIR)”⁴⁸⁴, indicating the importance of identifications and evaluations as part of a systematic process of “cumulative effects assessment”.⁴⁸⁵ To connect this model to OWE development, a few examples of cumulative effects related to OWE developments such as the introduction of multiple man-made structures or multiple OWE projects were discussed in the previous sections. To provide some more specific examples, it should be noted that an assessment can identify the source of impacts from different activities such as pile-driving for OWE development during construction or turbines and vessels during operation, seismic surveys, and military activities, (“source”), noise and vibration (“pathway”), and marine mammals (“receptors/valued ecosystem components”).⁴⁸⁶ Sources, pathways, and receptors could be multiple and divergent, e.g., pile-driving, turbine operation, hunting and fishing → noise and animal taking/loss → fish, mammals, and seabirds.

The application of this model, however, has challenges. There might be pressure from industry and developers that the assessment of cumulative effects is very complex and delays the consenting process. Part of the complexity arises from fragmented consenting regimes, lack of sufficient data, the interaction of onshore and offshore pressures, and uncertainties arising from climate change.⁴⁸⁷ In addition, ‘the scale of cumulative impacts depends on the sensitivity of receptors, biophysical location, intensity,

⁴⁸⁴ Edith Smeets and Rob Weterings, ‘Environmental Indicators: Typology and Overview’ (European Environment Agency 1999) Technical report 25 4–6.

⁴⁸⁵ Lourdes M Cooper, ‘Guidelines for Cumulative Effects Assessment in SEA of Plans’ (Imperial College of London 2004) EPMG Occasional Paper 04/LMC/CEA 4
<<https://rgdoi.net/10.13140/RG.2.2.15095.29609>> accessed 25 September 2023.

⁴⁸⁶ Judd, Backhaus and Goodsir (n 480) 257.

⁴⁸⁷ English and others (n 204) 178–179; Edward A Willsteed and others, ‘Obligations and Aspirations: A Critical Evaluation of Offshore Wind Farm Cumulative Impact Assessments’ (2018) 82 *Renewable and Sustainable Energy Reviews* 2332, 2332.

and nature of developments – e.g. clustered or dispersed, technology type, and size’.⁴⁸⁸ Such challenges and complexities, however, should not be an excuse for reducing processes that are helpful for a better understanding of impacts and the solutions that can be found for the protection of ecosystems.

2.4 Conclusion

It is hard to make general conclusions from this chapter because the provided scientific knowledge is based on cause-and-effect analysis. Available data and information are either taken from samples during the actual performance and environmental monitoring or calculated based on scientific modeling. The studies are embedded in context-dependent variables, and they are subject to certain conditions, hence, their findings cannot normally be generalized and extrapolated into other marine conditions. For example, what we know about the impacts of offshore renewable energy on benthic ecosystems is drawn on “scattered monitoring programs” which have limitations in terms of the specific conditions where the programs are conducted.⁴⁸⁹ The scientific knowledge about “electrosensitivity” or “magneto-sensitivity” of species is also grounded in laboratory or field experiments.⁴⁹⁰ Therefore, the findings of scientific studies should be carefully used when they are going to be applied in similar ecosystems.

Furthermore, there are uncertainties with respect to the impacts of OWE on ecosystems and the extent of such uncertainties are different depending on the sources or receptors. For example, knowledge is much more limited on the impacts of OWE on bats

⁴⁸⁸ English and others (n 204) 178.

⁴⁸⁹ Wilding and others (n 361).

⁴⁹⁰ U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) (n 307) 6.

or the impacts of electromagnetic fields on species than the impacts of OWE on birds. The uncertainties are also heightened if we add the cumulative effects of OWE developments, the impacts of OWE on the other sectors, and uncertainties arising from climate change, ocean acidification, and plastic pollution. While these gaps and uncertainties should be reduced by further scientific research, laws and policies are the helpful social constructs and responses that are needed in times of risks and uncertainties. Legal responses and a good regulatory regime can be considered as a part of the “response” in the DPSIR framework. The following diagram is taken from the conceptual framework provided by the European Environment Agency in 1999 (Figure 4):⁴⁹¹

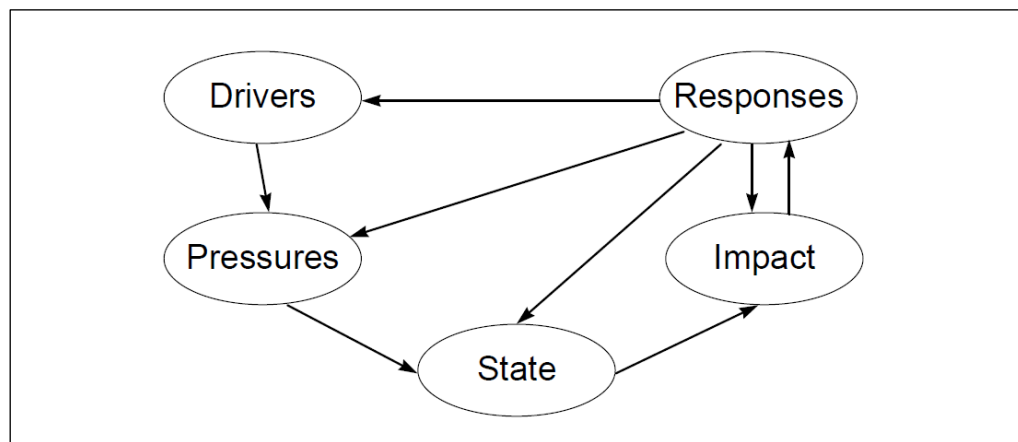


Figure 4- DPSIR framework

Based on this diagram, it can be stated that the development of OWE drives pressures on and changes the state of ecosystems, leading to impacts that require responses. Using the word “response” does not indicate that the responses that are reactive to impacts should only be explored, but a good regulatory framework in times of uncertainty requires

⁴⁹¹ Smeets and Weterings (n 484) 6.

a dynamic, recurring, and proactive process in which the law constantly acts, reacts, and proacts.⁴⁹² Due to uncertainties that have been explained in this chapter, anticipating the full impacts of the pressure arising from the development of OWE and depicting a full picture of responses are hard, but one of the purposes of this research is to discuss a good and responsive regulatory framework for this development in Canada.

⁴⁹² For discussions on adaptive management, see, for example, Brian C Chaffin, Hannah Gosnell and Barbara A Cosens, 'A Decade of Adaptive Governance Scholarship: Synthesis and Future Directions' (2014) 19 *Ecology and Society* <<https://www.jstor.org/stable/26269646>> accessed 22 November 2024; Byron K Williams, 'Adaptive Management of Natural Resources—Framework and Issues' (2011) 92 *Journal of Environmental Management* 1346.

CHAPTER THREE- CANADA'S OFFSHORE WIND ENERGY REGULATORY AND POLICY FRAMEWORK

OWE is tied to the concept of natural resources while it also depends on the sustainable management of broader environmental systems like ocean spaces and ecosystems. To examine existing regulatory frameworks for OWE in Canada based on ecological sustainability, this research first clarifies which level of government has jurisdiction over natural resources exploitation, including wind, and over environmental protection, including marine ecosystems. This chapter pursues two central matters: (i) Examining the constitutional division of regulatory powers over natural resources and environmental protection in Canada, and (ii) Analyzing the main current federal and provincial (using Nova Scotia as an illustrative example) laws and policies related to OWE.

The first section of this chapter establishes that according to the Constitution Act, 1867, (Constitution Act)⁴⁹³ and relevant court decisions, jurisdiction over the development of OWE and protection of marine environment related to OWE may fall under exclusive federal or exclusive provincial or shared federal/provincial jurisdiction. The first section also identifies lingering jurisdictional gaps and uncertainties. This complex jurisdictional framework sets the stage for the need to examine both federal and provincial laws and policies.

The second section of this chapter analyzes key federal and provincial laws (spotlight in Nova Scotia), mainly related to environmental issues and permitting processes, applicable to OWE. There is no *sui generis* unified system to govern the development and regulation of OWE in Canada. Applicable laws and policies are

⁴⁹³ The Constitution Act, 1867, 30 & 31 Vict, c 3, s 91.

fragmented, requiring the examination of a wide variety of laws and policies. The analysis also covers laws related to certain components of the marine environment, such as species at risk, as well as key competing sectors (e.g. fishing and shipping) that might be impacted by the development of OWE. Section two also discusses legal barriers, gaps, and uncertainties in the relevant Canadian laws.

3.1 Division of Powers and Jurisdiction over Natural Resources and the Environment

The division of powers between federal and provincial governments is part of the agreement reached under the Constitution Act in 1867 and is the foundation of the Canadian legal system. Section 91 of the Constitution Act outlines federal law-making powers. It starts with a general statement that covers matters that may generally affect the whole of Canada by stating that the Parliament ‘make Laws for the Peace, Order, and good Government of Canada, in relation to all Matters not coming within the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces’.⁴⁹⁴ It then lists 30 matters or “enumerated powers” which are within the exclusive legislative power of the Parliament, including “navigation and shipping”, “sea coast and inland fisheries”, and “the Criminal Law”.⁴⁹⁵

Similarly, provinces have an exclusive list of 15 enumerated powers under Section 92 of the Constitution Act. For example, provincial legislatures have the law-making power over non-renewable resources as well as property and civil rights (including contracts,

⁴⁹⁴ *ibid.*

⁴⁹⁵ *ibid* ss 91(10), 91(12), 91(27); Paul Atkinson and Daniel Atkinson, *The Canadian Justice System: An Overview* (Fifth Edition, Lexis Nexis Canada 2020) 16.

property ownership, etc.) in the province.⁴⁹⁶ Section 95 allows for federal and provincial concurrent jurisdictions in areas like agriculture and immigration, with conflicts resolved by the rule of federal paramountcy⁴⁹⁷ or a rule of interjurisdictional immunity.

The delineation of powers between federal and provincial jurisdictions is not always clear-cut. To determine the appropriate jurisdiction, courts examine the “pith and substance” of a law. This is a process that assesses the core matter of the legislation by looking at its purpose, effects, and function. In the case of examining a jurisdictional dispute, courts start by asking whether a law falls within one jurisdiction or both federal and provincial jurisdictions. Answering this question is contingent upon the examination of the “pith and substance” of that law. The term “pith and substance” is used to describe the “matter” i.e., the content, the purpose, the effect, and the function of a law.⁴⁹⁸ The pith and substance of a law may fall within both federal and provincial jurisdictions. In such cases, the most important feature of a law, which characterizes that law, is used to understand the dominant feature for being assigned under the “classes of subject” in either Section 91 or Section 92 of the Constitution Act.⁴⁹⁹ It should be noted that the lines between two levels may have limited adjustment where a law includes a provision or provisions that are deemed as relevant, necessary, and proper extensions for an effective application of

⁴⁹⁶ The Constitution Act (n 493) ss 92A, 92(13); *Borys v. Canadian Pacific Railway*, 1953 CanLII 414 (UK JCPC); *Prism Petroleum Ltd. v. Omega Hydrocarbons Ltd.*, 1994 ABCA 97 (CanLII).

⁴⁹⁷ Peter W Hogg, *Constitutional Law of Canada* (Fifth Edition (Student Edition), Carswell 2009) 412–413.

⁴⁹⁸ *ibid* 371–372.

⁴⁹⁹ *ibid*.

that law, even if such ancillary provisions fall outside the powers of the enacting jurisdiction (ancillary powers doctrine).⁵⁰⁰

Subject matters may also have two distinct aspects, allowing for concurrent application of valid laws from both federal and provincial legislatures. For example, a subject may fall within a head of power enumerated under Section 92 of the Constitution for one aspect and one purpose, while falling within Section 91 of the Constitution Act for another aspect and another purpose. In other words, both Parliament and provincial legislature have jurisdiction to pass laws and regulations with respect to the same subject, provided they are regulating an aspect that falls under their respective power.

Different constitutional law doctrines may be used to resolve potential conflicts. Interjurisdictional immunity may apply whereby exclusive jurisdiction is allocated for both levels of government⁵⁰¹ and valid laws are not applied “in core areas of jurisdiction assigned to the other level of government”.⁵⁰² This doctrine is not applied broadly and is limited to cases where there is a precedence⁵⁰³ and should generally not be applied ‘where the legislative subject matter presents a double aspect and both federal and provincial authorities have a compelling interest’.⁵⁰⁴ When the concurrent application of provincial legislation is not compatible with the application of federal legislation for the same subject matter, the doctrine of federal paramountcy applies, and federal legislation prevails. In this

⁵⁰⁰ Brendan Downey and others, ‘Federalism in the Patch: Canada’s Energy Industry and the Constitutional Division of Powers’ (2020) 58 Alberta Law Review 282. Hogg believes that such an extension, which is not stated in the Constitution Act, is not needed as it can be covered by the pith and substance doctrine and the wording of the Constitution Act “in relation to” matters includes incidental or ancillary power of the federal or provincial enacting body. Hogg (n 607) 407.

⁵⁰¹ *Canadian Western Bank v. Alberta*, 2007 SCC 22 (CanLII), [2007] 2 SCR 3.

⁵⁰² Hogg (n 497) 248.

⁵⁰³ *Canadian Western Bank v. Alberta* (n 501).

⁵⁰⁴ *British Columbia (Attorney General) v. Lafarge Canada Inc.*, 2007 SCC 23 (CanLII), [2007] 2 SCR 86.

case the provincial legislation is not operative to the extent that it is incompatible with federal legislation.⁵⁰⁵

Reading down is also a helpful interpretation technique that courts use to determine what falls exclusively into the jurisdiction of a given level of government.⁵⁰⁶ When jurisdictional disputes arise over natural resources, which includes energy production and distribution, and environmental protection, courts will adjudicate the conflicts through the interpretation of the Constitution Act provisions on the division of powers. Due to many potential instances of overlapping jurisdiction, there is still a lot of ambiguity and uncertainty over who can or should regulate aspects of OWE in Canada. Next, this section looks into the jurisdiction over natural resources, followed by a discussion on jurisdiction over environmental protection.

3.1.1 Jurisdiction Over Natural Resources

Federal and provincial jurisdiction over natural resources has remained unclear and complicated in Canada by federalism and pre-Confederation land claims. This doctoral research chose to spotlight Nova Scotia to allow for a complete analysis of how OWE regulation in Canada happens or will happen in practice, as many regulations will be at the provincial level. In the case of Nova Scotia, jurisdictional issues have an added layer of complexity as this province had historical and positive offshore regulatory actions before the Confederation. This section first examines the amendments to the Constitution Act 1867 concerning natural resources, which provided provinces primary jurisdiction to regulate natural resource exploitation in Canada. Despite these amendments, the

⁵⁰⁵ *Canadian Western Bank v. Alberta* (n 501).

⁵⁰⁶ *ibid* para 31.

uncertainty related to jurisdiction over natural resources remains because of the historical offshore claim of Nova Scotia. Finally, this section reviews relevant court cases to clarify Nova Scotia’s jurisdiction over offshore natural resources.

3.1.1.1 Jurisdiction Over Natural Resources Under the Constitution Act

Although the Constitution Act was amended in 1982 to expressly clarify jurisdiction over natural resources, uncertainties remain based on historical land claims and a lack of clear delineation of federal and provincial boundaries. Originally, the Constitution Act⁵⁰⁷ did not mention “natural resources” as a separate head of power. There were other types of federal powers related to resources and their management such as fisheries under subsection 91(12)⁵⁰⁸ and provincial power to legislate on the management and sale of timber and wood on public lands under subsection 91(5).⁵⁰⁹ There were also concurrent federal and provincial jurisdictions to legislate on agriculture under Section 95.⁵¹⁰ Subsection 92A(1) related to “natural resources” was added to the Constitution Act of 1867 in 1982 to grant provinces exclusive jurisdiction to legislate⁵¹¹ with respect to

- ‘(a) exploration for non-renewable natural resources in the province;
- (b) 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 therefrom; and

⁵⁰⁷ The Constitution Act (n 493).

⁵⁰⁸ *ibid* s 91(12).

⁵⁰⁹ *ibid* s 91(5).

⁵¹⁰ Carissima Mathen and Patrick Macklem (eds), *Canadian Constitutional Law* (Sixth Edition, Emond Publishing 2022) 391.

⁵¹¹ *ibid*; Robert D Cairns, Marsha A Chandler and William D Moull, ‘The Resource Amendment (Section 92A) and the Political Economy of Canadian Federalism’ (1985) 23 *Osgoode Hall Law Journal* 253.

(c) development, conservation and management of sites and facilities in the province for the generation and production of electrical energy.’⁵¹²

This amendment empowers provinces to legislate over exploration, development, and management of renewable energy in the province. Provinces have jurisdiction over the seabed and waters within their boundaries, which may extend to offshore areas under specific agreements (e.g., the Canada-Nova Scotia Offshore Petroleum Resources Accord). Typically, coastal provinces have jurisdiction over all land to the “low tide mark” (the level reached by the tide at low water), as well as all “inland waters,” meaning the area between headlands such as bays, harbors, and coves.⁵¹³ Provincial legislatures also have the law-making power over property and civil rights, which includes ownership over wind energy undertakings in the province.⁵¹⁴

In addition, the matters that are expressly excepted from the exclusive legislative jurisdiction of provinces shall be within the jurisdiction of the Parliament of Canada.⁵¹⁵ These include works and undertakings such as cables of OWE connecting a province to any other provinces or “extending beyond the Limits of the Province” or between a province and any other country, and the works that are for the “general advantage of Canada” or “for the Advantage of Two or more of the Provinces”.⁵¹⁶

However, the offshore boundaries of Canada and provinces depend on what they brought into the Confederation. Under Section 7 of the Constitution Act, ‘The Provinces

⁵¹² The Constitution Act (n 493) s 92A(1).

⁵¹³ ‘Frequently Asked Questions: Provincial Jurisdiction of British Columbia over Coastal and Ocean Matters’ <<https://www.wcel.org/sites/default/files/publications/2020-06-faq-provincialjurisdiction-coastal-updated.pdf>> accessed 17 December 2024.

⁵¹⁴ The Constitution Act (n 493) s 93(13).

⁵¹⁵ *ibid* s 91(29).

⁵¹⁶ *ibid* s 92(10)a,(b),(c).

of Nova Scotia and New Brunswick shall have the same limits as at the passing of this Act’, and it depends on what territory a province brought into Confederation.⁵¹⁷ Sometimes there is uncertainty over which OWE areas would be within or outside of the provinces’ regulatory powers. To respond more specifically to this uncertainty for the province of Nova Scotia, a review of court cases will provide insights into jurisdiction over these resources. Jurisdiction over OWE may, therefore, vary from province to province and from territory to territory, depending on specific constitutional agreements and court decisions.

3.1.1.2 Judicial Interpretation of Natural Resources Jurisdiction

This section analyzes relevant court decisions that address jurisdictional issues concerning natural resources. These decisions are important as they affect the conclusions related to Nova Scotia. It is essential to clarify two points before delving into the case analysis. First, courts have decided on cases related to federal and provincial jurisdiction over the territorial sea, EEZ, and continental shelf. They have not decided cases related to the ownership and jurisdiction over management of natural resources in internal waters, although it can be impliedly understood that internal waters, which are waters landward of low-water mark, are owned by provinces. Second, this section excludes discussions on the international aspects of internal waters, territorial sea, EEZ, and continental shelf. These will be examined in chapter four of this thesis.

3.1.1.2.1 Reference Re: Offshore Mineral Rights

In *Reference Re: Offshore Mineral Rights (1967)* the Supreme Court of Canada addressed the issue of ownership and jurisdiction over offshore lands and mineral rights between Canada and British Columbia. The Supreme Court of Canada held that ‘the lands,

⁵¹⁷ Doelle and others (n 126) 35.

including the mineral and other natural resources, of the sea bed and subsoil seaward from the ordinary low-water mark on the coast of the mainland and the several islands of British Columbia, outside the harbors, bays, estuaries and other similar inland waters, to the outer limit of the territorial sea of Canada' are the property of Canada.⁵¹⁸ Canada has the right to explore and exploit the said lands and has legislative jurisdiction in relation to the said lands.⁵¹⁹ In addition, the Supreme Court of Canada held that with respect to 'the mineral and other natural resources of the seabed and subsoil beyond that part of the territorial sea', Canada has 'the right to explore and exploit the said mineral and other natural resources'.⁵²⁰

This decision was based on the following grounds. Regarding the territorial sea, the court followed *Regina v. Keyn* in which the court set 'the common law rule that the territory of the realm ends at low-water mark and that territorial waters ...are not within the body of adjacent counties or of the realm' unless it is expressly claimed in special circumstances and a special Act.⁵²¹ British Columbia at no time, either before Confederation (as a colony) in 1871 or after that (as a province), had extended its jurisdiction over the territorial sea through legislation.⁵²² Concerning the continental shelf, there were no historical and constitutional bases for British Columbia to claim the right of legislation, exploration, and exploitation of resources of the continental shelf.⁵²³ In addition, Canada has exclusive jurisdiction to legislate for these lands under the residual power in Section 91. Section 91 provides that Parliament has the power 'to make Laws for the Peace, Order, and Good

⁵¹⁸ *Reference Re: Offshore Mineral Rights* [1967] CSR 792, 1967 CanLII 71 821.

⁵¹⁹ *ibid.*

⁵²⁰ *ibid* 822.

⁵²¹ *Regina v. Keyn* (1876), 2 Ex. D. 63 cited in *ibid* 806.

⁵²² *ibid* 793.

⁵²³ *ibid.*

Government of Canada, in relation to all Matters not coming within the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces'.⁵²⁴ Parliament also has sovereignty over the territorial sea and rights over the continental shelf under international law and must answer the claims of other states with respect to a breach of obligations under the agreed conventions.⁵²⁵

3.1.1.2.2 Reference re Newfoundland Continental Shelf

This case arose from a reference question posed to the Supreme Court of Canada regarding the ownership and jurisdiction over the continental shelf off the coast of Newfoundland and Labrador. Newfoundland claimed sovereignty over the natural resources of its adjacent continental shelf, arguing that such rights were inherent to it as a former British colony upon joining the Confederation in 1949. The federal government contested this claim, asserting that jurisdiction over the continental shelf belonged to Canada as a whole, based on the division of powers under the Constitution Act, 1867, and principles of international law. The questions were, therefore, whether Canada or Newfoundland has the right to explore and exploit mineral and other natural resources on the Newfoundland continental shelf and whether Canada or Newfoundland has jurisdiction to legislate with respect to these rights.⁵²⁶

The Supreme Court of Canada held that Canada, not provinces, has the right to explore and exploit natural resources on the continental shelf. The Supreme Court of Canada reasoned that Canada's continental shelf does not fall within the ambit of provincial

⁵²⁴ *ibid*; The Constitution Act (n 493) s 91.

⁵²⁵ *Reference Re: Offshore Mineral Rights* (n 518) 793.

⁵²⁶ *Reference Re Newfoundland Continental Shelf* 1984 CanLII 132 (SCC), [1984] 1 SCR.

powers under Section 92 of the Constitution Act⁵²⁷ ; the continental shelf is determined under international agreements that were originally signed by the Crown in the right of the UK, not by Newfoundland prior to the Union and passed to Canada in accordance with the terms of the Union.⁵²⁸ Canada also has jurisdiction to legislate in relation to these resources on the continental shelf based on ‘the peace, order, and good government power in its residual capacity’ (Section 91).⁵²⁹

The Supreme Court of Canada was not asked about the exploration and exploitation rights over natural resources and the right to legislate in relation to natural resources situated in (at the time three miles of) the territorial sea. The Newfoundland Court of Appeal did address this specific question,⁵³⁰ holding that the seabed resources of the narrow territorial sea off Newfoundland and Labrador, as a result of pre-1949 Imperial instruments and international law developments, belong to the province, meaning that Newfoundland has exploration and exploitation rights over natural resources and the right to legislate in relation to natural resources situated in the territorial sea.⁵³¹ It might be assumed that this decision is valid because it was not confirmed or reversed by the Supreme Court. However, scholars have cited *Ace-Atlantic Container Express Inc. v. The Queen (1992)*⁵³² in which

⁵²⁷ *ibid* 88.

⁵²⁸ *ibid* 87, 128.

⁵²⁹ *ibid* 128.

⁵³⁰ *Reference re Mineral and other Natural Resources of the Continental Shelf* (the Newfoundland Reference) (1983), 1983 CanLII 3089 (NL CA), 145 D.L.R. (3d) 9.

⁵³¹ Penick states that ‘By the reasoning of the Supreme Court of Canada set out in the British Columbia Offshore Reference and the Hibernia Reference, and taking into account the circumstances of the pre-Confederation colony of Nova Scotia, it will be virtually impossible to escape the conclusion that Canada, not Nova Scotia, holds the proprietary rights and legislative powers in the territorial sea and continental shelf off Nova Scotia.’ See Van Penick, ‘Legal Framework in The Canadian Offshore’ (2001) 24 Dalhousie LJ 15.

⁵³² *Ace-Atlantic Container Express Inc. v. The Queen* (1992), 92 D.L.R. (4th) 581 at 601 (Nfld. C.A.) [Atlantic Container Express Case]

the Newfoundland Court of Appeal subsequently found that the low water mark represents the boundary where the jurisdiction of the province ends, therefore Newfoundland territorial sea outside the low water mark is under federal jurisdiction.⁵³³ There are therefore some lingering uncertainties about jurisdiction over natural resources in territorial seas, although it will most likely belong to Canada.

3.1.1.2.3 Conclusion and Jurisdiction of Nova Scotia

The reasons provided in both *Reference Re Offshore Mineral Rights* and *Reference Re Newfoundland Continental Shelf* and the discussions above require Nova Scotia to demonstrate that it has a historical claim or positive legislation before Confederation over property and jurisdiction to legislate concerning the lands beyond the low-water mark⁵³⁴. It is debatable whether Nova Scotia can have a strong case for these areas and the use of seabed and waters in these areas to develop OWE.⁵³⁵

“Definitional uncertainties”, however, create ambiguity over provincial offshore jurisdictions.⁵³⁶ The jurisdiction of provinces under common law in relation to waters “inter fauces terrae” (between the jaws of land) are considered inland waters and under provincial jurisdiction.⁵³⁷

⁵³³ Doelle and others (n 126) 39.

⁵³⁴ Lands beyond the low-water mark include the territorial sea and exclusive economic zone and/or the continental shelf.

⁵³⁵ Penick (n 531) 15. Penick concludes:

‘By the reasoning of the Supreme Court of Canada set out in the British Columbia Offshore Reference and the Hibernia Reference, and taking into account their circumstances of the pre-Confederation colony of Nova Scotia, it will be virtually impossible to escape the conclusion that Canada, not Nova Scotia, holds the proprietary rights and legislative powers in the territorial sea and continental shelf off Nova Scotia.’

⁵³⁶ David VanderZwaag, *Canada and Marine Environmental Protection: Charting a Legal Course Towards Sustainable Development* (Kluwer Law International 1995) 297.

⁵³⁷ *Reference Re: Offshore Mineral Rights* (n 518) 810.

Nova Scotia might still argue for provincial jurisdiction over a three-mile territorial sea. For example, Foley has noted that Nova Scotia's case has a different history from British Columbia, and it appears that it has valid jurisdiction and ownership over a three-mile territorial sea based on the following evidence:

i) The grant of the territory of Nova Scotia by James I to Sir William Alexander, which included the land and territorial sea;

ii) Treaties, conventions, and maps which included fisheries on the Scotian Shelf as an extension of the territory of Nova Scotia;

iii) Exercising jurisdiction over the time three nautical miles of territorial sea and three miles of the coast, bays, and harbors by the Nova Scotia government through the enactment of statutes regarding fishing and smuggling, permitting mineral resources and recognition of such jurisdiction by Nova Scotian courts.⁵³⁸

In addition, it seems that the Bay of Fundy is regarded as part of inland waters and the territories of New Brunswick and Nova Scotia based on substantial historical evidence.⁵³⁹ Accordingly, the jurisdiction to legislate regarding the seabed and waters in the Bay of Fundy may fall within the provincial jurisdiction.

3.1.2 Jurisdiction Over Environmental Matters

The question of who has jurisdiction to legislate in relation to the environment is relevant to the environmental impacts of OWE activities. Firstly, OWE projects interact with onshore areas. OWE projects include cables, laying from offshore sites to onshore

⁵³⁸ Edward C Foley, 'Nova Scotia's Case for Coastal and Offshore Resources' (1981) 13 *Ottawa Law Review* 281, 285, 295, 296, 298, 299, 300.; See also *Dominion Coal C v Cape Breton (County)* (1963), 48 MPR 174, 40 DLR (2nd) 593 (NSCA); For cases related to provincial jurisdiction of Newfoundland, see *Re Mineral and Other Natural Resources of the Continental Shelf* (1983), 41 Nfld. & PEIR 271, 145 DLR (3rd) 9 (Nfld CA).

⁵³⁹ *Doelle and others* (n 126) 40.

facilities for internal consumption or supply of electricity needed in the production process of green hydrogen. Secondly, certain OWE plans may fall within provincial jurisdiction. For example, the governments of Canada and Newfoundland and Labrador recently signed a memorandum of understanding on OWE to be developed within the inland bays of Newfoundland.⁵⁴⁰ Thirdly, and more importantly, as discussed in chapter two, OWE projects can have significant environmental impacts. Such impacts, which do not recognize the legal and political boundaries, may cause cumulative effects or significant ecological risks in the long term that need to be regulated, making jurisdiction over the environment relevant to this legal discussion.

The Constitution Act 1867 does not contain any provisions with respect to the legislative jurisdiction over the environment.⁵⁴¹ In the absence of jurisdiction for law-making regarding the environment, this thesis will examine how courts interpreted this jurisdiction to illuminate which level of government may have jurisdiction over adverse

⁵⁴⁰ Natural Resources Canada, 'Governments of Canada and Newfoundland and Labrador Sign Memorandum of Understanding to Advance Offshore Wind Power and Good Jobs' (6 December 2023) <<https://www.canada.ca/en/natural-resources-canada/news/2023/12/governments-of-canada-and-newfoundland-and-labrador-sign-memorandum-of-understanding-to-advance-offshore-wind-power-and-good-jobs.html>> accessed 11 December 2023.

⁵⁴¹ The current thesis is not about reforming the Constitution Act, but concern should be raised about the weaknesses of this Act to support ecological sustainability. Additional research is needed to work on this gap. For further discussions, see Mohamad Alikhani, 'Offshore Wind in Canada #3: The Environmental Jurisdiction' (6 May 2024) <<https://blogs.dal.ca/openthink/offshore-wind-in-canada-3-the-environmental-jurisdiction/>> accessed 7 May 2024; Lynda Collins, *The Ecological Constitution* (Routledge 2021); Lynda Collins, 'The Unwritten Constitutional Principle of Ecological Sustainability: A Solution to the Pipelines Puzzle?' (2019) 70 UBLJ 30; Lynda M Collins, 'Safeguarding the Longue Durée: Environmental Rights in the Canadian Constitution' (2015) 71 The Supreme Court Law Review: Osgoode's Annual Constitutional Cases Conference <<https://digitalcommons.osgoode.yorku.ca/sclr/vol71/iss1/20>> accessed 25 March 2024; Lynda M Collins and Lorne Sossin, 'In Search of an Ecological Approach to Constitutional Principles and Environmental Discretion in Canada' (2019) 52 UBC L Rev 293; Lynda M Collins, 'Constitutional Eco-Literacy in Canada: Environmental Rights and Obligations in the Canadian Constitution' (2022) 26 Review of Constitutional Studies 227; Lynda Collins, 'An Ecologically Literate Reading of the Canadian Charter of Rights and Freedoms' (2009) 26 Windsor Review of Legal and Social Issues 7; David R Boyd, *Cleaner, Greener, Healthier: A Prescription for Stronger Canadian Environmental Laws and Policies* (UBC Press 2015); David R Boyd, *The Right to a Healthy Environment Revitalizing Canada's Constitution* (UBC Press 2012).

environmental impacts of OWE. When disputes over provincial and federal jurisdictions arise around the legislative power to enact environmental laws and regulations, courts have linked the environmental matters to other matters within the ambit of Sections 91 and 92 of the Constitution Act.

Generally, the courts have taken the view that as environmental issues cut across various matters and heads of powers, they should be considered shared jurisdiction between federal and provincial legislations. The Supreme Court of Canada in a key decision on the federal and provincial legislative jurisdiction held that the environment is not recognized as an independent matter under the Constitution Act, and it is an abstruse matter of legislation that may fall under different heads of power or both federal and provincial jurisdictions.⁵⁴² The environment is a “diffuse subject”, the environmental concerns differ, and there are several heads of power under the Constitution Act, hence, such concerns may relate to different heads of power.⁵⁴³

Section 92 of the Constitution Act enumerates provincial powers such as property and civil rights⁵⁴⁴, natural resources⁵⁴⁵, and local works and undertakings⁵⁴⁶, which enables provinces to regulate environmental matters related to land use, forestry, water resources, energy projects, and pollution control within their boundaries. Provinces play a significant role in enforcing environmental legislation, issuing permits, and conducting environmental

⁵⁴² *Friends of the Oldman River Society v. Canada (Minister of Transport)*, 1992 CanLII 110 (SCC), [1992] 1 SCR 39, 64.

⁵⁴³ *ibid* 67.

⁵⁴⁴ The Constitution Act (n 493) s 93(13).

⁵⁴⁵ *ibid* s 92(A).

⁵⁴⁶ *ibid* s 92(10).

assessments for projects under their jurisdiction, and that may include activities related to OWE.

However, since environmental protection is shared jurisdiction, some matters fall under federal heads of power. For example, the disputes over the protection of fisheries are considered under the Parliament's jurisdiction based on subsection 91 (12) of the Constitution Act,⁵⁴⁷ while the pith and substance of an environmental prohibition under an Act may fall within the criminal power of the Parliament under subsection 91(27) of the Constitution Act.⁵⁴⁸

Courts have also applied the national concern doctrine of Peace, Order, and Good Government (POGG) under Section 91 to cases where a new matter created problems beyond the limits of a province or was considered an advantage for the whole of Canada. For example, regulation of marine pollution under the relevant Act could not fall within any heads of federal jurisdictions under Section 91 of the Constitution Act. It could not fall within the scope of seacoast and inland fisheries under subsection 91 (12) as "it is not the only effect of such pollution", hence, the court found that this issue can fall within the "national concern doctrine" under the POGG.⁵⁴⁹ Similarly, the federal Greenhouse Gas

⁵⁴⁷ *Northwest Falling Contractors Ltd. v. The Queen*, 1980 CanLII 210 (SCC), [1980] 2 SCR 292, 293; *Fowler v. The Queen*, 1980 CanLII 201 (SCC), [1980] 2 SCR, 213, 214.

⁵⁴⁸ *R. v. Hydro-Québec*, 1997 CanLII 318 (SCC), [1997] 3 SCR 213, 215–216.

⁵⁴⁹ *R. v. Crown Zellerbach Canada Ltd.*, 1988 CanLII 63 (SCC), [1988] 1 SCR 401. The Supreme Court of Canada in this case defined national concern doctrine as a doctrine that is different from national emergency doctrine, and applies to two scenarios: i) New matters that did not exist at Confederation, and ii) Matters, that were originally a local or private matter, but become a matter of national concern. Such matters must meet the criteria of "singleness, distinctiveness, and indivisibility" to be distinguished from matters of provincial concern and could be reconciled with the distribution of power under the constitution. To meet the criteria, a matter must affect extra-provincial interests or Canada as a whole and be of an international character such as marine pollution that cannot be controlled or regulated by a province.

Pollution Pricing Act⁵⁵⁰ regarding minimum national limits of carbon price stringency was upheld as a matter of national concern, hence, it was considered constitutionally valid under the POGG clause of Section 91 of the Constitution Act.⁵⁵¹ There is therefore a basis to argue that adverse environmental problems related to OWE projects may be classified as federal jurisdiction under POGG national concern.

3.1.3 Extending Joint Federal-Provincial Management Regime to Renewable Energy

The jurisdictional uncertainties on the exploitation of offshore resources have been a leading factor in federal-provincial disputes. After the political negotiations between Newfoundland and Ottawa concerning the management of resources in the offshore area of Newfoundland failed, the parties resorted to the court, which led to the decision in *Reference re Newfoundland Continental Shelf* case. That Supreme Court of Canada opinion, as explained in section 3.1.1.2.2 of this thesis, was in favor of the federal exercise of legislative power and the right to explore and exploit natural resources on the continental shelf of Newfoundland.

The dispute between the parties could not operationalize how offshore resources should be exploited. The division of powers between the Parliament and the provincial legislatures under the Constitution Act and the reluctance of the federal government to proceed with unilateral exploitation of resources led to a coordinated framework under the

⁵⁵⁰ Greenhouse Gas Pollution Pricing Act, SC 2018, c 12, s 186. The constitutionality of part 1 of this Act on the pricing certain fuel producers, distributors, and importers, and part 2 on the pricing GHG emissions of facilities beyond the applicable efficiency standards were disputed.

⁵⁵¹ *References Re Greenhouse Gas Pollution Pricing Act*, 2021 SCC 11 (CanLII).

Atlantic Accord that the Governments of Canada and Newfoundland signed in 1985.⁵⁵² Nova Scotia, which had signed an agreement with the Government of Canada concerning the joint management of offshore areas of Nova Scotia, exercised a “most favored province” right under this agreement and signed a revised Canada-Nova Scotia Offshore Petroleum Resources Accord on August 26, 1986.⁵⁵³ The long-term management regime, based on a compromise between both governments, became a foundation for legislation under the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act⁵⁵⁴ and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act⁵⁵⁵ (Accord Acts).

The Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act defines the Offshore Area and describes other limits, which have jurisdictional implications. Under this Act, Offshore Area includes the lands and submarine areas within the limits described in Schedule I.⁵⁵⁶ These areas are under the joint federal-provincial jurisdiction. The Bay of Fundy is also defined as submarine areas within the limits described in Schedule II.⁵⁵⁷ Although the Bay of Fundy is not included in Schedule I, it can be understood from the references to land points and mid-point with New Brunswick that most of the Bay of Fundy is included in the definition of Offshore Area.⁵⁵⁸ There are some

⁵⁵² Angus Taylor and Jim Dickey, ‘Regulatory Regime: Canada-Newfoundland/Nova Scotia Offshore Petroleum Board Issues’ (2001) 24 Dalhousie LJ 51, 54; Shawn Denstedt and RJ Thrasher, ‘The Accord Acts Twenty Years Later’ (2007) 30 Dalhousie LJ 287, 289.

⁵⁵³ J Marshall Burgess, ‘Effective and Efficient Regulation in Nova Scotia’ (2003) 26 Dalhousie LJ 303, 316; ‘Canada-Nova Scotia Offshore Petroleum Accord’ (1986) <<https://www.cnsopb.ns.ca/sites/default/files/resource/accord.pdf>> accessed 3 April 2024.

⁵⁵⁴ Canada–Newfoundland and Labrador Atlantic Accord Implementation Act (n 134).

⁵⁵⁵ Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (n 67).

⁵⁵⁶ *ibid* s 2 and sch I.

⁵⁵⁷ *ibid* s 2 and sch II.

⁵⁵⁸ *ibid* sch I.

exceptions in Schedule I, including bays and basins that are internal waters.⁵⁵⁹ The Minas Basin is one of those exceptions that is not included in the Offshore Area, but the rest of the Nova Scotian part of the Bay of Fundy is included in the Offshore Area.⁵⁶⁰ Also, Schedule II provides a metes and bounds description of the outer limit of the Bay.⁵⁶¹ The map below helps to get a general idea of the boundaries of Canada-Nova Scotia's jurisdiction over offshore petroleum resources (Figure 5).⁵⁶²

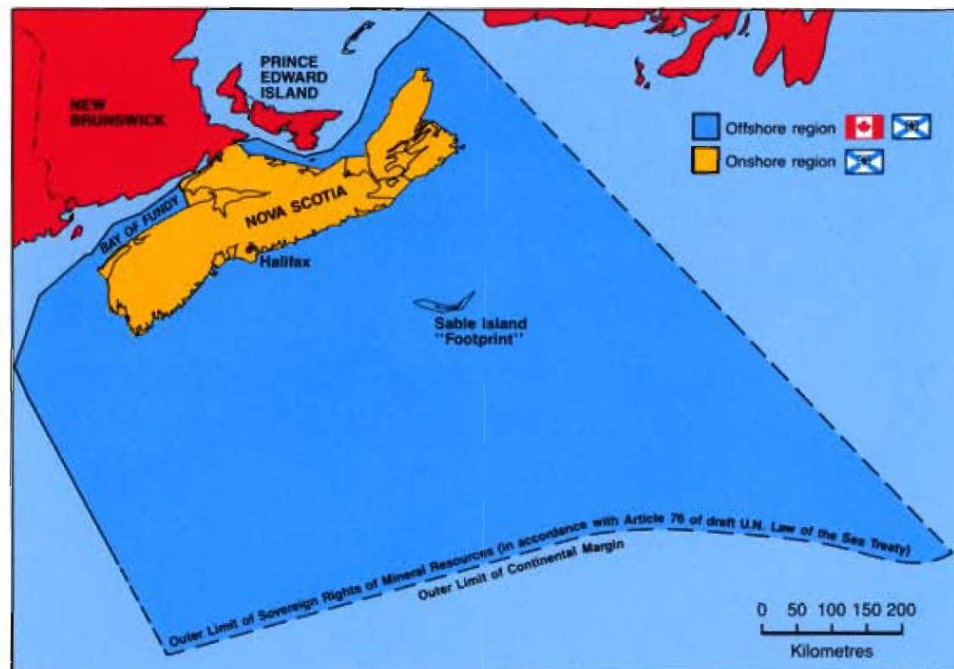


Figure 5- The boundaries of Canada-Nova Scotia's jurisdiction over offshore

As a result of passing the Accord Acts, the Canada–Newfoundland Offshore Petroleum Board and the Canada–Nova Scotia Offshore Petroleum Board (Boards) were

⁵⁵⁹ *ibid.*

⁵⁶⁰ *ibid.*

⁵⁶¹ *ibid* sch II.

⁵⁶² Petroleum Resources Section of Nova Scotia Department of Natural Resources, 'Petroleum Resources Offshore and Onshore Nova Scotia Canada' <<https://novascotia.ca/natr/meb/data/pubs/ic/ic23.pdf>> accessed 6 November 2024.

established with particular mandates. The Boards have several functions which, among others, include management and conservation of petroleum resources, issuing and administering licenses for exploration, development, and exploitation of petroleum resources in offshore areas, administering statutory requirements under the law, monitoring, and enforcement activities to ensure regulatory compliance, health and safety of offshore workers, and protection of the environment.⁵⁶³

The Boards' mandates were expanded in the 2024 Act to include renewable energy.⁵⁶⁴ The 2024 Act amended the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act in order to make the following changes.⁵⁶⁵

The word “petroleum” in the titles of the Act changes to include “offshore renewable energy”, which makes their titles ‘the Canada–Newfoundland and Labrador Atlantic Accord Implementation and Offshore Renewable Energy Management Act and the Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation and Offshore Renewable Energy Management Act’.⁵⁶⁶

The governing boards also change from ‘the Canada–Newfoundland and Labrador Offshore Petroleum Board and the Canada-Nova Scotia Offshore Petroleum Board to Canada–Newfoundland and Labrador Offshore Energy Regulator and the Canada–Nova

⁵⁶³ ‘What We Do’ (*Canada-Nova Scotia Offshore Petroleum Board (CNSOPB)*, 18 September 2018) <<https://www.cnsopb.ns.ca/what-we-do>> accessed 2 April 2024.

⁵⁶⁴ An Act to Amend the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to Make Consequential Amendments to Other Acts (n 68).

⁵⁶⁵ *ibid.*

⁵⁶⁶ *ibid* summary.

Scotia Offshore Energy Regulator’, which are regulating bodies and respectively, the 2024 Act calls them “the Regulators”.⁵⁶⁷

The 2024 Act also provides for other matters such as the seabed licensing regime and its decision-making processes, the regime for project revenues, some provisions for safety and environmental protection, prohibition of performing projects in environmental or wildlife conservation or protection areas whether identified at the beginning or found later at the time of implementation, and alignment with the Impact Assessment Act.

Advantages and concerns about the 2024 Act were discussed during the second reading of the House of Commons. The discussions stated that the main advantages of the 2024 Act would be to: i) Help address climate change, which is provoking negative impacts in Nova Scotia (wildfires, floods, ...); ii) Create job opportunities for people in Atlantic Canada who have been seeking jobs and have to relocate to other provinces, where there are more job opportunities in the energy sector; iii) Maintain energy security and makes Canada politically resilient against Russia, while taking opportunities and exporting green hydrogen to allies in Europe (Germany); iv) Phase out the oil and gas industry gradually; and v) Attract investment.⁵⁶⁸

In contrast, some concerns about the 2024 Act were stated: i) Failure to provide clear timelines and a regulatory framework for attracting investments for Canada, leaving it behind other countries in attracting investments for the energy sector; ii) Lack of enough consideration for environmental and social impacts of renewable energy; and iii)

⁵⁶⁷ *ibid.*

⁵⁶⁸ ‘Bill C-49, An Act to Amend the Canada-Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to Make Consequential Amendments to Other Acts’ Second Reading, House of Commons Debates, 44-1, No 220 (19 September 2023).

Confirming the current framework and hidden support for the development of oil and gas projects.⁵⁶⁹

From these concerns, the Acts and the 2024 Act provide very limited jurisdiction to regulate the environmental impacts of OWE.⁵⁷⁰ The environmental impacts, which might have inter-jurisdictional effects, are uncertain. In other words, an OWE project may extend from offshore to onshore areas and this offshore-onshore interaction is not specifically clarified in the 2024 Act. It is not clear what mechanisms are applied in terms of environmental approvals and plans. This issue is not new, and the Acts have not been clear on how inter-jurisdictional matters related to projects are decided. For example, the Acts are silent concerning onshore to offshore directional drilling for the exploitation of petroleum resources.⁵⁷¹

In addition, it appears that one of the original intentions for establishing the Boards was to manage or reduce jurisdictional uncertainties. The Boards were supposed to act as a “one-stop shop” authority or “one window approach”, but this function has changed by parallel statutory requirements of getting approvals.⁵⁷² The Boards can conclude the memorandum of understanding with federal or provincial governmental authorities under Section 46 of the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act to ensure effective coordination and avoid duplication of work and activities.⁵⁷³ For example, the memorandum of understanding was employed between the

⁵⁶⁹ *ibid.*

⁵⁷⁰ All these concerns are not within the scope of this thesis to be addressed. Of relevance to this thesis from such concerns is environmental protection.

⁵⁷¹ Taylor and Dickey (n 552) 62.

⁵⁷² Burgess (n 553) 320.

⁵⁷³ Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (n 67) s 46.

province of Nova Scotia, the Canada-Nova Scotia Offshore Petroleum Board, DFO, Environment Canada, Industry Canada, the National Energy Board (NEB), and the Canadian Environmental Assessment Agency in 2001 to simplify environmental approval of the Deep Panuke Project.⁵⁷⁴ However, the contents of the memorandum of understanding are general⁵⁷⁵ and lack a clear mechanism on how different issues such as approval processes and delegation of authorities (if any) are gone through.⁵⁷⁶

In addition to uncertainties embedded in the memorandum of understanding, the current jurisdiction to make regulations under the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act is limited. The Governor in Council has limited discretion to only make regulations on ‘prohibiting the introduction into the environment of substances, classes of substances and forms of energy, in prescribed circumstances’,⁵⁷⁷ and does not have any room for making timely regulations on the environmental effects of OWE. Other provisions of this Act provide reactive responses to environmental issues rather than providing jurisdiction to take appropriate preventive measures. For example, subsection 59(1) allows the Canada-Nova Scotia Petroleum Board to prohibit any interest

⁵⁷⁴ Burgess (n 553) 338.

⁵⁷⁵ Exchange of information with Impact Assessment Agency, promotion of environmental protection and conservation in coordination with Environment and Climate Change Canada, and coordination and collaboration with Fisheries and Oceans Canada on the implementation of integrated management plans for marine and coastal waters are among the cooperative activities between the Board and the governmental authorities. Also, under subsections 46 (a) & (f), environmental regulations and trunklines are among the matters that can be the subject of the memorandum of understanding. See ‘Legislation and Regulatory Instruments’ (*Canada-Nova Scotia Offshore Petroleum Board (CNSOPB)*, 30 July 2019) <<https://www.cnsopb.ns.ca/regulatory-framework/legislation-and-regulatory-instruments>> accessed 3 April 2024; Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (n 67) ss 46 (a) & (f).

⁵⁷⁶ Burgess (n 553) 322.

⁵⁷⁷ Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (n 67) s 153(1)(g).

owner from commencing or continuing any work or activity on all or a portion of the offshore area if “an environmental or social problem of a serious nature” occurs.⁵⁷⁸

Regarding impact assessments, there is a similar concern related to uncertainties regarding jurisdiction over environmental effects. The mutual environmental effects of activities in federal and provincial jurisdictions and their cumulative effects have been subject to judicial review over the years.⁵⁷⁹ On the one hand, a condition of authorization by the Boards is compliance with the provisions that can be established under Section 64 and subsection 112(1)(a.2) of the Impact Assessment Act.⁵⁸⁰ On the other hand, the 2024 Act creates an opportunity for additional assessments by granting permission to Regulators to conduct regional assessments of the effects of any existing or future offshore renewable energy activities or to conduct strategic assessments of any proposed or existing policy, plan, program, or proposed or existing projects related to the offshore area.⁵⁸¹ However, if such an assessment is intended to be a separate assessment from the assessment under the Impact Assessment Act, the framework of the assessment including the procedure, terms and conditions, and factors contributing to the determination is not clear.

Finally, the 2024 Act acknowledges that the Boards’ authority in licensing decision-making is limited to the specified mandates and is subject to limitations and approvals of other laws. Under the 2024 Act, OWE foundations or structures attached to the seabed can be included in the definition of offshore renewable energy. The Canada–

⁵⁷⁸ *ibid* s 59(1).

⁵⁷⁹ Judith Hanebury, ‘Cooperative Environmental Assessments: Their Increasing Role in Oil and Gas Projects’ (2001) 24 *Dalhousie LJ* 87, 92; ‘Reference Re Impact Assessment Act’ (2023) 2023 SCC 23.

⁵⁸⁰ For further discussions, see section 3.2.1.7 of this thesis.

⁵⁸¹ An Act to Amend the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to Make Consequential Amendments to Other Acts (n 68) s 138.017(1) and s 138.018(1).

Newfoundland and Labrador Offshore Energy Regulator and the Canada–Nova Scotia Offshore Energy Regulator will have the authority to issue submerged land licenses for any part of offshore areas of these provinces.⁵⁸² This license confers the OWE project owner the right to carry on the OWE project in the license area in accordance with the terms and conditions of the license.⁵⁸³ The 2024 Act particularly provides that any work or activity related to offshore renewable energy (including OWE) is prohibited unless authorization is issued before the commencement of the project.⁵⁸⁴ The authorization is subject to the terms and conditions required by the Regulator.⁵⁸⁵ One of the conditions for such authorizations is “approvals”.⁵⁸⁶ It is not clear what approvals are intended to be included in the terms and conditions. The general meaning of this word may refer to all approvals, permits, authorizations, and licenses that are required under any federal and provincial laws and regulations (including, but not limited to, those laws and regulations that are identified in the next sections of this thesis).

3.2 Current Canadian Laws and Policies Applicable to OWE

This section adopts a conventional legal method to review key laws and policies in Canada and Nova Scotia (as an example). These laws apply to permitting the development of OWE and regulating its environmental impacts. Beyond merely outlining applicable laws, this review identifies gaps, uncertainties, and areas needing attention in decision-making, policy formulation, or legal reform. Ecological sustainability is central in this

⁵⁸² *ibid* s 88(1).

⁵⁸³ *ibid* s 89.

⁵⁸⁴ *ibid* ss 137.01 and 138.01(1).

⁵⁸⁵ *ibid* s 138.01(3).

⁵⁸⁶ *ibid* s 138.01(a).

review, emphasizing laws and regulations related to ecosystem components (such as fisheries, birds, and species at risk). Based on this theoretical framework, the analysis highlights provisions concerning ecological integrity, marine protected areas, marine integrated management, and ecosystem components and underscores their role and importance when it comes to the development of OWE.

In addition to reviewing applicable laws and regulations to OWE, it is essential to keep in mind that reviewing key federal policies is crucial as they provide the framework within which OWE projects will be shaped. The policies and strategies also play a role in setting the objectives and principles that guide decision-making regarding OWE projects. They are particularly helpful in directing what activities should be permitted to achieve the objectives and whether they are consistent with the principles.

Accordingly, this review will first address the main laws and policies at the federal level, then select key laws of Nova Scotia as an example. Finally, this section will reflect on the legal aspects related to Indigenous peoples.

3.2.1 Federal Policy and Regulatory Framework

The focus of this section is to review laws and policies at the federal level. First, laws and policies applicable to permitting processes to OWE and the likely environmental impacts of OWE projects on the environment and stakeholders will be reviewed. This review will include the identification of gaps and weaknesses in laws and policies. Second, policies and programs that can be relevant to various Acts or cannot be identified under a specific Act will be discussed. These latter policies or programs will be examined under the subtitle of cross-cutting policies.

3.2.1.1 The Oceans Act and the Related Policies and Plans

3.2.1.1.1 The Oceans Act

Canada enjoys sovereign rights to develop OWE in the EEZ. Canada's sovereign rights in the EEZ are recognized in the Oceans Act and it can perform exploration and exploitation activities such as the production of energy from winds.⁵⁸⁷ Canada also has jurisdiction in the EEZ on the establishment of installations and structures and the protection and preservation of the marine environment.⁵⁸⁸ Hence, Canada has jurisdiction to legislate with respect to the development of OWE and relevant environmental impacts in the EEZ and continental shelf of Canada under this Act.

It is critically important that OWE projects are designed within the integrated management plans of oceans. The Oceans Act aims to support the implementation of the integrated management of oceans and marine resources,⁵⁸⁹ and OWE projects need to be formulated in the context of marine integrated planning. Specifically, under the Oceans Act, the Minister of Fisheries and Oceans is the leading authority to develop and implement a national strategy to manage marine ecosystems in collaboration with other governmental bodies, stakeholders, and coastal communities.⁵⁹⁰ The Oceans Act has identified three principles on which a national strategy should be based: (a) sustainable development; (b) the integrated management of activities in estuaries, coastal, and marine waters; and (c) the

⁵⁸⁷ Oceans Act (n 246) s 14 (a). The definition of "marine installation or structure" under Section 2 of the Oceans Act, which includes "subsea installations" and the activities and facilities (e.g. cables) connected to such installations, applies to OWE. In addition, subsection 20(1)(a) of the Oceans Act, which is related to the marine installation or structure attached to the continental shelf of Canada to explore or exploit its mineral or other non-living resources, can be interpreted to be applied similarly to OWE foundations.

⁵⁸⁸ *ibid* s 14(b)(i) & (iii).

⁵⁸⁹ *ibid* preamble.

⁵⁹⁰ *ibid*.

precautionary approach.⁵⁹¹ The Minister of Fisheries and Oceans must ‘lead and facilitate the development and implementation of plans for the integrated management of all activities or measures in or affecting estuaries, coastal waters and marine waters that form part of Canada or in which Canada has sovereign rights under international law’.⁵⁹² For the purposes of integrated management, the Minister of Fisheries and Oceans has wide powers such as developing and implementing policies and programs and coordinating with other governmental bodies and stakeholders.⁵⁹³ Therefore, it rests within the power of the Minister of Fisheries and Oceans to coordinate between different governmental authorities, stakeholders, and communities. Such coordination could help ensure OWE projects and their impacts are managed based on sustainable development, integrated management, and precautionary principles.

It is also important that OWE sites do not affect marine protected areas. The Oceans Act provides that an area of the sea can be designated as a “marine protected area”⁵⁹⁴ for the conservation and protection of fishery resources and their habitats, endangered or threatened marine species and their habitats, unique habitats, marine areas of high biodiversity and biological productivity, any other resources or habitats at the discretion of the Minister, and marine areas for the purpose of maintaining ecological integrity.⁵⁹⁵ The Oceans Act defines “ecological integrity” as ‘a condition in which (a) the structure, composition and function of ecosystems are undisturbed by any human activity; (b) natural

⁵⁹¹ *ibid* s 30.

⁵⁹² *ibid* s 31.

⁵⁹³ *ibid* s 32.

⁵⁹⁴ Currently, there are 14 Oceans Act marine protected areas in Canada. See Fisheries and Oceans Canada Government of Canada, ‘Marine Protected Areas across Canada’ (22 November 2019) <<https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/index-eng.html>> accessed 24 November 2024.

⁵⁹⁵ Oceans Act (n 246) s 35(1).

ecological processes are intact and self-sustaining; (c) ecosystems evolve naturally; and (d) an ecosystem's capacity for self-renewal and its biodiversity are maintained.⁵⁹⁶ To designate a marine protected area, the Minister recommends an area for designation, and the Governor in Council designates such an area. When an area is identified as a marine protected area, the planning of the OWE projects might be affected. Therefore, an appropriate selection of OWE sites is important in achieving the ecological integrity of marine areas, which is a cornerstone of ecological sustainability.

In determining site selection, the degree of legal protection varies in marine protected areas, but strong protection is needed to preserve ecological sustainability. The level of protection may vary from weak protection that is partially protective and allows exploitation activities (e.g. fishing, mining, and oil and gas) to strong protection that does not permit these activities and only allows limited ones such as recreational fishing.⁵⁹⁷ For example, the Gully Marine Protected Area off Nova Scotia and St. Anns Bank Marine Protected Area are designated under the Oceans Act and established under the regulations. In the Gully Marine Protected Area Regulations,⁵⁹⁸ certain activities are prohibited. It is forbidden to (i) Disturb, damage, or destroy in this area or remove from it, any living marine organisms, their habitats, and any part of the seabed, or (ii) Carry out activities or cause certain activities such as disposing, discharging, or dumping any substance that is likely to result in damage, destruction, or removal of living marine organisms, their habitats, or seabed of this area.⁵⁹⁹ However, certain types of exceptions can be permitted

⁵⁹⁶ *ibid* s 35(1.1).

⁵⁹⁷ Jane Lubchenco and Kirsten Grorud-Colvert, 'Making Waves: The Science and Politics of Ocean Protection' (2015) 350 *Science* 382.

⁵⁹⁸ The Gully Marine Protected Area Regulations, SOR/2004-112.

⁵⁹⁹ *ibid* s 4(a), (b) & (c); St. Anns Bank Marine Protected Area Regulations, SOR/2017-106, s 4.

such as scientific research or monitoring activities, licensed commercial fishing, which causes damage in some specifically identified zones of these areas, shipping under certain conditions, and activities for public safety, law enforcement, and national security.⁶⁰⁰ A strong protection requires a baseline prohibition, restricting activities such as bottom trawl fishing, and oil and gas development inconsistent with marine biological integrity.⁶⁰¹ The current footprint within marine protected areas is also frozen and new activities are not permitted.⁶⁰²

Similarly, OWE activities should not be permitted to be constructed in marine protected areas. OWE activities may disturb, damage, or destroy these areas or may remove any living marine organisms, their habitats, and any part of the seabed, from such areas. OWE activities may also lead to disposing, discharging, or dumping any substance that is likely to harm living marine organisms, their habitats, or the seabed of marine protected areas. Therefore, marine protected areas should be avoided when OWE sites are planned.

In addition, the OWE site selection should be seen within the wider picture to match other pieces of competing marine interests through MSP. The site selection should not undermine marine biodiversity objectives set nationally and internationally for Canada and the key desirable actions for achieving these objectives. Such actions include the identification of “biodiversity hotspots and vulnerable biological habitats”, the establishment of “a comprehensive and biologically meaningful network of MPAs”, and the development of “marine spatial planning with clear geographical priorities, explicit

⁶⁰⁰ St. Anns Bank Marine Protected Area Regulations (n 599) ss 8, 10 and 11; *ibid* ss 5, 6 and 7.

⁶⁰¹ Maryann S Watson and Stephanie M Hewson, ‘Securing Protection Standards for Canada’s Marine Protected Areas’ (2018) 95 *Marine Policy* 117, 118.

⁶⁰² Anna-Maria Hubert and Stuart Gray, ‘Area-Based Marine Protection in Canada’ (2020) 5 *Asia-Pacific Journal of Ocean Law and Policy* 142, 153.

timelines, and transparent measures for public reporting”.⁶⁰³ The Oceans Act provides the possibility that marine protected areas are designated through regulations or ministerial orders and are conserved to maintain ecological integrity and establish networks of protected areas.⁶⁰⁴ If there are existing marine protected areas or there are plans to designate these areas under this Act, OWE activities should not jeopardize these areas or plans.

3.2.1.1.2 Policies, Plans, and Other Initiatives under the Oceans Act

3.2.1.1.2.1 The Oceans Strategy

Canada’s Oceans Strategy provides general guidance for resolving the potential conflicts between marine uses and ecosystems, which is essential for planning and developing OWE. Such guidance can be drawn from i) Aims, ii) Principles, and iii) Integrated management as a key tool.

Aims

The conflict between OWE and other marine uses should be reduced in light of the aims of the Oceans Strategy. The aims include ‘understanding and protecting the marine environment, supporting sustainable economic opportunities, and providing international leadership’.⁶⁰⁵

Principles

Canada’s Oceans Strategy also provides helpful principles to guide activities and reduce user-user conflicts and user-environment conflicts. Conducting the cumulative

⁶⁰³ Jeffrey A Hutchings and others, ‘Sustaining Canadian Marine Biodiversity: Policy and Statutory Progress’ (2020) 5 FACETS 264, 269.

⁶⁰⁴ Oceans Act (n 246) s 35.

⁶⁰⁵ Canada’s Oceans Strategy (n 65) 12.

assessment of human activities in ocean management and integrated management,⁶⁰⁶ and adopting a precautionary approach in the sustainable development of activities⁶⁰⁷ are among the helpful considerations. For example, the Strategy reaffirms its commitment to ‘promoting the wide application of the precautionary approach to the conservation, management, and exploitation of marine resources to protect these resources and preserve the marine environment’.⁶⁰⁸

Integrated Management as a Key Tool

Integrated management is central to the Oceans Strategy and can guide how OWE should be planned in a bigger picture. Integrated management includes some principles and concepts such as integrated data gathering and monitoring, collaborative ocean governance structures and processes, adaptive management, and planning.⁶⁰⁹ The Strategy defines the characteristics and objectives of a desirable integrated management as follows:

Integrated Management involves comprehensive planning and managing of human activities to minimize the conflict among users. It also involves a collaborative approach and a flexible and transparent planning process that respects existing divisions of constitutional and departmental authority and does not abrogate or derogate from any existing Aboriginal or treaty rights.⁶¹⁰

Integrated management is an effective method that supports ecological sustainability. The Oceans Strategy confirms that ecosystems have open boundaries, which are influenced by different natural disturbances such as the invasion of species from other

⁶⁰⁶ *ibid* 9.

⁶⁰⁷ *ibid* 15.

⁶⁰⁸ *ibid* 11.

⁶⁰⁹ *ibid*.

⁶¹⁰ *ibid* 19.

areas as well as human-induced impacts such as climate change. It is also well-acknowledged that ecosystems are interconnected and local changes in ecosystems may create shifts in large ecosystems. This document notes as follows:

Integrating a management approach to oceans involves considering impacts from a variety of activities at an ecosystem level. Ecosystems occupy geographic space, but their boundaries are open and may shift over time, contracting and expanding in reaction to such diverse influences as the invasion of organisms from other ecosystems, global climate change, currents that are ocean basin wide as well as local and, increasingly and pervasively, the effects of humans. Each ecosystem interacts and nests within other ecosystems. Local ecosystems, such as estuaries and bays, are sub-sets of larger ecosystems and as such they are interdependent. Irreversible shifts in these large-scale systems may in turn be triggered by local change.⁶¹¹

Integrated management is a very helpful tool whereby all sectors, including the new sectors such as OWE, can collaborate to reduce conflicts and promote the protection of the environment. It warrants an engagement of all levels of government, stakeholders, and all people, including Indigenous people. Federal departments which have mandates to protect the environment or set policies and standards should be engaged in the process of integrated management of oceans for the conservation of marine areas. Similarly, provincial departments that are in a better position with the impacts of development activities should collaborate with other levels of government for integrated management of natural resources. This inclusive collaboration enhances an integration suitable for the development of OWE.

⁶¹¹ Fisheries and Oceans Canada, 'Canada's Oceans Strategy: Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada' (n 65) 5.

Such integration needs coordination. At the governmental level, the Department of Fisheries and Oceans Canada (DFO) has a leading role in consultation, cooperation, and collaboration with all levels of government, Indigenous people, and stakeholders to design effective integrated management plans.⁶¹² DFO should play a leading role in the planning of marine activities, including OWE. This is particularly true because maintaining the structures and functions of ecosystems involves the assessment and monitoring of various matters: the diversity of ecosystem components, the condition of species, and variability of species, and the productivity of ecosystems. In addition, the areas of the ecosystem where they have specific characteristics in terms of being ecologically sensitive or containing specific species must be protected against the potential impacts of OWE.⁶¹³ Coordination between sectors is vital to protect the ecosystem resilience.

In addition, an integrated management plan creates a collaborative and cooperative process into which various considerations should be factored. The roles and responsibilities of authorities and stakeholders should be manifested in the management process. The form of collaboration and cooperation should be designed, whether it should be in the form of “multi-stakeholder advisory” bodies or “co-management bodies”.⁶¹⁴ The integrated management plan also complements the current sectoral plans by provoking holistic approaches and coherent actions for more enhanced and effective decision-making.

⁶¹² *ibid* 7.

⁶¹³ *ibid* 17. These areas include marine protected areas, whether those areas are identified under the Ocean Act or other areas such as National Marine Conservation Areas, and Marine Wildlife Sanctuaries. In the conservation of ecosystems, other areas such as commercial and non-commercial fishery resources such as marine mammals, endangered or threatened species, unique habitats, and areas of high biodiversity or biological productivity should be considered in accordance with the Oceans Act.

⁶¹⁴ *ibid* 27.

Planning and managing OWE projects require comprehensive plans for all marine uses and sectoral plans for each marine use, including new activities such as OWE. The Oceans Strategy: Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada recognized the importance of an overall plan and sectoral plans as it notes:

Integrated Management is not intended to replace existing sectoral processes but rather to provide overall coordination, coherence and balance to the manner in which an ocean or coastal area is managed. This can involve coordination of government policies, regulatory approaches and management actions, the building of vertical and horizontal linkages to achieve more collaborative and balanced decisions, as well as agreed mechanisms for problem solving in support of consensus-based planning and decision-making.⁶¹⁵

The plan also should have the required flexibility to be adapted according to the data that are gathered in the process of development. Data could be related to different aspects of the area including ecological, political, administrative, and matters related to marine activities. Data collection assessments help spatial and temporal understanding of marine uses, identifying gaps and weaknesses in knowledge, threats to ecosystems, estimated cumulative effects, facilitating the establishment of an appropriate regulatory framework, and development of “Marine Environmental Quality” standards.⁶¹⁶

The integrated management plan should also provide some conflict resolution methods to avoid conflicts that may arise from existing marine uses or new developments in marine areas such as OWE. To reduce conflicts, several tools might be used, which

⁶¹⁵ *ibid.*

⁶¹⁶ *ibid* 27, 28.

include the use of scientific, traditional, and social knowledge and factual information, application of management principles, identification of ecosystem-based objectives and thresholds, assessment of cumulative effects based on scientific models, and identifying and excluding marine protected areas from the scope of human activities. The collaborative and cooperative process paves the way for marine users to reflect and adjust activities to align the specified planning area with the Large Ocean Management Area and the Marine Environmental Quality standards. In the original plan, Canada's Oceans Action Plan identified five priority areas as Large Ocean Management Areas for integrated management planning. These priority areas included Placentia Bay and the Grand Banks, the Scotian Shelf, the Gulf of St. Lawrence, the Beaufort Sea, and the Pacific North Coast. These areas are named priority areas because they are characterized by different features such as important living and non-living marine resources, areas of high biological diversity and productivity, and increasing development and competition for ocean space and resources. There are also other scales such as coastal management areas.⁶¹⁷

3.2.1.1.2.2 The Eastern Scotian Shelf Integrated Management Initiative

The Eastern Scotian Shelf in the Atlantic Ocean is a specific marine area that was identified in Canada's Oceans Strategy in 2002 as a priority to achieve sustainable and integrated use of Canada's oceans. This measure was named the "Eastern Scotian Shelf Integrated Management (ESSIM) Initiative". The ESSIM Initiative was the first integrated

⁶¹⁷ *ibid* 28; Government of Canada, 'Canada's Oceans Action Plan: For Present and Future Generations' (2005) <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/315255e.pdf>> accessed 24 November 2024; Fisheries and Oceans Canada, 'Placentia Bay/Grand Banks Large Ocean Management Area: Integrated Management Plan (2012-2017)' (2012) 15 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/347923.pdf>> accessed 24 November 2024. See, for example, Placentia Bay/Grand Banks Large Ocean Management Area: Integrated Management Plan (2012-2017) that includes coastal management areas as well.

ocean management pilot that was released under the Oceans Act. Its goals were sustainable use and maintaining biological diversity through a collaborative process.⁶¹⁸ The ESSIM was to strike a practical and sustainable balance between human uses and the ecosystem and to create a policy to manage the ocean sectors involved.⁶¹⁹ The ESSIM set three goals to strike this balance: “collaborative governance and integrated management, sustainable human use, and healthy ecosystems”.⁶²⁰

ESSIM was intended to be inclusive of all sectors and actors. It identified human activities in this area, which included the operation of fisheries, shipping, laying cables, developing oil and gas fields, operating defense activities, scientific research, tourism, and ecosystem conservation.⁶²¹ The ESSIM specified a forum in which stakeholders (e.g. governmental bodies, communities, First Nations, and industry users) collaborate, manage, and plan for the Scotian Shelf.⁶²² This collaborative model is essential for a bottom-up approach to integrated management of human uses and preservation of ecosystems.

However, user-user conflicts and user-environment conflicts are unavoidable and need to be managed. A discussion paper, which was prepared to answer the questions regarding conflict avoidance or resolution, identified some potential conflicts including

⁶¹⁸ Elizabeth Foster, Marcus Haward and Scott Coffen-Smout, ‘Implementing Integrated Oceans Management: Australia’s South East Regional Marine Plan (SERMP) and Canada’s Eastern Scotian Shelf Integrated Management (ESSIM) Initiative’ (2005) 29 *Marine Policy* 398.

⁶¹⁹ Fisheries and Oceans Canada, ‘Eastern Scotian Shelf Integrated Ocean Management Plan: Strategic Plan’ (ESSIM Planning Office, Oceans and Coastal Management Division, Fisheries and Oceans Canada, Bedford Institute of Oceanography 2007) 8 <<http://www.dfo-mpo.gc.ca/Library/333115.pdf>> accessed 1 January 2021.

⁶²⁰ *ibid* 11.

⁶²¹ Canada’s Oceans Strategy (n 65) 29.

⁶²² *ibid*.

substantive, procedural, and structural conflicts.⁶²³ Substantive conflict includes conflicts over spatial allocation for multiple sectors like seabed activities (e.g. cables and pipelines) and extraction activities (e.g. fisheries and oil and gas).⁶²⁴ As one way to avoid conflicts, the discussion paper suggested that the established rights (the first to undertake the activity) and giving priority to local communities should be taken into account. This solution is helpful in terms of existing or current activities but does not consider any plan for future activities such as OWE. New activities require an overall plan that would include all sectors and provide cross-sectoral solutions.

3.2.1.1.2.3 A Regional Oceans Plan: the Scotian Shelf, the Atlantic Coast, and the Bay of Fundy

After the ESSIM Initiative was completed in 2012, DFO expanded the ESSIM's scope by adding the Atlantic coast and the Bay of Fundy. It used lessons learned from the ESSIM Initiative and provided a new and more developed plan in 2014, entitled "Regional Oceans Plan - Scotian Shelf, Atlantic Coast, Bay of Fundy".⁶²⁵

DFO under this regional plan supports undertaking the MSP process. Spatial planning helps to manage human uses and ecosystems based on data and maps.⁶²⁶ It emphasizes planning that is practical, operational, flexible, and adaptive enough to be able to respond to coastal and ocean problems.⁶²⁷ The same principles stipulated in the Oceans

⁶²³ BLSmith Groupwork Inc., 'Conflict, Collaboration and Consensus in the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. Oceans and Coastal Management Report' (2005) 17 <<https://waves-vagues.dfo-mpo.gc.ca/Library/314541.pdf>> accessed 4 May 2021.

⁶²⁴ *ibid.*

⁶²⁵ Department of Fisheries and Oceans Canada, 'Regional Oceans Plan - Scotian Shelf, Atlantic Coast, Bay of Fundy' (2014) 9 <http://publications.gc.ca/collections/collection_2016/mpo-dfo/Fs104-32-1-2014-eng.pdf> accessed 31 December 2020.

⁶²⁶ *ibid.* 7.

⁶²⁷ *ibid.*

Act are followed in this plan: sustainable development, precautionary approach, adaptive management, ecosystem approach, collaborative approach, and integrated management.⁶²⁸ Despite the ESSIM Initiative of 2002, which did not contain details of MSP,⁶²⁹ the plan emphasizes this new process.

Under this regional plan, new approaches should be adopted in MSP. For example, DFO should take “pragmatic and operational approaches” and cumulative impact assessments into MSP so that problems and solutions for conflicts can be found.⁶³⁰ The regional plan also identifies some outcomes of the implementation of MSP: identification of conflicts, assessments of human activities for decision-makers, cumulative impact assessments of uses, and the provision of information to users.⁶³¹ The new approach taken in this regional plan to use MSP is consistent with the approach adopted in other countries for the management of ocean uses and ecosystems.

MSP can guide how to reduce the number of existing and future conflicts between OWE and other marine uses and ecosystems. With respect to renewable energy technologies, the current plan only states that there is one renewable tidal energy station in the Bay of Fundy but sets out the goal of building seven locations for tidal in-stream turbines on the Nova Scotia side of the Bay, eight sites on the New Brunswick side and the potential for wind and wave energy in other parts of the region.⁶³² 16 potential tidal energy

⁶²⁸ *ibid* 10.

⁶²⁹ Tim Hall and others, ‘Advancing Objectives-Based, Integrated Ocean Management through Marine Spatial Planning: Current and Future Directions on the Scotian Shelf off Nova Scotia, Canada’ (2011) 15 *Journal of Coastal Conservation* 251.

⁶³⁰ Department of Fisheries and Oceans Canada (n 625) 24.

⁶³¹ *ibid*.

⁶³² *ibid* 18–19.

sites in the Bay of Fundy may conflict with other marine uses and conservation priorities.⁶³³ One of the main purposes of MSP is to identify and find solutions for the conflicts between renewable energy technologies and the components of ecosystems. For instance, tidal energy may conflict with ecological areas such as the North Atlantic Right Whale Critical Habitat and the Musquash Estuary Marine Protected Area.

Overall, Regional Oceans Plan - Scotian Shelf, Atlantic Coast, Bay of Fundy does not provide any details on how it has been operationalized. At an operational level, DFO stated in a progress report that various actions were taken between 2014 and 2016. In particular, DFO's report states that a risk-based approach is used to identify high-priority areas such as ecologically and biologically significant areas.⁶³⁴ More work is needed in the region to coordinate the development of OWE with other marine uses and the environment.

3.2.1.1.2.4 Fisheries and Oceans Canada's Initiatives on Marine Spatial Planning

Fisheries and Oceans Canada's National Guidance on Marine Spatial Planning sets a foundation for identifying goals, principles, and approaches to guide the formation of MSP.⁶³⁵ This guidance considers MSP a "collaborative process" to achieve integrated ocean management mandated under the Oceans Act.⁶³⁶ The guidance is not an MSP or a framework for MSP, but it provides high-level goals and principles and reflects visions of

⁶³³ *ibid* 24.

⁶³⁴ 'Regional Oceans Plan - Scotian Shelf, Atlantic Coast, Bay of Fundy Progress Report 2014-2016' <<https://www.dfo-mpo.gc.ca/oceans/publications/oceans-plan/progress-etape/index-eng.html>> accessed 4 May 2021.

⁶³⁵ Fisheries and Oceans Canada, 'Fisheries and Oceans Canada's National Guidance on Marine Spatial Planning' (2024) <https://publications.gc.ca/collections/collection_2024/mpo-dfo/Fs23-734-2024-eng.pdf> accessed 11 October 2024.

⁶³⁶ *ibid*.

Canada's Oceans Strategy to take steps towards MSP.⁶³⁷ The high-level goals include enabling integrated management of oceans through collaboration and coordination between ocean users, combining data and information, and advancing social, cultural, economic, and environmental objectives.⁶³⁸ The high-level goals also include respecting regional diversity, which reflects diverse social, cultural, economic, and environmental contexts.⁶³⁹ The guidance also provides some principles including sustainable development, all-inclusive participation, scientific and Indigenous Peoples' evidence-based knowledge, ecosystem-based approach, and transparent processes.⁶⁴⁰ The guidance also offers non-linear phases that support the establishment and development of MSP.⁶⁴¹ Phases comprise (i) The identification of existing initiatives, strategies, and stakeholders; (ii) The integration of diversified sources of information; (iii) Building partnerships between involved parties by identifying roles and collaborating on priorities; (iv) Developing a marine spatial plan; and (v) Collaborative implementation of the plan.⁶⁴²

The recently published First-generation Marine Spatial Plan: Scotian Shelf and the Bay of Fundy focuses on the sustainable management of marine activities, including OWE.⁶⁴³ Its key principles include ecosystem-based management, engagement with stakeholders and Indigenous communities, area-based management, adaptive management, and sustainability.⁶⁴⁴ This Plan recognizes OWE development as a key component of the

⁶³⁷ *ibid.*

⁶³⁸ *ibid.*

⁶³⁹ *ibid.*

⁶⁴⁰ *ibid.*

⁶⁴¹ *ibid.*

⁶⁴² *ibid.*

⁶⁴³ 'Maritimes Region First-Generation Marine Spatial Plan: Scotian Shelf and Bay of Fundy' <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41270526.pdf>> accessed 7 January 2025.

⁶⁴⁴ *ibid.*

transition to cleaner energy sources, aiming to integrate OWE into the MSP process while taking into account other marine components such as fisheries, shipping, and ecological features.⁶⁴⁵ The Plan provides a high-level overview of management plans, incorporating information and input from stakeholders.

3.2.1.1.2.5 Blue Economy: Targeted Regulatory Review – Regulatory Roadmap

DFO leads the Blue Economy Strategy, which aims to create jobs for coastal communities while ensuring oceans remain healthy.⁶⁴⁶ The Blue Economy Roadmap is a general policy framework that forms the vision, goals, and objectives for the sustainable development of marine activities, emphasizing the need to balance economic growth with environmental preservation. It generally focuses on key areas like sustainable fisheries, marine renewable energy, maritime transport, and biodiversity protection.

The Blue Economy Regulatory Roadmap⁶⁴⁷ is a more specific initiative that provides a detailed plan for implementing the Blue Economy Strategy. It outlines the regulations, policies, and governance needed to operationalize the Strategy's goals. The roadmap includes timelines, milestones, and steps for creating regulations, monitoring frameworks, and coordination mechanisms to ensure sustainable marine resource use.

The Blue Economy Regulatory Roadmap is relevant to OWE in various ways. First, it emphasizes the importance of impact assessment of marine renewable energy projects

⁶⁴⁵ *ibid.*

⁶⁴⁶ Fisheries and Oceans Canada, 'Canada's Blue Economy' <<https://www.dfo-mpo.gc.ca/campaign-campagne/bes-seb/index-eng.html>> accessed 14 December 2024. DFO has yet to release a promised complete Blue Economy Strategy.

⁶⁴⁷ Fisheries and Oceans Canada, 'Blue Economy Regulatory Roadmap' (2024) report <<https://www.dfo-mpo.gc.ca/about-notre-sujet/blue-economy-economie-bleue/roadmap-feuille-route-eng.html>> accessed 25 November 2024.

before development and exhausting the relevant provisions in the Fisheries Act and the Species at Risk Act.⁶⁴⁸ Second, it highlights a clear regulatory framework for marine renewable energy, including OWE, through various initiatives such as the 2024 Act and Canada Offshore Renewable Energy Regulations, which were already discussed and analyzed in this thesis.⁶⁴⁹ Third, it will advance MSP policy in Canada in two phases: (i) Phase 1- It promises to develop a “policy statement on MSP” to clarify certain matters such as the involved authorities and their roles and responsibilities, the definition of MSP, and the alignment of MSP with priorities. This phase is expected to be completed by 2026-2027; (ii) Phase 2- DFO in collaboration with other governmental bodies will establish “a comprehensive whole-of-government policy statement/guidance” to lead and facilitate integrated ocean management. This phase is expected to be completed by 2030-2031.⁶⁵⁰

3.2.1.1.2.6 The Marine Environmental Quality Program

The Marine Environmental Quality Program (MEQ)⁶⁵¹ aims at sustainable management of human-induced impacts by maintaining and improving the marine environment. The program, which is authorized under the Oceans Act, can use several regulatory and non-regulatory tools including setting objectives, criteria, guidelines, and standards to assess the environmental risks from human activities. Under the MEQ, the stressors that create the most pressure on the marine environment must be identified and

⁶⁴⁸ *ibid.*

⁶⁴⁹ *ibid.*

⁶⁵⁰ *ibid.*

⁶⁵¹ The program states it ‘has authority under the *Oceans Act* to use a variety of non-regulatory and regulatory tools such as objectives, criteria, guidelines, and standards and requirements to assess and manage human activities and their potential risks to species and the ecosystems that sustain them’.

It should be noted that section 32(d) of the Oceans Act authorizes MEQ guidelines and section 52.1 allows regulations to be passed to give legal effect to MEQ requirements and standards.

the management measures must be evaluated to find out whether they are effective. If such measures are ineffective, it is necessary to see what should be done to address challenges and modify or develop the current measures.⁶⁵²

MEQ could be used to enhance the protection of the environment against OWE impacts.⁶⁵³ The MEQ could provide a set of guidelines and standards that manage and control the impacts of OWE. For instance, noise is one of the impacts of OWE that should be regulated. Setting criteria helps understand what level of noise, whether individually or in combination with other sources, is acceptable and how noise can be reduced or minimized through preventive measures.

3.2.1.1.3 Critiques of the Oceans Act and Its Policies

Overlapping and inconsistent statutory mandates regarding various sectors or environmental issues related to the management of OWE constrain effective integrated management. For example, establishing marine protected areas is shared between the mandates of various departments such as DFO, the Department of Environment, and Parks Canada.⁶⁵⁴ The Canadian Coast Guard, which is part of the DFO, is functionally and culturally responsible for the safety of mariners while the protection of the environment is close to the mandate of the Department of Transport.⁶⁵⁵ The Canada-Nova Scotia Offshore Petroleum Board also has a mandate for issuing energy development and exploitation

⁶⁵² Government of Canada, 'Managing Marine Environmental Quality - Together towards Healthy Oceans' <<https://www.dfo-mpo.gc.ca/oceans/noise-bruit/meq-qmm-eng.html>> accessed 16 November 2023.

⁶⁵³ The potential stresses of OWE on marine fish and other components of the marine environment were identified in chapter two of this thesis.

⁶⁵⁴ Aldo Chircop and Larry Hildebrand, 'Beyond the Buzzwords: A Perspective on Integrated Coastal and Ocean Management in Canada' in Donald R Rothwell and David VanderZwaag (eds), *Towards Principled Oceans Governance* (Routledge 2006) 29.

⁶⁵⁵ *ibid.*

licenses that might create an overlap with other licensed areas.⁶⁵⁶ Effective integrated management requires intergovernmental agreements that reduce uncertainties and overlaps.

Reaching such intergovernmental agreements for integrated management is challenging in light of the diversity of institutions and the complexity of communication and interaction with them.⁶⁵⁷ For example, the Minister of Fisheries and Oceans must cooperate with ‘other ministers, boards, and agencies of the Government of Canada, with provincial and territorial governments and with affected aboriginal organizations, coastal communities and other persons and bodies, including those bodies established under land claims agreements’.⁶⁵⁸ In addition, this level of diversity is necessary but difficult due to a lack of interest, relevance, or resources.⁶⁵⁹ Therefore, engagement of all sectors and coordination of communication among them is not straightforward.

Such coordination might also be undermined due to historical institutional biases in favour of a specific marine user. DFO has received criticism because it has institutionally inherited fisheries’ powers and is lobbied by fishermen for higher fisheries’ considerations.⁶⁶⁰ In integrated management, this view should be adjusted considering that the powers and duties of DFO under the Oceans Act are not limited to fisheries. Integrated management should ensure the inclusion of all stakeholders’ interests and needs with a balanced approach that reduces the conflict of interests of all involved parties.⁶⁶¹

⁶⁵⁶ *ibid.*

⁶⁵⁷ *ibid* 32.

⁶⁵⁸ Oceans Act (n 246) s 33(1).

⁶⁵⁹ Chircop and Hildebrand (n 654) 33.

⁶⁶⁰ *ibid* 32.

⁶⁶¹ *ibid.*

The Oceans Act and its provisions and policies related to ocean management lack details and clarity to provide actionable procedures for integration. The Act does not offer an adequate governance mechanism to be complied with by all involved governmental and non-governmental parties.⁶⁶² In addition, the Oceans Act only refers to integrated management plans and it still lacks a clear call for MSP with clear management procedures, timelines, and responsibilities.⁶⁶³ It does not contain any detail on how the concept of sustainable development and integrated management plans will be implemented and how fragmentation in government approvals might be reduced.⁶⁶⁴ It does not direct how marine protected areas are prioritized.⁶⁶⁵ Lack of funding and accountability mechanisms are also critical.⁶⁶⁶ These weaknesses and challenges have been factors leading to a lack of proper implementation of integrated management over the last decade.⁶⁶⁷

The lack of MSP, which is emphasized as an appropriate tool,⁶⁶⁸ is a hurdle for OWE planning. Ambiguities in MSP will cause uncertainties about whether a planned OWE will be consistent with the ecological objectives of the concerned marine area. The absence of plans can be also challenging in light of the Oceans Act as it gives the Minister a subjective discretion in establishing each marine protected area on a case-by-case basis,

⁶⁶² Sabine Jessen, 'A Review of Canada's Implementation of the Oceans Act since 1997—From Leader to Follower?' (2011) 39 *Coastal Management* 20.

⁶⁶³ Hutchings and others (n 603) 275, 277, 280.

⁶⁶⁴ Aldo Chircop and others, 'Legislating for Integrated Marine Management: Canada's Proposed Oceans Act of 1996' (1996) 33 *Canadian Yearbook of international Law/Annuaire canadien de droit international* 305, 315.

⁶⁶⁵ *ibid.*

⁶⁶⁶ Jessen (n 662).

⁶⁶⁷ Peter J Ricketts and Lawrence Hildebrand, 'Coastal and Ocean Management in Canada: Progress or Paralysis?' (2011) 39 *Coastal Management* 4.

⁶⁶⁸ 'Oceans 20: Canada's Oceans Act Workshop Report' (2017) <https://www.wcel.org/sites/default/files/publications/oceans20_workshop_report_final.pdf> accessed 26 September 2024.

although this ad hoc establishment creates a unique regulatory framework based on ecological conservation objectives.⁶⁶⁹ This procedure does not guide what potential or future marine protected areas are and whether OWE will be consistent with them.

3.2.1.2 Fisheries Act

Fish and fish habitats would be affected by OWE and are the subject of protection under the Fisheries Act.⁶⁷⁰ This Act generally applies to cases when there are potential impacts from the implementation of projects on fish or fish habitat because one of the purposes of this Act is to protect and conserve fish and fish habitat and control and manage fisheries properly.⁶⁷¹ This Act may specifically apply to the development of OWE from two aspects: the impact on fish and the impact on fish habitat.

Fish and fish habitats are broadly defined under the Fisheries Act. The definition applies to fish and its different types such as ‘shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals’. The definition covers ‘the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals’.⁶⁷² Fish habitat also has a wide definition, and it includes the water frequented by fish and any areas on which fish and their life processes depend.⁶⁷³ Such wide definitions show the level of application of this Act when it comes to fish, the different stages of their life, and their habitats.

⁶⁶⁹ Hubert and Gray (n 602) 154; Watson and Hewson (n 601) 118.

⁶⁷⁰ As discussed in chapter two of this thesis, it is likely that the development of OWE affects fish and fish habitat, particularly during the construction period, and this development changes habitats and the composition of fish in the OWE area.

⁶⁷¹ Fisheries Act, RSC 1985, c F-14, s 2(1).

⁶⁷² *ibid* ss 2(1).

⁶⁷³ *ibid*.

No matter where fish habitat is, when fish and fish habitat are impacted due to human-induced activities, the Fisheries Act applies. From the Fisheries Act perspective, jurisdictional boundaries do not impose any limitations on its application. This Act applies to Canadian waters and any part of the continental shelf of Canada that extends beyond the Canadian fisheries waters.⁶⁷⁴ According to this Act, Canadian fisheries waters means ‘all waters in the fishing zones of Canada, all waters in the territorial sea of Canada and all internal waters of Canada’.⁶⁷⁵ This wide jurisdiction for application provides a good foundation that the impacts on fish and fish habitats are tested without any boundaries at the national level.

With respect to the impacts on fish, the activities in the construction period such as cutting, waste of materials, dredging, excavation, and pile driving cause an increase in sediment suspension, deposition of sediments, release of sediment contaminants, and noise, which affects fishes.⁶⁷⁶ Subsection 34(1) on the definition of deleterious substance is relevant in this context:

34 (1) The following definitions apply in this section and sections 34.1 to 42.5.

deleterious substance means

(a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or

⁶⁷⁴ *ibid* s 2.2(1).

⁶⁷⁵ *ibid* s 2(1).

⁶⁷⁶ Horwath and others (n 308) 27.

(b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, and without limiting the generality of the foregoing includes

(c) any substance or class of substances prescribed pursuant to paragraph (2)(a),

(d) any water that contains any substance or class of substances in a quantity or concentration that is equal to or in excess of a quantity or concentration prescribed in respect of that substance or class of substances pursuant to paragraph (2)(b), and

(e) any water that has been subjected to a treatment, process or change prescribed pursuant to paragraph (2)(c); (substance nocive)

deposit means any discharging, spraying, releasing, spilling, leaking, seeping, pouring, emitting, emptying, throwing, dumping or placing; (immersion ou rejet)⁶⁷⁷

Although the definition of deleterious substance in subsection 34(1) applies to activities that cause the release of waste materials and cuttings into water, it may be partly problematic. The focus of the definition by the wording “if added to any water” is on the addition of deleterious substance or addition of water which contains deleterious substance. This connotation may limit the application of this subsection to part of activities that cause suspension of seabed sediment contaminants and affect fish. One may argue that if the purpose of the Act, which is the protection of fish, is considered, the causal link between

⁶⁷⁷ Fisheries Act (n 671) s 34(1).

the construction/installation of OWE and suspension of seabed contaminants or sediments and their impacts on fish is sufficient for the application of this subsection.

If the definition applies in any case, the deposit of deleterious substances into water frequented by fish is prohibited under subsection 36(3). This subsection provides:

(3) Subject to subsection (4), no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

It is accepted in the courts that for being deleterious, it is not necessary that the substance to be toxic, but it is sufficient that the substance be harmful to fish. For example, *R. v. Byron Creek Collieries Ltd.* BC Provincial Court (1977) held that sediment is deleterious to fish because it clogs fish's gills or hinders them from feeding by reducing their visibility of prey.⁶⁷⁸ Based on decisions in *R. v. Chew Excavating Ltd. and District of Saanich BC Provincial Court* (1978), it is not necessary to show the actual harm to fish (e.g., that fish are killed due to deleterious substance).⁶⁷⁹ In addition, according to the decision in *R. Jack Cewe Ltd. BC Provincial Court* (1981), showing that the river was made deleterious by the sediment is not required and it is only sufficient to demonstrate that the substance itself is deleterious.⁶⁸⁰ It should also be noted that in *R. v. MacMillan Bloedel (Alberni) Limited* (1978), the court found that the word "frequented" by fish does not mean

⁶⁷⁸ Fisheries and Oceans Canada, 'Habitat Enforcement Bulletin' (2001) 11 2 <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/222527_11.pdf> accessed 4 December 2023.

⁶⁷⁹ *ibid* 3.

⁶⁸⁰ *ibid*.

frequent or continual occupation or habitual association by fish, but it is sufficient that water is used regularly even such use is occurred annually for a short period of time.⁶⁸¹

Subsection 34.4(1) further prohibits any work, undertaking, or activity that results in the death of fish.⁶⁸² Nonetheless, under the exceptions stated in subsection 34.4(2), a work, undertaking, or activity might be, *inter alia*, a prescribed work, undertaking, or activity, or might be authorized under regulations or by the Minister.⁶⁸³ In accordance with the current policy, it is expected that in the Minister's determination on granting authorization, DFO evaluates the likely impacts of OWE on fish based on a risk-based approach, which considers the relative contribution of potentially affected fish to the productivity of the relevant fisheries.⁶⁸⁴ In this determination, various factors including the types of affected fish, the stage of life when the fish is affected, and the life-cycle functions are considered.⁶⁸⁵

OWE might also disturb marine mammals and be regulated by the Marine Mammal Regulations under the Fisheries Act. According to this regulation, disturbing a marine mammal is prohibited unless when the person, who carries out a work, undertaking, or activity, has obtained an authorisation under the Fisheries Act.⁶⁸⁶ The regulation also provides for a situation where there is an accident between a marine mammal and a vehicle

⁶⁸¹ *R. v. MacMillan Bloedel (Alberni) Limited* (1978), 7 B.C.L.R. 210 (Co. Ct.), aff'd in part (1987), 12 B.C.L.R. 29 (C.A.) cited in 'A Practical Guide to the Fisheries Act and to the Coastal Fisheries Protection Act' 15 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/282791.pdf>> accessed 4 December 2023.

⁶⁸² Fisheries Act (n 671) s 34.4(1).

⁶⁸³ *ibid* s 34.4(2).

⁶⁸⁴ Fisheries and Oceans Canada, 'Fish and Fish Habitat Protection Policy Statement' (2019) 14 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40971193.pdf>> accessed 6 February 2024.

⁶⁸⁵ *ibid*.

⁶⁸⁶ Marine Mammal Regulations, SOR/93-56 s 7(1)(a).

or fishing gear. In this case, the operator must notify the minister of the details of the incident.⁶⁸⁷ This provision does not include other activities such as OWE, making its application uncertain to oblige OWE operators if a harmful incidence occurs.

With respect to the second type of impact of OWE, which is the impact on fish habitats, Section 35 applies. Under subsection 35(1), performing ‘any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat’ is prohibited unless it falls under an exception in subsection 35(2).⁶⁸⁸ For example, when the work, undertaking, or activity is a prescribed one, or authorized under regulations or by the Minister, it is considered an exception. Hence, Section 35 provides for a general prohibition for the protection of fish habitats and the exceptions that permit activities under certain conditions.

The activities of the proponent of an OWE project may have the following results:

- i) The death of fish;
- ii) The harmful alteration, disruption, or destruction of fish habitats;
- iii) The deposit of a deleterious substance in water frequented by fish or in any place under any conditions.

In these cases, under subsection 37(1), the proponent is obliged to provide the information requested by the Minister or pursuant to regulations. Information includes ‘any documents — plans, specifications, studies, procedures, schedules, analyses, samples, evaluations — and any other information relating to the work, undertaking or activity, or to the water, place, fish or fish habitat that is or is likely to be affected by the work, undertaking or activity’.⁶⁸⁹ The provision of documents enables the Minister to determine

⁶⁸⁷ *ibid* s 39.

⁶⁸⁸ Fisheries Act (n 671) s 35(1). The “harmful alteration, disruption or destruction” in this subsection is interpreted as ‘any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes of fish’, See Fisheries and Oceans Canada, ‘Fish and Fish Habitat Protection Policy Statement’ 15

⁶⁸⁹ *ibid* s 37(1).

the likely impacts of the OWE activities and the deposit of a deleterious substance on fish and fish habitats, and the measures that prevent or mitigate the effects.⁶⁹⁰

DFO assesses the impact of projects on fish based on multiple factors that can be applied to OWE projects. One factor is to examine the scale and type of impacts on the productivity of fish (“potential sustained yield of all fish populations and their habitats”) to find out whether the activity affects the connection of fish and fish habitats with the components of productivity, the lifecycle of the fish, or ecosystem transformation and fish population. Such examination informs the types of measures (avoidance, mitigation, and/or offsetting) that should be taken and whether it is consistent with the management objectives.⁶⁹¹ A hierarchical order of measures is adopted to (i) Avoid the impact by choosing the appropriate location and time for activity; (ii) Mitigate the spatial scale, duration, or intensity of harmful impacts, which can be done by implementation of best management practices; and (iii) As a last resort and for residual impacts, offset (counterbalance) loss or harm to fish and fish habitats with positive effects on ecosystems in light of fisheries management objectives and local restoration priorities.⁶⁹² Other factors such as cumulative effects, conservation priorities, and Indigenous knowledge are important in decision-making about projects. All these factors are related to certain circumstances identified under subsection 34.1(1) of the Fisheries Act, where the minister wants to make recommendations to the Governor in Council.

A good approach to protect ecological integrity is the extension of the application of these factors to situations where a project like an OWE project is proposed to get

⁶⁹⁰ *ibid* s 37(1)(a) & (b).

⁶⁹¹ Fisheries and Oceans Canada, ‘Fish and Fish Habitat Protection Policy Statement’ (n 684) 19.

⁶⁹² *ibid* 20, 21, 22.

authorization. This interpretation can be implicitly understood from the Fish and Fish Habitat Protection Policy Statement, which does not make any limitations on the application of these factors.⁶⁹³

3.2.1.3 Species at Risk Act

The Species at Risk Act, which supports ecological sustainability by appreciating the intrinsic value of wildlife for ecological reasons, has adopted definitions and lists for species at risk.⁶⁹⁴ The definition includes extirpated, endangered, or threatened species or species of special concern.⁶⁹⁵ Schedule 1 of the Act provides a list of species at risk. For example, tri-colored bats, blue whales, North Atlantic right whales, leatherback sea turtles, Atlantic salmon, white sharks, and Atlantic whitefish are listed as endangered species. The pallid bat is listed as a threatened species. Sea otters, harbor porpoises, fin whales, and banded killifish are of special concern.⁶⁹⁶ The definitions and identification of species at risk help us understand the types of species that are protected under this Act and might be affected by human activities.

⁶⁹³ *ibid* 18.

⁶⁹⁴ Species at Risk Act, SC 2002, c 29 s 2(1). The appreciation is highlighted in the preamble of this Act, which states

Recognizing that Canada's natural heritage is an integral part of our national identity and history, wildlife, in all its forms, has value in and of itself and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons, Canadian wildlife species and ecosystems are also part of the world's heritage and the Government of Canada has ratified the United Nations Convention on the Conservation of Biological Diversity.

⁶⁹⁵ *ibid*.

⁶⁹⁶ *ibid* sch 1.

The Species at Risk Act provides for various regulatory measures for the protection of listed endangered species and their habitats.⁶⁹⁷ These measures will be reviewed and analyzed in the following sections.

A) The Protection of Listed Species

Subsection 32(1) describes prohibited activities. It prohibits activities such as killing, harming, harassing, capturing, or taking an individual of a wildlife species that is listed in one of the categories of extirpated, endangered, or threatened species. This subsection states, ‘No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species’.⁶⁹⁸

The prohibition in this subsection is broad in two ways: first, harm is a broad word, and it can include any activities including noise from the construction and operation of OWE. Second, harm to an individual is sufficient to fall within the prohibition set forth in this subsection.

B) The Protection of Critical Habitats and Residences⁶⁹⁹

Under the Species at Risk Act, recovery strategies and action plans for species listed under this Act must identify the species’ critical habitat, to the extent possible, based on

⁶⁹⁷ David L. VanderZwaag and Maria Cecilia Engler-Palma, ‘Canada’s Species at Risk Act and Atlantic Salmon: Cascade of Promises, Trickle of Protection, Sea of Challenges’ (2011) 22 JELP 267, 4. According to this article, other measures, which are protective actions, include the assessment of the status of the species based on the best available scientific information; a formal and ongoing recovery planning process; substantial enforcement measures; and encouragement of financial support for recovery activities.

⁶⁹⁸ Species at Risk Act (n 694) s 32(1).

⁶⁹⁹ According to section 2(1) of the Species At Risk Act, *critical habitat* means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species, and *residence* means a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating.

the available information.⁷⁰⁰ Upon identification of critical habitat in the action plan, the examples of activities that are likely to result in its destruction must be included.⁷⁰¹ The description of critical habitat is identified in the recovery strategy or action plan that is included in the public registry and must be published in the Canada Gazette.⁷⁰² This process applies to the critical habitat that is in a national park of Canada named and described in Schedule 1 to the Canada National Parks Act, the Rouge National Urban Park established by the Rouge National Urban Park Act, a marine protected area under the Oceans Act, a migratory bird sanctuary under the Migratory Birds Convention Act, 1994 or a national wildlife area under the Canada Wildlife Act.⁷⁰³ For the areas that are not mentioned in these Acts, identification of critical habitat can be achieved by ministerial order under subsections 58(4) and (5), under any Act of Parliament, or an agreement according to Section 11 of the Species at Risk Act.⁷⁰⁴

The Species at Risk Act also states that the proponent is not permitted to carry out activities (e.g. construction of OWE) if such activity destroys any part of the critical habitat of any listed endangered or threatened species.⁷⁰⁵ Nonetheless, it is unclear what constitutes

⁷⁰⁰ Species at Risk Act (n 694) s 49(1)(a) & (c).

⁷⁰¹ *ibid* s 49(1)(a).

⁷⁰² *ibid* s 58(2).

⁷⁰³ *ibid*.

⁷⁰⁴ *ibid* ss 58(4) & (5) and 11.

⁷⁰⁵ *ibid* s 58(1). Section 58(1) provides:

58 (1) Subject to this section, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species — or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada — if

(a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada;

(b) the listed species is an aquatic species; or

(c) the listed species is a species of migratory birds protected by the Migratory Birds Convention Act, 1994.

the destruction of critical habitats.⁷⁰⁶ It can be defined as ‘destruction occurs when there is a temporary or permanent loss of a function of critical habitat’.⁷⁰⁷ The examples of the activities likely to destroy critical habitat in the recovery strategy should include activities that may occur within or outside of the boundaries of critical habitat and may cause “destruction of critical habitat features or attributes”.⁷⁰⁸ Such destruction may result in “loss of the habitat’s function and the species’ ability to perform its life-cycle processes”.⁷⁰⁹ Hence, if any OWE activity is likely to result in one of such consequences, it should be considered an activity with the effect of destruction of critical habitat.

A prohibition is applied if the construction of OWE destroys any part of the critical habitat of endangered or threatened species that is in provincial lands, as subsection 61(1) states that ‘No person shall destroy any part of the critical habitat of a listed endangered species or a listed threatened species that is in a province or territory and that is not part of federal lands.’⁷¹⁰

In addition, if the construction of OWE is in a place where it causes damage or destroys the residences of one or more individuals of a listed wildlife species, such construction is prohibited. Under Section 33 of this Act,

No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened

⁷⁰⁶ Olga Koubrak, David L VanderZwaag and Boris Worm, ‘Saving the North Atlantic Right Whale in a Changing Ocean: Gauging Scientific and Law and Policy Responses’ (2021) 200 *Ocean & Coastal Management* 105109.

⁷⁰⁷ Fisheries and Oceans Canada, ‘Directive on the Identification of Critical Habitat for Aquatic Species at Risk’ (2015) 7 <https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/policies/Directive-CriticalHabitatIdentification-v00-2016Sep12-Eng.pdf> accessed 18 November 2024.

⁷⁰⁸ *ibid* 8.

⁷⁰⁹ *ibid*.

⁷¹⁰ *Species at Risk Act* (n 694) s 61(1).

species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.⁷¹¹

C) Recovery Strategy and Action Plans

A recovery strategy must be proposed by the competent minister⁷¹² in the public registry within one year after the endangered species is listed or two years after the threatened species or extirpated species is listed.⁷¹³ After 60 days for public comments and 30 days for the competent minister to include comments, the final recovery strategy will be included in the public registry.⁷¹⁴ Based on the recovery strategy, one or more action plans must also be developed by the competent minister(s) with a statement about when such action plans will be completed.⁷¹⁵ After the recovery strategy or action plan identifies the critical habitat, the competent minister must make an order if the critical habitat is not legally protected under any law (e.g. the Oceans Act).⁷¹⁶ If the competent minister does not make this order, he/she must publish a statement in the registry on how the critical habitat is legally protected.⁷¹⁷

⁷¹¹ *ibid* s 33.

⁷¹² In accordance with section 2(1), ‘competent minister means

(a) the Minister responsible for the Parks Canada Agency with respect to individuals in or on federal lands administered by that Agency;

(b) the Minister of Fisheries and Oceans with respect to aquatic species, other than individuals mentioned in paragraph (a); and

(c) the Minister of the Environment with respect to all other individuals.’

⁷¹³ Species at Risk Act (n 694) s 42(1).

⁷¹⁴ *ibid* s 43(1) & (2).

⁷¹⁵ *ibid* ss 47 and 41(1)(g).

⁷¹⁶ *ibid* s 58(5)(a).

⁷¹⁷ *ibid* s 58(5)(b).

The activities of OWE should not undermine the preventive essence of the measures under the recovery strategy and action plans, which aim at recovering the extirpated, endangered, or threatened species.

D) Proponents' Obligation to Obtain Permit

Proponents have an obligation to obtain permits with respect to the likely harmful activities to listed wildlife species. For example, if the development of OWE (in any phase of construction, operation, and decommissioning) affects “a listed wildlife species” or “any part of its critical habitat or the residences of its individuals”, the proponent must obtain a permit from the competent minister in accordance with subsection 73(1).⁷¹⁸

E) Minister's Limitations on Granting Permit and Minister's Responsibilities Subsequent to Permit

Section 73 of the Species at Risk Act sets out the conditions for issuing a permit for an activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals. The competent minister does not have absolute discretion in granting permits. The competent minister may issue a permit only if specific preconditions are met, namely:

- (2) The agreement may be entered into, or the permit issued, only if the competent minister is of the opinion that
 - (a) the activity is scientific research relating to the conservation of the species and conducted by qualified persons;
 - (b) the activity benefits the species or is required to enhance its chance of survival in the wild; or

⁷¹⁸ *ibid* s 73(1).

(c) affecting the species is incidental to the carrying out of the activity.⁷¹⁹

The following conclusions can be drawn from this provision. First, some pre-conditions must be met in the opinion of the competent minister before a permit is issued. The competent minister must believe that all reasonable alternatives to the activity are considered, feasible measures to minimize the impacts of the activity are taken, and the activity will not jeopardize the survival or recovery of the species.⁷²⁰ Second, the words “incidental to” indicate that the effect must be secondary and cannot be central to the activity. For instance, if the development of OWE necessarily leads to any harm to the species, subsection 73(2)(c) does not confer the discretion to the competent minister to issue a permit. The effect must occur unintentionally, accidentally, and occasionally. For example, if the OWE development activities normally harm a listed species, the competent minister is not allowed to issue the permit. It should be noted that the scale of a project or its impacts is not a consideration, but the determining factor is whether the activity is likely to jeopardize survival or recovery.⁷²¹

Furthermore, some preconditions must be met before issuing a permit under subsection 73(3).⁷²² The competent minister must believe that first, ‘all reasonable

⁷¹⁹ *ibid* s 73(2).

⁷²⁰ *ibid* s 27(2).

⁷²¹ Fisheries and Oceans Canada Government of Canada, ‘Species at Risk Permitting Policy [Proposed]’ (Environment and Climate Change Canada 2016) Species at Risk: Policies and Guidelines Series 6 <https://registrelep-sararegistry.gc.ca/virtual_sara/files/policies/Permitting_EN.pdf> accessed 19 November 2024.

⁷²² Almost a similar provision exists under subsection 77(1) for cases where a permit is going to be granted by a minister, other than a competent minister. This subsection states: Despite any other Act of Parliament, any person or body, other than a competent minister, authorized under any Act of Parliament, other than this Act, to issue or approve a licence, a permit or any other authorization that authorizes an activity that may result in the destruction of any part of the critical habitat of a listed wildlife species may enter into, issue, approve or make the authorization only if the person or body has consulted with the competent minister, has considered the impact on the species’ critical habitat and is of the opinion that (a) all reasonable alternatives to the activity that would reduce the impact on the species’ critical habitat have been considered and the best

alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted'.⁷²³ Although the costs and significance of the activity are important, the solution that is best among different choices is when it advances the conservation of the species.⁷²⁴ Second, 'all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals'.⁷²⁵ The minister's determination of the feasibility is case-specific, which considers all biological, ecological, technical, and economic factors and whether the applicant has adopted the best practices.⁷²⁶ Third, 'the activity will not jeopardize the survival or recovery of the species'.⁷²⁷ The survival or recovery of a species at risk is jeopardized when the activity may prevent achieving objectives set for the population and distribution of species described in the recovery strategy of the species.⁷²⁸ If such a recovery strategy is not available or does not exist, other factors such as survival threshold, recovery based on the best achievable scenario, best available data, biological requirements of species, the nature and extent of the threat of the activity on species and its habitat or residences, and the applicant's proposal for biodiversity offset are considered.⁷²⁹

Even when the development of OWE incidentally affects the species, based on subsection 73(6), the permit must contain terms and conditions necessary for protecting the

solution has been adopted; and (b) all feasible measures will be taken to minimize the impact of the activity on the species' critical habitat.

Section 77(1)(a) echoes an overarching principle of examining policy choices at the time of policy making, which should aim at selecting the options that have the least ecological impact.

⁷²³ Species at Risk Act (n 694) s 73(3)(a).

⁷²⁴ Government of Canada, 'Species at Risk Permitting Policy [Proposed]' (n 721) 7.

⁷²⁵ Species at Risk Act (n 694) s 73(3)(b).

⁷²⁶ Government of Canada, 'Species at Risk Permitting Policy [Proposed]' (n 721) 8.

⁷²⁷ Species at Risk Act (n 694) s 73(3)(c).

⁷²⁸ Government of Canada, 'Species at Risk Permitting Policy [Proposed]' (n 721) 8.

⁷²⁹ *ibid* 9 and 10.

species, minimizing the impacts of OWE on the species, and providing for its recovery.⁷³⁰ The issued permit for the development of OWE must be reviewed by the competent minister if ‘an emergency order is made with respect to the species’.⁷³¹

Furthermore, there are ongoing obligations for the competent minister who permits the activity and the proponent who undertakes activities that might have adverse effects on the listed species or its critical habitats. For example, if any phase of construction, operation, or decommissioning of OWE has impacts on the listed wildlife species or their critical habitats, the minister who makes determinations about OWE projects (e.g. the Minister of Energy and Natural Resources) must notify the competent minister(s)⁷³² about this project in accordance with subsection 79(1).⁷³³

In addition, if there is any adverse effect on a listed species or its critical habitats, the proponent must identify them and must take measures to avoid or lessen the impacts and monitor them in accordance with subsection 79(2). This subsection’s requirement is an ongoing performance condition of the project because subsection 79(2) states that ‘The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.’⁷³⁴ This condition makes proponents not only responsible for avoiding or lessening the effects and monitoring them but also for the consistency of the measures with the applicable recovery strategy and action plans.

⁷³⁰ Species at Risk Act (n 694) s 73(6).

⁷³¹ *ibid* s 73(7).

⁷³² According to the definitions stated in subsection 2(1) of the Species at Risk Act, competent minister means (a) the Minister responsible for the Parks Canada Agency with respect to individuals in or on federal lands administered by that Agency; (b) the Minister of Fisheries and Oceans with respect to aquatic species, other than individuals mentioned in paragraph (a); and (c) the Minister of the Environment with respect to all other individuals.

⁷³³ Species at Risk Act (n 694) s 79(1).

⁷³⁴ *ibid* s 79(2).

However, the Act does not expressly clarify what occurs if proponents do not fulfill these statutory obligations. It seems that the Minister of the Environment and Climate Change must ensure the following conditions are met to issue a permit:

- (i) The OWE proponent must demonstrate what measures it will take to avoid, lessen, and monitor the effects of OWE at the assessment stage and before the project begins. This interpretation is based on an understanding of subsection 79(2). This provision implies that the obligation of the proponent applies to both assessment and performance phases as it requires that ‘The person ... must ensure that measures are taken to avoid or lessen those effects and to monitor them’;
- (ii) The permit or the agreement with the proponent must contain the consequences of breaching these conditions. This consequence can be inserted in the permit based on Subsection 73(6):

The agreement or permit must contain any terms and conditions governing the activity that the competent minister considers necessary for protecting the species, minimizing the impact of the authorized activity on the species or providing for its recovery.⁷³⁵

In any event, in accordance with subsection 73(8), one of the specified actions that the minister can take under this Act is to revoke or amend the issued permit.

The Challenges of Effective Protection

Despite protections provided in this Act, there are still other challenges that influence whether protections from the effects of developing OWEs would be effective. One of the challenges that can undermine these protections is that the listing process of

⁷³⁵ *ibid* s 73(6).

species at risk, identification of critical habitats, and action plans are slow.⁷³⁶ For example, the process of identifying critical habitat in the Gulf of Saint Lawrence for the North Atlantic right whale was slow.⁷³⁷ More generally, as of 2022, DFO had not provided listing advice for 50% of the aquatic species assessed as being at risk and it takes an average of 3.6 years to complete the listing process.⁷³⁸ The audit reports have also stated that more than half of action plans for the protection of endangered or threatened wildlife species have not been developed, although most of these species are under recovery strategy.⁷³⁹ Governmental reports on the progress of achieving objectives of recovery strategies and management plans have been lacking.⁷⁴⁰ With the rising number of species at risk, governmental organizations, particularly Environment and Climate Change Canada should develop recovery plans and implementation reports to protect species at risk and their habitats.⁷⁴¹

If species at risk and their critical habitats are not identified in a timely manner and face considerable delay, new developments such as OWEs might cause negative effects on such species and their habitats. In addition, when authorizations are issued for marine development activities, which may cause incidental harm, a lack of definitions, policies, scientific guidance, and precautions may compromise the effective protection of species at

⁷³⁶ VanderZwaag and Engler-Palma (n 697) 14; Koubrak, VanderZwaag and Worm (n 706) 3.

⁷³⁷ Koubrak, VanderZwaag and Worm (n 706) 3.

⁷³⁸ The Office of the Auditor General of Canada, 'Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada: Protecting Aquatic Species at Risk' (2022) 11 <https://www.oag-bvg.gc.ca/internet/docs/parl_cesd_202210_07_e.pdf> accessed 18 November 2024.

⁷³⁹ The Office of the Auditor General of Canada, 'Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada: Follow-up on the Recovery of Species at Risk' (2023) <https://www.oag-bvg.gc.ca/internet/docs/parl_cesd_202304_02_e.pdf> accessed 18 November 2024.

⁷⁴⁰ *ibid.*

⁷⁴¹ *ibid.*

risk.⁷⁴² For example, before issuing authorization, the competent minister must believe that ‘the activity will not jeopardize the survival or recovery of the species’.⁷⁴³ As discussed, the criterion is to examine whether the activity prevents achieving objectives set for the population and distribution of species described in the recovery strategy of the species.⁷⁴⁴

3.2.1.4 Migratory Birds Convention Act

The impacts of the construction and operation of OWE were discussed in chapter two of this thesis. With respect to birds, disturbing, displacing, and collision risks raise concerns over the location of OWE. The Migratory Birds Convention Act⁷⁴⁵ stipulates provisions to protect migratory birds against harmful activities and includes the Convention for the Protection of Migratory Birds and the related Protocol⁷⁴⁶ in a schedule.

Convention for the Protection of Migratory Birds

To protect and conserve individuals and populations of migratory birds and their nests, the Migratory Birds Convention Act identifies migratory birds and regulates certain activities such as hunting, and the shipment and export of migratory birds.⁷⁴⁷ The Convention provides a list of migratory birds in three categories: Migratory Game Birds, Migratory Insectivorous Birds, and Other Migratory Nongame Birds.⁷⁴⁸ It also identifies close seasons and bans hunting certain migratory birds at all times, and all migratory birds

⁷⁴² VanderZwaag and Engler-Palma (n 697) 20.

⁷⁴³ Species at Risk Act (n 694) s 73(3)(c).

⁷⁴⁴ Government of Canada, ‘Species at Risk Permitting Policy [Proposed]’ (n 721) 8.

⁷⁴⁵ ‘The Migratory Birds Convention Act’ SC 1994, c 22 s 4.

⁷⁴⁶ *ibid* The Protocol Between the Government of Canada and the Government of the United States of America Amending the 1916 Convention Between the United Kingdom and United States of America for the Protection of Migratory Birds in Canada and United States.

⁷⁴⁷ *ibid* s 4.

⁷⁴⁸ *ibid* art I of the Convention.

during close seasons.⁷⁴⁹ The Convention also prohibits the shipment or export of migratory birds or their eggs from any state or province during the close season of such state or province.⁷⁵⁰ Therefore, the prohibited activity under the Convention is limited to hunting, shipment, and export, and hence, does not cover other human activities that can be harmful to migratory birds and how they should be regulated.

The Protocol for the Protection of Migratory Birds

The Protocol, however, provides some general terms and principles that are generally helpful for regulating other harmful activities. The parties to the Protocol have confirmed that they are committed to conserving migratory birds through an international framework of cooperative management of migratory birds, the regulation of their take, and the protection of the places on which they depend.⁷⁵¹ The Protocol provides for the principles of management, sustainable use, and protection of migratory birds and their habitats.⁷⁵² These principles can be pursued through monitoring, regulation, enforcement, compliance, cooperation, partnership, etc.⁷⁵³ The Protocol also requires the parties to (i) take measures to prevent damage to migratory birds and their environments, and (ii) pursue cooperative arrangements to conserve habitats of populations.⁷⁵⁴ The actual implementation of this Protocol and the agreed arrangements between the parties for regulating, managing, and monitoring migratory birds remain unclear for the protection of migratory birds against the impacts of OWEs.

⁷⁴⁹ *ibid* arts II, III, IV, V of the Convention.

⁷⁵⁰ *ibid* art VI of the Convention.

⁷⁵¹ *ibid* preamble of the Protocol.

⁷⁵² *ibid* art II of the Protocol.

⁷⁵³ *ibid*.

⁷⁵⁴ *ibid* art IV of the Protocol.

The Provisions of the Act

With respect to possible impacts of OWE on migratory birds, if any activity during construction, operation, or decommissioning of OWE causes the deposit of any substance harmful to migratory birds or changes waters or places where migratory birds are located, that activity is prohibited. Subsection 5.1(1) and (2) prohibit the deposit of a substance by any person or vessel that is harmful to migratory birds. This prohibition also applies to the deposit of a substance ‘in waters, or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area’.⁷⁵⁵ The cumulative effects of disposing harmful substances in migratory birds’ habitats must be considered as well. Subsection 8.1(3) of this Act provides clear wording about cases when the deposit of a substance together with other deposits from different sources have cumulative effects and may cause “major damage” to the environment.⁷⁵⁶

Furthermore, subsection 12(1) provides an opportunity for additions and adjustments. The Governor in Council can make regulations necessary for the purposes and provisions of the Act, which include the following items:

(h) for prohibiting the killing, capturing, injuring, taking or disturbing of migratory birds or the damaging, destroying, removing or disturbing of nests;

(h.1) respecting the conditions and circumstances under which migratory birds may be killed, captured, injured, taken or disturbed, or nests may be damaged, destroyed, removed or disturbed;

⁷⁵⁵ *ibid* s 5.1(1) and (2).

⁷⁵⁶ *ibid* s 8.1(3).

(i) prescribing protection areas for migratory birds and nests, and for the control and management of those areas.⁷⁵⁷

For example, Migratory Bird Sanctuary Regulations identifies migratory bird sanctuaries and sets out these areas in the Schedule. Under subsection 10(1) of this regulation, ‘No person shall, **in a migratory bird sanctuary**, carry on any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit.’⁷⁵⁸ The identified sanctuaries in Newfoundland are i) Terra Nova Bird Sanctuary; ii) Île aux Canes Migratory Bird Sanctuary; and iii) Shepherd Island Migratory Bird Sanctuary.⁷⁵⁹ The identified sanctuaries in Nova Scotia are i) Amherst Point Bird Sanctuary; ii) Big Glace Bay Lake Bird Sanctuary; iii) Haley Lake Bird Sanctuary; iv) Kentville Bird Sanctuary; v) Port Hebert Bird Sanctuary; vi) Port Joli Bird Sanctuary; vii) Sable Island Bird Sanctuary; and viii) Sable River Bird Sanctuary.⁷⁶⁰

The designation of migratory bird sanctuaries is helpful because OWE projects should not be located in these areas. Due to the risk arising from OWE for migratory birds, sanctuaries must be regarded as areas that should be avoided or excluded from the construction/development of OWE.

However, the Act and Migratory Bird Sanctuary Regulations may not provide adequate protection. Firstly, the coverage of subsection 10(1) for the purpose of the permit is limited to cases where the activity is planned to be performed in “a migratory bird sanctuary”. While the migratory bird sanctuaries are identified in the schedule of the regulation, at the time of planning, the relevant responsible authorities must check whether

⁷⁵⁷ *ibid* s 12(1)(h), (h.1) and (i).

⁷⁵⁸ Migratory Bird Sanctuary Regulations, CRC, c 1036, s 10(1) (emphasis added).

⁷⁵⁹ *ibid* sch pt I.

⁷⁶⁰ *ibid* sch pt III.

the OWE location overlaps the sanctuaries and whether the current sanctuaries protect all migratory birds' routes and nests.⁷⁶¹ Secondly, it is not clear how far the protection goes and whether the regulations protect an individual of migratory birds or whether there should be a number of migratory birds to be protected. Thirdly, pollution from vessels and other sources is the central concern of the Act, but it does not cover other marine activities such as OWEs that pose risks to migratory birds. This central and limited application can be understood from subsection 5.1(1), which prohibits the deposit of substances in the water or places where migratory birds live.⁷⁶² Hence, the Act and/or Migratory Bird Sanctuary Regulations should be revised to protect migratory birds from risks of different phases (e.g. construction and operation) of OWE.

3.2.1.5 Canadian Environmental Protection Act

The Canadian Environmental Protection Act provides a legislative framework for pollution prevention and environmental and health protection programs. This Act offers a basis to assess and manage risks arising from petrochemical products, ocean disposals, and environmental emergencies.⁷⁶³ For example, the Act authorizes the Minister of the Environment and Climate Change to require any person to prepare and implement a pollution prevention plan.⁷⁶⁴ In addition, the Minister can regulate toxic substances by

⁷⁶¹ The migratory birds' locations and the possible OWE locations are identified in a Value Mapping Nova Scotia Offshore Wind Resources, which is produced by AEGIR. <<https://netzeroatlantic.ca/sites/default/files/2023-04/Value%20Mapping%20Nova%20Scotia%20Offshore%20Wind%20Resources.pdf>> accessed 12 February 2024.

⁷⁶² The Migratory Birds Convention Act (n 745) s 5.1(1).

⁷⁶³ Environment and Climate Change Canada, 'Understanding the Canadian Environmental Protection Act' (12 April 2021) <<https://www.canada.ca/en/services/environment/pollution-waste-management/understanding-environmental-protection-act.html>> accessed 16 April 2024.

⁷⁶⁴ Canadian Environmental Protection Act, SC 1999, c 33, s 56(1).

recommending to the Governor in Council an addition of new toxic substances to the statutory list.⁷⁶⁵

Furthermore, the disposal of a substance in an area of the sea is prohibited unless the substance is a listed waste or other matter in which case the disposal is permitted only in accordance with a Canadian permit issued under the Act.⁷⁶⁶ For instance, ocean dumping is a matter that can be addressed under the Act. As stated earlier in chapter two of this thesis, partial decommissioning is likely and in this case, OWE foundations may remain in the marine environment. For this remaining part, a permitting process is appropriate to be undertaken in this Act. This “precautionary reverse listing approach” is adopted under this Act based on the 1996 Protocol⁷⁶⁷ to the London Convention 1972⁷⁶⁸, which allows the disposal of wastes at sea only where wastes are listed under a “safe list” and a waste assessment is conducted.⁷⁶⁹ The Act includes abandonment of structures at sea as a disposal and Schedule 5 lists platforms and other structures as allowable to be disposed of pursuant to permits.⁷⁷⁰

The Act has the capacity to protect the environment against the environmental impacts of OWE in different phases through the adoption of regulations, guidelines, or standards. For example, the cutting and waste of materials during the construction phase,

⁷⁶⁵ *ibid* s 90(1).

⁷⁶⁶ *ibid* s 125(1).

⁷⁶⁷ Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 7 November 1996, entered into force 24 March 2006) 36 ILM 1.

⁷⁶⁸ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 29 December 1972, entered into force 30 August 1975) 11 ILM 1294.

⁷⁶⁹ David L Vanderzwaag, Susanna D Fuller and Ransom A Myers, ‘Canada and the Precautionary Principle/Approach in Ocean and Coastal Management: Wading and Wandering in Tricky Currents’ (2002) 34 *Ottawa L Rev* 134; Vanderzwaag (n 276) 168.

⁷⁷⁰ Canadian Environmental Protection Act, (n 764) s 127 (1) and sch 5.

noise during the construction and operation phases, and electromagnetic fields from cables are impacts that could be controlled by setting environmental regulations or standards. Although a portion of these impacts might be unavoidable in OWE projects, determining an acceptable level of such pollutants/impacts is a factor that can be addressed under this Act to prevent the degradation of environmental quality. This Act obliges the Government of Canada to “establish nationally consistent standards of environmental quality” and “protect the environment... from the risk of any adverse effects of the use and release of ...pollutants and wastes”.⁷⁷¹ For example, various regulations, guidelines, and standards have been adopted for emissions, environmental emergencies, air, soil, and water quality, pollution prevention, and waste.⁷⁷² In addition, the Minister of the Environment and Climate Change is committed to preserving the quality of the environment. Section 54(1) provides that the Minister shall issue “guidelines recommending environmental limits” for the quantity of release of substances and “codes of practice respecting pollution prevention” to control activities during various phases of the projects such as construction and operation.⁷⁷³ Such environmental limits could control the harmful impacts of OWE projects, keeping harm at an acceptable level.

3.2.1.6 Canadian Navigable Waters Act

The Canadian Navigable Waters Act has two main characteristics relevant to the discussion of the current thesis. Firstly, it applies to both federal and provincial waters and

⁷⁷¹ *ibid* s 2(1)(g), s 2(1)(j).

⁷⁷² Environment and Climate Change Canada, ‘Canadian Environmental Protection Act: Guidelines and Objectives’ <<https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/guidelines-objectives-codes-practice/guidelines-objectives.html>> accessed 11 October 2024.

⁷⁷³ Canadian Environmental Protection Act (n 764) s 54(1)(c), s 54(1)(d).

secondly, it considers the impacts of other activities on navigations. With respect to the jurisdiction of this Act, it has not made any boundaries for the application of its protective provisions. It applies to all waters, notwithstanding whether located in the provincial or federal jurisdictions. The definition of navigable water in Section 2 of the Act includes “a body of water” without delineating any boundaries and limiting the location of water.⁷⁷⁴ No other provision in this Act sets any limitation for the application of this Act. Therefore, it seems that the Act applies to all internal waters, territorial sea, and EEZ so long as the relevant body of water “is used” or “there is a reasonable likelihood that it will be used by vessels, in full or in part” for travel or transport.⁷⁷⁵

Regarding the impacts of other activities on navigation, the Act provides protective measures for the safety of navigation and safeguarding the interest of people and the environment. The reason for such protection is that endangering the navigation of vessels from other activities causes risks to the vessels and their crews who work on the vessel. It also creates pollution risks whether through the possible sinking of the vessel or the deposit of deleterious substances into the environment. Hence, the Act categorizes the activities as “major work” and “minor work”. Minor work means “any works that are likely to slightly interfere with navigation” and major work means “any works that are likely to substantially interfere with navigation”.⁷⁷⁶ The type of activity determines what protective measures should be taken under this Act.

Applying the definitions of the Act, activities in relation to OWE projects can be included in the definition of the “work” as defined in Section 2 of the Act. The definition

⁷⁷⁴ Canadian Navigable Waters Act, RSC, 1985, c N-22 s 2.

⁷⁷⁵ *ibid.*

⁷⁷⁶ *ibid* ss 2 and 28(2)(a) & (b).

includes both construction activities such as dredging, structures such as foundations and the whole turbines, any cables, as well as other activities during operation. The definition of “work” includes ‘(a) any structure, device or other thing, whether temporary or permanent, that is made by humans, including a structure, device or other thing used for the repair or maintenance of another work; and (b) any dumping of fill in any navigable water, or any excavation or dredging of materials from the bed of any navigable water’.⁷⁷⁷

The Act prohibits works including construction, placing, altering, rebuilding, removing, or decommissioning activities through or across any navigable water unless it is permitted under the Act.⁷⁷⁸ The Minister of Transport has identified major works through an order which include works that are likely to substantially interfere with navigation, including water control structures, ferry cables, bridges, causeways, and aquaculture facilities.⁷⁷⁹ This Minister’s order does not include OWE structures. Hence, unless the Regulation is amended to include such structures, it seems if, after examination of the location of the project, the development of OWE substantially interferes with navigation, it is categorized as a major work and the proponent who proposes such development must apply for the approval of the Minister of Transport in accordance with Section 5(1).⁷⁸⁰ The proponent may only construct the OWE or perform any other interfering activity with navigation when approval is issued by the Minister of Transport in accordance with Subparagraph 7(1).⁷⁸¹ In addition, the Minister of Transport also identified minor work

⁷⁷⁷ *ibid* s 2.

⁷⁷⁸ *ibid* s 3.

⁷⁷⁹ Major Works Order, SOR/2019-320.

⁷⁸⁰ Canadian Navigable Waters Act (n 774) s 5(1).

⁷⁸¹ *ibid* s 7(1).

through an order which includes works that are likely to slightly interfere with navigation. Submarine cables that meet certain criteria are designated as minor work.⁷⁸²

The Minister must consider various factors to assess the work and determine whether to issue an approval. Based on Section 7(7), the following factors are to be considered in the Minister's determination:

- (a) the characteristics of the navigable water in question;
- (b) the safety of navigation in that navigable water;
- (c) the current or anticipated navigation in that navigable water;
- (d) the impact of the work on navigation, including as a result of its construction, placement, alteration, rebuilding, removal, decommissioning, repair, maintenance, operation or use;
- (e) the impact of the work, in combination with other works, on navigation, if the Minister is provided with, or has in his or her possession, information relating to that cumulative impact;
- (f) any Indigenous knowledge that has been provided to the Minister;
- (g) any comments that he or she receives from interested persons within the period provided for under subsection (4);
- (h) the record of compliance of the owner under this Act; and
- (i) any other information or factor that he or she considers relevant.⁷⁸³

If the Minister determines that the construction of OWE is appropriate in the circumstances, he/she may issue an approval.⁷⁸⁴

⁷⁸² Minor Works Order, SOR/2021-170.

⁷⁸³ Canadian Navigable Waters Act (n 774) s 7(7).

⁷⁸⁴ *ibid* s 7(6).

3.2.1.7 Impact Assessment Act

The Impact Assessment Act delineates its boundaries by defining federal lands, which includes lands that belong to Canada (excluding the lands under the administration and control of the Commissioner of Yukon, the Northwest Territories or Nunavut), the internal waters of Canada (excluding any areas of the sea within a province), the territorial sea (excluding any areas of the sea within a province), the EEZ of Canada, the continental shelf of Canada, and reserves, surrendered lands and any other lands that are subject to the Indian Act. If OWE is in the lands defined under this Act, the effects of OWE, which include the changes to the environment or health, social or economic conditions, and the consequences of such changes, must be assessed under this Act.

Project assessments are triggered under the Impact Assessment Act when a project or physical activity is designated (a project list approach).⁷⁸⁵ The project list approach, which is called “only in if included”, means that an assessment of a project, that has a federal aspect, is triggered only if it falls under a category of designated projects established under the Act.⁷⁸⁶ Projects or physical activities that are categorized are required to be assessed under the Act unless otherwise determined by the Impact Assessment Agency.⁷⁸⁷ The Impact Assessment Act defines designated projects as one or more physical activities that are carried out in Canada or on federal lands and are designated by regulations made under subsection 109(b) of the Act or by an order of the Minister of the Environment and

⁷⁸⁵ Meinhard Doelle and A John Sinclair, ‘An Overview of the Impact Assessment Act’ in Meinhard Doelle and A John Sinclair (eds), *The Next Generation of Impact Assessment: A Critical Review of the Canadian Impact Assessment Act* (Irwin Law 2021) 55.

⁷⁸⁶ Stephen Hazell, ‘Project Impact Assessments: Triggering and Coverage’ in Meinhard Doelle and A John Sinclair (eds), *The Next Generation of Impact Assessment: A Critical Review of the Canadian Impact Assessment Act* (Irwin Law 2021) 141, 142.

⁷⁸⁷ *ibid* 142; Impact Assessment Act (n 69) s 16(1).

Climate Change under the Act under subsection 9(1).⁷⁸⁸ Projects that are not designated or do not fall under any category of the Project List are not required to be assessed unless otherwise decided by the Minister of Environment and Climate Change.⁷⁸⁹

A project may be designated by regulations based on subsections 109 (b) and 112(1)(a.2) of the Act. Under subsection 109 (b), the Governor in Council may make regulations to designate a physical activity or class of physical activities and specify which class of physical activities may be designated under subsection 112(1)(a.2).⁷⁹⁰ Under subsection 112(1)(a.2), the Minister of Environment and Climate Change may make regulations to designate a physical activity or class of physical activities from those activities identified by the Governor in Council under subsection 109(b) and provide for conditions that must be met.⁷⁹¹

Particularly, the specific regulation that applies to OWE is the Physical Activities Regulations.⁷⁹² Under the Regulations, OWE is categorized as physical activities that can be designated by the order of the Minister of the Environment and Climate Change. Subsection 2(2) of this regulation provides for physical activities and may be designated by the Minister, which includes a reference to Sections 44 and 45 of the Schedule.⁷⁹³ Section 44 is related to OWE projects that have 10 or more turbines and Section 45 applies to the expansion of an existing OWE, increasing at least 50% of the production capacity and addition of at least 10 turbines.⁷⁹⁴

⁷⁸⁸ Impact Assessment Act (n 69) s 2.

⁷⁸⁹ Hazell (n 786) 142; Impact Assessment Act (n 69) s 9(1).

⁷⁹⁰ Impact Assessment Act (n 69) s 109(b).

⁷⁹¹ *ibid* s 112(1)(a.2).

⁷⁹² Physical Activities Regulations, SOR/2019-285.

⁷⁹³ *ibid* s 2(2).

⁷⁹⁴ *ibid* schs 44 & 45.

Establishing conditions for each project requires critical project-level assessments because each project might cause specific adverse effects. Such effects vary based on the effects on fish and fish habitats, aquatic species, migratory birds, any other components of the environment, and the rights of Indigenous people (such as impacts on physical and cultural heritage, the current and traditional uses of lands, cultural structures, and health, social and economic conditions more broadly). The OWE industry in the Canadian legal, social, and cultural context is new and, scientifically, there are a lot of unknowns, and if project-level assessments are missed, significant risks may be caused.

The impact assessment may be referred by the Minister of the Environment and Climate Change, if he/she believes it is in the public interest, to a review panel under the Impact Assessment Act.⁷⁹⁵ The review panel must conduct such assessments and produce a report in accordance with Section 51 of the Impact Assessment Act. The review panel must consider the factors identified in subsection 22(1) when determining the impacts of an OWE project. The factors to be considered, among others, consist of changes to the environment or changes to health, social or economic conditions, the likely cumulative effects, technically and economically feasible mitigation measures, the impacts on Indigenous peoples and their rights, the purpose and need for the project, alternative, but technically and economically feasible, ways to carry out the project, its potential contribution to sustainability, and its contribution to meeting commitments related to environmental obligations and climate change.⁷⁹⁶ It seems that OWE projects of likely

⁷⁹⁵ Impact Assessment Act (n 69) s 36(1).

⁷⁹⁶ *ibid* s 22(1).

significant impacts should be referred to the panel and these factors, which contribute to sustainability, should be employed to foster the sustainable development of OWE.

An effective impact assessment also requires consideration of a wide range of purposes in the assessment process. Subsection 6(1) identifies various purposes of the Act, which include fostering sustainability, protecting the environment, and health, social, and economic conditions against the adverse effects of a project, establishing a fair, predictable, and efficient process for sustainable economic development, and considering other matters such as rights of Indigenous people, all positive and negative consequences, alternative means of performing the project, best available technologies, and the assessment of the cumulative effects.⁷⁹⁷ In addition, when the decision-making authorities want to administer this Act and decide on the project, they must exercise their power to foster sustainability, respect the rights of Indigenous people, and apply the precautionary principle.⁷⁹⁸

In the federal assessment process, final decision-making is based on the public interest. Under subsections 60(1) and 63 of the Impact Assessment Act, the Minister is required to decide whether the adverse effects of OWE projects within federal jurisdiction are in the public interest.⁷⁹⁹ The Minister must consider various factors such as the contribution of the project to sustainability, the extent to which the adverse effects are significant, the implementation of the mitigation measures in the Minister's opinion, the impacts on any Indigenous group and their rights, and the contribution to 'the Government of Canada's ability to meet its environmental obligations and its commitments in respect

⁷⁹⁷ *ibid* s 6(1).

⁷⁹⁸ *ibid* s 6(2).

⁷⁹⁹ *ibid* s 60(1).

of climate change'.⁸⁰⁰ Such assessment must be conducted, a report is produced, and if conditions under the Impact Assessment Act are met, a permit, subject to conditions set by the Impact Assessment Agency.

In addition to project-level assessments, the Impact Assessment Act also provides a legislative basis for strategic and regional assessments. The Act does not offer any criteria for triggering such assessments or when such assessments are required under the Act.⁸⁰¹ However, under Section 92 of this Act, the Minister may establish a committee or authorize the Impact Assessment Agency to conduct regional assessments regarding the effects of existing or future projects in a region. The Minister of Environment and Climate Change decided in April 2022 that a regional assessment must be conducted for offshore wind development in Newfoundland and Labrador and Nova Scotia since such an assessment would inform future federal decisions of OWE under Section 44 of the Physical Activities Regulations, the effects (including the cumulative effects) regarding OWE within federal jurisdiction, potential collaboration between federal and provincial governments, and public interest in the development of OWE.⁸⁰²

Separate agreements have been made for conducting regional assessments of offshore wind development between Canada and Newfoundland and Labrador, and Canada and Nova Scotia.⁸⁰³ The agreements define study areas, which are geographical areas independent of possible assumptions for the inclusion or exclusion of locations based on

⁸⁰⁰ *ibid* s 63.

⁸⁰¹ Doelle and Sinclair (n 785) 56.

⁸⁰² 'Minister's Decision to Conduct a Regional Assessment' (2022) <<https://iaac-aeic.gc.ca/050/evaluations/document/144376>> accessed 7 October 2022.

⁸⁰³ 'Agreement to Conduct a Regional Assessment of Offshore Wind Development in Nova Scotia' <<https://iaac-aeic.gc.ca/050/documents/p83514/147038E.pdf>> accessed 19 December 2023; 'Agreement to Conduct a Regional Assessment of Offshore Wind Development in Newfoundland and Labrador' <<https://iaac-aeic.gc.ca/050/documents/p84343/147037E.pdf>> accessed 19 December 2023.

potential environmental, health, social, or economic effects.⁸⁰⁴ The purpose of these assessments is to inform about such potential effects and how future planning, licensing, and impact assessment processes can be improved.⁸⁰⁵ The established committees have published the Final Reports of Regional Assessment of Offshore Wind Development in Nova Scotia and Newfoundland and Labrador in January 2023.⁸⁰⁶

Of relevance to this thesis is the Report of Regional Assessment of Offshore Wind Development in Nova Scotia (the Report). This Report has considered a defined area of approximately 300,000 square kilometres⁸⁰⁷ but focused on specific areas defined as Potential Development Areas (PDAs) to narrow the scope of the study.⁸⁰⁸ The Report identifies eight PDAs, including Tier 1 areas, which are recommended for immediate consideration for OWE development. Tier 1 includes Sydney Bight, French Bank, Middle Bank, Sable Island Bank, and Western Emerald Bank.⁸⁰⁹ Tier 2 areas require further studies before they are elevated to Tier 1 areas. Tier 2 includes Misaine Bank, LaHave Basin, and Canso Bank.⁸¹⁰

⁸⁰⁴ ‘Agreement to Conduct a Regional Assessment of Offshore Wind Development in Nova Scotia’ (n 803) para 1.1; ‘Agreement to Conduct a Regional Assessment of Offshore Wind Development in Newfoundland and Labrador’ (n 803) para 1.1.

⁸⁰⁵ ‘Agreement to Conduct a Regional Assessment of Offshore Wind Development in Nova Scotia’ (n 803) para 1.4; ‘Agreement to Conduct a Regional Assessment of Offshore Wind Development in Newfoundland and Labrador’ (n 803) para 1.4.

⁸⁰⁶ ‘Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report’ (2025) <<https://www.iaac-aeic.gc.ca/050/documents/p83514/160595E.pdf>> accessed 7 February 2025; ‘Final Report: Regional Assessment of Offshore Wind Development in Newfoundland and Labrador’ (2025) <<https://iaac-aeic.gc.ca/050/documents/p84343/160594E.pdf>> accessed 21 February 2025.

⁸⁰⁷ ‘Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report’ (n 806) 39.

⁸⁰⁸ *ibid* 232.

⁸⁰⁹ *ibid* 25, 242.

⁸¹⁰ *ibid* 25, 243.

To identify PDAs, the Report considered three factors. First, primary physical factors such as wind resources, water depth, and surficial geology.⁸¹¹ Second, conservation constraints such as marine protected areas (e.g. the Gully, St. Ann’s Bank, and the Laurentian Channel), critical habitat (e.g. North Atlantic right whale and northern bottlenose whale), national park reserves (e.g. Sable Island National Park Reserve) and marine bird sanctuaries (e.g. Big Glace Bay, Port Joli, Sable River, Port Herbert, Haley Lake, and Sable Island).⁸¹² Third, functional constraints, which include sensitive areas and commercial fisheries.⁸¹³ For these areas, avoidance and mitigation measures may enable OWE development.⁸¹⁴ These sensitive areas comprise significant benthic areas and ecologically and biologically significant areas (i.e., coral and sponge areas and sea pen areas), important habitats for sensitive species, i.e., habitat for species at risk or important spawning areas, and marine conservation network sites.⁸¹⁵ It should also be noted that it is almost common feedback from DFO or Environment and Climate Change Canada that there are overlaps between PDAs and most of the following species/areas i) The species at risk and their habitats such as the leatherback sea turtle, blue whale, fin whale, North Atlantic right whale, Atlantic wolffish, spotted wolffish, northern wolffish, and white shark; ii) ecologically and biologically significant area; (iii) significant benthic areas; (iv) marine bird species; (v) marine mammals; (vi) marine refuge; (vii) fish species (other than species at risk).⁸¹⁶

⁸¹¹ *ibid* 233.

⁸¹² *ibid* 236.

⁸¹³ *ibid* 240.

⁸¹⁴ *ibid*.

⁸¹⁵ *ibid*.

⁸¹⁶ *ibid* 251–309.

The Report finally provides some recommendations. It recommends supporting the ongoing research by federal authorities to create a comprehensive and adaptable marine spatial plan.⁸¹⁷ In light of the presence of a large number of migratory and resident birds, the report also recommends that Environment and Climate Change Canada should continue research on species at risk in the regional assessment study area and identify research priorities related to PDAs and adjacent waters.⁸¹⁸ In addition, considering that more than 21 species of marine mammals including some species at risk are present in the study area of this regional assessment, the report recommends that further research is conducted in relation to their seasonal abundance and distribution and likely interactions with OWE activities.⁸¹⁹ In addition, the Report, as a reflection of the precautionary approach and proactive protection measure, considers a 25-kilometer buffer from the coast and around Sable Island where no OWE should be developed in order to avoid any conflict with fisheries, migratory bird corridors, bats, shipping, and visual impacts.⁸²⁰ This buffer does not mean there will be no conflict between OWE and the marine environment and other sectors because OWE cables may cause such adverse effects that should be considered at the planning stage.⁸²¹

The Report, however, has not considered several critical points. First, the Report categorizes sensitive areas including ecologically and biologically significant areas into functional considerations, which may allow OWE development in these areas, although avoidance and mitigation measures should be taken. The sensitive areas should be

⁸¹⁷ *ibid* 369.

⁸¹⁸ *ibid* 370.

⁸¹⁹ *ibid* 371.

⁸²⁰ *ibid* 241.

⁸²¹ *ibid*.

considered as primary factors that prohibit OWE development unless developers can prove that OWE projects will not have adverse effects on these areas. The Conference of the Parties to the Convention on Biological Diversity recommends that the Parties to the Convention stop activities that degrade or cause the loss of ecologically important ecosystems and habitats and prevent unsustainable human activities that have significant adverse effects on marine and coastal areas, particularly the ecologically or biologically significant areas.⁸²² Second, the Report does not expressly state the effects of primary factors. Identifying current marine protected areas, critical habitats, national park reserves, and marine bird sanctuaries signifies that these areas must be excluded from PDAs. In other words, based on the precautionary principle, OWE should not be developed in these areas. This matter should have been part of the recommendations of this Report. Third, buffer zones for marine protected areas should also have been considered and recommended because it appears that some PDAs such as Sydney Bight and Sable Island Bank are close to marine protected areas.⁸²³ Fourth, any effect of OWE development on the network of marine protected areas⁸²⁴ as well as any potential marine protected areas should have been considered in the Report. Fifth, the Report should have offered guidance on the regulatory measures that can be taken to protect marine ecosystems against the adverse effects of

⁸²² The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity’ (2010) COP 10 Decision X/29 paras 72, 73 <<https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-29-en.pdf>> accessed 5 March 2024.

⁸²³ Government of Canada, ‘National Framework for Establishing and Managing Marine Protected Areas’ (1999) <<https://www.dfo-mpo.gc.ca/oceans/publications/mpaframework-cadrezpm/index-eng.html>> accessed 13 December 2024. In this framework, buffer zones are described as ‘areas defined around the MPA to protect it from unnecessary encroachment of human activities that may damage important species or habitats of the MPA’s ecosystem. Uses within buffer zones are managed in a manner that conserves and protects the marine resources and habitats within the MPA’.

⁸²⁴ ‘Canada’s Federal Marine Protected Areas Strategy’ (2005) 3, 7, and 8 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/315822e.pdf>> accessed 20 November 2023.

OWE. Although the Report reviewed the existing conditions of ecosystem components, it lacks recommendations and regulatory measures in this regard. Sixth, the Report does not assess the baseline conditions and whether the existing environmental status is good, healthy, and resilient enough to absorb the disturbances arising from OWE development. Seventh, the coexistence between OWE and commercial fisheries recommended in the Report should have been made with caution. As discussed in chapter two of this thesis, OWE sites may act as marine protected areas⁸²⁵ and the hard-bottom habitat created by OWE foundations may increase the quantity of hard-bottom species.⁸²⁶ The likely ecological benefits arising from the artificial reef effects of OWE foundations and scour protections and exclusion of commercial fisheries could be neutralized by allowing coexistence between OWE and commercial fisheries. Eighth, SEA is not mentioned as one of the main tools for assessing plans and alternatives.

3.2.1.8 Canadian Energy Regulator Act

The Canadian Energy Regulator Act has multiple objectives that are relevant to the context of sustainable development of OWE. This Act aims to regulate certain energy matters which fall within the Parliament's jurisdiction. Safety, security, efficiency, protection of people, property, and the environment in construction, operation, and abandonment of renewable energy projects and power lines as well as fair, inclusive, transparent, and efficient decision-making process are within the purpose of this Act.⁸²⁷ Achieving these purposes has been under public scrutiny.

⁸²⁵ Langhamer (n 337) 2 & 3.

⁸²⁶ Krone and others (n 332) 10.

⁸²⁷ Canadian Energy Regulator Act (n 132) s 6 (a),(b) & (d).

The public raised various concerns when the previous Act, known as the National Energy Board Act,⁸²⁸ was under review to be modernized. NEB was seen as unable to meet different social and environmental objectives.⁸²⁹ NEB's proceedings exacerbated the conflicts between the competing industry and environmental interests.⁸³⁰ Protection of the environment and considering environmental problems such as climate change in decision-making were proposed to be considered as factors in decision-making processes.⁸³¹ It was also suggested that NEB must align itself to the government's social, economic, environmental, and energy goals with a caution that said government's policies should be available, clear, and consistent with legislative mandates.⁸³² In addition, Canadians' confidence in the efficacy of NEB was undermined as it was thought that NEB was captured by the oil and gas industry and tended to be biased towards the industry.⁸³³

Another concern was that NEB's structure and processes were not inclusive, implying that governance structure and decision-making processes should be reformed. It was discussed that the engagement of Indigenous people in the process, institutions, and decision-making under the Act was not sufficient.⁸³⁴ NEB should recognize public engagement and Indigenous people's rights and provide them with an opportunity to

⁸²⁸ National Energy Board Act, RSC 1985, c N-7.

⁸²⁹ The Expert Panel on the Modernization of the National Energy Board, 'FORWARD, TOGETHER – Enabling Canada's Clean, Safe, and Secure Energy Future – Report' 6, 7 <https://publications.gc.ca/collections/collection_2017/rncan-nrcan/M4-149-2017-1-eng.pdf> accessed 16 February 2024.

⁸³⁰ *ibid* 7.

⁸³¹ *ibid*.

⁸³² *ibid* 12.

⁸³³ *ibid* 7.

⁸³⁴ *ibid* 8.

participate in projects' decision-making.⁸³⁵ NEB needed to learn from Indigenous people's worldview that considers humanity as part of a larger life and accepts the duty of respect and care, making sure of safe, secure, and environmentally benign energy pipelines and transmission lines.⁸³⁶ Enhancing diversity and representation of Indigenous people in the board and hearing commissioners were requested.

To address these concerns, Bill C-69 was passed in 2019, becoming the Canadian Energy Regulator Act. This Act established an independent body called the Canadian Energy Regulator, which is mandated to make transparent decisions, oversee projects related to pipelines, interprovincial and international power lines, and make any decision under this Act or any other Act of Parliament.⁸³⁷ The Regulator has a board of directors and at least one of them must be an Indigenous person. The Regulator has a Commission, which consists of seven commissioners and has several mandates.⁸³⁸

Whether having the transparency mandate of the Regulator and the institutional changes have reduced concerns and whether the Act is modernized are questions that are out of the scope of this thesis and require separate substantive work.⁸³⁹

Turning to the application of this Act to OWE, definitions of the Act clearly make room for its application to OWE. The Act defines the offshore area and includes in this definition any part of the internal waters of Canada and territorial sea (excluding the parts

⁸³⁵ Evan W Dixon and others, 'Bill C-69: Introducing the Canadian Energy Regulator and the Impact Assessment Agency' (2019) 7 *Energy Regulation Quarterly* <<https://energyregulationquarterly.ca/articles/bill-c-69-introducing-the-canadian-energy-regulator-and-the-impact-assessment-agency#sthash.aedovHET.dpbs>> accessed 13 February 2024.

⁸³⁶ The Expert Panel on the Modernization of the National Energy Board (n 829) 8, 11.

⁸³⁷ Canadian Energy Regulator Act (n 132) ss 10 (1) and 11.

⁸³⁸ *ibid* s 26 (1).

⁸³⁹ See discussion in Ron Wallace, 'A "Modernized" NEB? The CER Report on Canada's Energy Future 2023' (2023) 11 *Energy Regulation Quarterly* 34.

situated in a province or onshore), the continental shelf of Canada, and the waters superjacent to the seabed of that shelf.⁸⁴⁰ The Act also defines offshore renewable energy projects.⁸⁴¹ Based on this definition, research or assessment related to the exploration or potential exploitation of OWE, any exploitation of OWE, and any storage of energy from OWE, can be included and covered under this Act.⁸⁴² Facilities constructed or operated to transmit electricity from OWE project to a province or a place outside Canada are defined as “offshore power line”.⁸⁴³ However, Part 5 of this Act related to offshore renewable energy projects and offshore power lines and any regulations made under this Act do not apply within the offshore area under the 2024 Act.⁸⁴⁴ In other words, the discussions in this section of this thesis do not apply to any OWE projects and related offshore lines that fall within the offshore areas under the jurisdiction of the Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation and Offshore Renewable Energy Management Act and the Canada–Newfoundland and Labrador Atlantic Accord Implementation and Offshore Renewable Energy Management Act, both cited under the 2024 Act.

Turning back to the discussion on the Canadian Energy Regulator Act, this Act makes it clear that performing any work or activity related to OWE in offshore areas or

⁸⁴⁰ Canadian Energy Regulator Act (n 132) s 2.

⁸⁴¹ In accordance with Section 2 of this Act, ‘offshore renewable energy project means any of the following that are carried on in the offshore area: (a) any research or assessment conducted in relation to the exploitation or potential exploitation of a renewable resource to produce energy; (b) any exploitation of a renewable resource to produce energy; (c) any storage of energy produced from a renewable resource; or (d) any transmission of such energy, other than the transmission of electricity to a province or a place outside Canada’.

⁸⁴² Canadian Energy Regulator Act (n 132) s 2.

⁸⁴³ *ibid.*

⁸⁴⁴ An Act to Amend the Canada–Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to Make Consequential Amendments to Other Acts (n 68) s 113(2).

related to the construction, operation, or abandonment of offshore power lines in a province is prohibited under Section 297 unless authorization is obtained pursuant to Section 298.⁸⁴⁵ The Commission responsible for reviewing applications must consider some factors in its determination for issuing authorization. The factors that can be related to OWE projects are the environmental effects (including the cumulative effects), safety and security of people, property, and the environment, the health, social and economic effects, the interests and concerns of Indigenous peoples and the effects on their rights, and the contribution of the project in meeting Canada's commitments related to climate change.⁸⁴⁶

The OWE projects that are regulated under the Canadian Energy Regulator Act must undergo impact assessments under the Impact Assessment Act. As stated before, OWE projects that meet the specifications under the Physical Activities Regulations must be assessed. In circumstances in which an issue falls within the ambit of both Acts, an integrated impact assessment is to be considered by the Impact Assessment Agency, which is to be supported by the Canadian Energy Regulator. Such integrated impact assessments are single assessments conducted by a review panel subject to satisfaction of the requirements stated under both the Impact Assessment Act and the Canadian Energy Regulator Act.⁸⁴⁷

⁸⁴⁵ Canadian Energy Regulator Act (n 132) ss 297 and 298. The proposed Canada Offshore Renewable Energy Regulations in 2024 also operationalize Part 5 of the CER Act. This proposed Regulation establishes requirements related to the work and activities of offshore renewable energy projects and offshore power lines for the purposes of safety, security, and environmental protection. See <<https://canadagazette.gc.ca/rp-pr/p1/2024/2024-02-24/html/reg2-eng.html>> accessed 8 May 2024.

⁸⁴⁶ *ibid* s 183(2).

⁸⁴⁷ Canada Energy Regulator Government of Canada, 'CER – Integrated Impact Assessments' (19 April 2022) <<https://www.cer-rec.gc.ca/en/applications-hearings/view-applications-projects/integrated-impact-assessments/index.html#s2>> accessed 16 February 2024; Impact Assessment Agency of Canada, 'Memorandum of Understanding Concerning Integrated Impact Assessments under the Impact Assessment Act between the Impact Assessment Agency of Canada and the Canadian Energy Regulator' (15 November 2019) <<https://www.canada.ca/en/impact-assessment-agency/corporate/acts-regulations/legislation-regulations/memorandum-understanding-iaac-cer.html>> accessed 17 April 2024.

Finally, the “Canada Offshore Renewable Energy Regulations” (the proposed Regulations) were proposed in February 2024 to operationalize Part 5 of the Canadian Energy Regulator Act (Offshore Renewable Energy Projects and Offshore Power Lines) by setting requirements for operators of offshore renewable energy projects to protect safety, security, and the environment. The proposed Regulations require operators to notify the Regulator under the Canadian Energy Regulator Act, investigate and report a reportable incidence, which includes “any adverse impact on the environment, the production of debris or the introduction into the environment of any substance or form of energy that is likely to hurt the environment, unless that adverse impact, production or introduction is authorized or explicitly anticipated in an application for authorization”.⁸⁴⁸ The proposed Regulations also require operators to demonstrate that work or activities will be performed in a way that protects the environment and that all applicable laws will be complied with.⁸⁴⁹ In addition, the authorization of work under subsection 298(9) of the Canadian Energy Regulator Act and Article 6(1) of the proposed Regulations is conditional upon the operator developing and implementing the environmental protection plan (EPP) before the authorized work or activities begin. The environmental protection plan must contain procedures, practices, and resources to manage environmental hazards.⁸⁵⁰ It must include: a description of the integration of EPP into management systems; compliance mechanisms; a description of processes for identification of environmental hazards and risk assessments; measures to anticipate, monitor, avoid, and minimize environmental risks; evaluation

⁸⁴⁸ Government of Canada, ‘Canada Offshore Renewable Energy Regulations’ (Government of Canada, Public Works and Government Services Canada, Integrated Services Branch, Canada Gazette 2024) Canada Gazette, Part 1, Volume 158, Number 8 arts 1 & 50 <<https://canadagazette.gc.ca/rp-pr/p1/2024/2024-02-24/html/reg2-eng.html>> accessed 8 May 2024.

⁸⁴⁹ *ibid* art 3.

⁸⁵⁰ *ibid* art 9.

processes for ensuring the effectiveness of such measures; description of facilities, equipment, and systems required for the protection of the environment; organizational structures to minimize environmental hazards; and description of monitoring and evaluating the compliance of measures with the objectives of EPP.⁸⁵¹

The proposed Regulations, however, have some limitations. The proposed Regulations do not provide a comprehensive regulatory framework for offshore renewable energy (including OWE) because such Regulations under the Canadian Energy Regulator Act are limited to requiring the operators to take action. They do not provide any specific environmental regulations, standards, or best practices for operators to comply with. In addition, no provision is set out on the consequences of non-compliance with the obligations under the proposed Regulations. However, it can be understood from Article 298(10) of the Canadian Energy Regulator Act that compliance with regulations is an ongoing condition for the operator under the given authorization under the Canadian Energy Regulator Act. This subsection states that “Every authorization is subject to the condition that the provisions of this Act and of the regulations, as well as every order made under the authority of this Act, will be complied with”. In case of non-compliance with a condition of the authorization, the Commission established under the Canadian Energy Regulator Act may suspend or revoke the authorization.⁸⁵²

Nonetheless, it can also be argued that neither the Canadian Energy Regulator Act nor the proposed Regulations contain adequate liability mechanisms for cases of operators’ non-compliance with the proposed Regulations and obligations under the EPP, particularly

⁸⁵¹ *ibid.*

⁸⁵² Canadian Energy Regulator Act (n 132) s 301(1).

after the work or activities begin. The Canadian Energy Regulator Act only covers “liability for loss, damage, costs or expenses related to debris” and does not cover compensation mechanisms for any other environmental loss or damage.⁸⁵³

3.2.1.9 Canada Shipping Act

The Canada Shipping Act⁸⁵⁴ is relevant to the context of OWE as ships are used to provide goods and services for the development of OWE. The potential pollution and noise from ships add pollution to the marine environment, creating cumulative effects from OWE development. This Act establishes strict liability on ship owners for damaging the marine environment by oil pollution or garbage discharges from ships.⁸⁵⁵ However, it does not expressly require the application of the precautionary principle. For example, a reverse listing, which only allows listed substances to be discharged from ships to the environment is a strong application of this principle.⁸⁵⁶ The relevant international recommendations on the reduction of underwater noise from ships, including the IMO guidelines, are other precautionary measures that will be discussed in the next chapter.

3.2.1.10 Cross-cutting Policies and Other Initiatives

The following policies are called cross-cutting policies because they can either be categorized under different Acts of the Parliament or it is hard to identify under which Act they can be categorized. However, their main purpose is shared, which is the protection of the environment.

⁸⁵³ *ibid* s 298(9)(c).

⁸⁵⁴ Canada Shipping Act, SC 2001, c 26.

⁸⁵⁵ Vanderzwaag, Fuller and Myers (n 769) 139.

⁸⁵⁶ *ibid*.

3.2.1.10.1 Canada's Oceans Protection Plan

Canada's Oceans Protection Plan launched in 2016 is committed to improving marine safety and minimizing environmental harm from shipping.⁸⁵⁷ Over 50 initiatives have been implemented to enhance marine safety, advance research, and protect coastal ecosystems nationwide.⁸⁵⁸ This Plan can be advanced through the development of safety systems, management activities, particularly response plans, and compensatory measures for the restoration and preservation of the environment, and protection of whales.⁸⁵⁹

Canada's Oceans Protection Plan can be relevant to OWE. This Plan calls for a stronger polluter-pay principle. For conservation measures to be effective, establishing a fund for response and clean-up is critical to make the polluter responsible. The Government of Canada wants to amend the Canadian Ship-Source Oil Pollution Fund⁸⁶⁰ to secure adequate industry-funded compensation for those affected by oil spills.⁸⁶¹ While spill pollution is a risk arising from ships providing goods or services during construction and operation of OWE projects, OWE facilities themselves can cause pollution including waste, noise, and electromagnetic fields. In case the pollution from the installation and operation of OWE facilities cannot be avoided, prevented, or reduced, operators should be made liable for this pollution. In addition, pollution funds under this program should not

⁸⁵⁷ Transport Canada, 'Report to Canadians: Investing in Our Coasts through the Oceans Protection Plan' (*AEAD*) <<https://tc.canada.ca/en/initiatives/oceans-protection-plan/report-canadians-investing-our-coasts-through-oceans-protection-plan>> accessed 27 June 2024.

⁸⁵⁸ *ibid.*

⁸⁵⁹ Government of Canada, 'Canada's Oceans Protection Plan' 1 <https://tc.canada.ca/sites/default/files/migrated/oceans_protection_plan.pdf> accessed 20 November 2023.

⁸⁶⁰ The Ship-source Oil Pollution Fund is established under the Marine Liability Act. This Fund investigates and pays for claims arising from oil spills of all classes of ships in Canada. It also makes Canada's contribution payments to the International Oil Pollution Compensation Fund.

⁸⁶¹ Government of Canada, 'Canada's Oceans Protection Plan' (n 859) 4.

be only available for people who are damaged because of pollution, but it should also include the allocation of funds for the restoration of the environment as a result of pollution.

3.2.1.10.2 Canada's Federal Marine Protected Areas Strategy

Marine protected areas and their network are important when OWE projects are planned.⁸⁶² Marine protected areas and the creation of a network among them are ecologically important because they are considered complementary to fisheries management and contribute to the protection of habitats of highly migratory and transboundary species.⁸⁶³ In addition, a central feature of an effective establishment of marine protected areas is to benefit from ascertaining a cohesive and complementary network of marine protected areas, which is produced within integrated management from cooperation and collaboration between different levels of governments together with stakeholders and Indigenous people.⁸⁶⁴ A network of marine protected areas shields marine ecosystems against local human-induced changes, anthropogenic pressures, and over-exploitation.⁸⁶⁵ Canada's Federal Marine Protected Areas Strategy, which was adopted in 2005, aims to create a strategic foundation for decision-making on establishing marine protected areas to protect oceans from environmental degradation.⁸⁶⁶

⁸⁶² 'Canada's Federal Marine Protected Areas Strategy' (n 824) 4, 8. The Strategy adopts the definition of World Conservation Union, International Union for Conservation of Nature (IUCN) for marine protected areas: 'Any area of intertidal or subtidal terrain, together with its overlying water and associated flora and fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment'. The Strategy also defines a marine protected areas network as: 'A set of complementary and ecologically linked marine protected areas, consisting of a broad spectrum of marine protected areas, established and managed within a sustainable ocean management planning framework and linked to transboundary, global and terrestrial protected area networks.'

⁸⁶³ *ibid* 8.

⁸⁶⁴ *ibid* 3.

⁸⁶⁵ *ibid* 8.

⁸⁶⁶ *ibid* 3.

The objective of this Strategy is worth mentioning here as it is highly relevant to ecological sustainability:

This Federal Marine Protected Areas Strategy helps set the foundation for developing a marine protected areas network in Canada and aims to increase the ecological effectiveness and connectivity between individual marine protected areas in an effort to conserve and protect the structure and function of marine ecosystems.⁸⁶⁷

Creating a network of marine protected areas can be on different local, hemispheric, and global scales, which promote connections among them that transcend human-made boundaries and connect marine protected areas with terrestrial protected areas.⁸⁶⁸ Establishing such a network needs to be considered in integrated ocean management.⁸⁶⁹

DFO as a leader under the Oceans Act, collectively with Environment Canada and Parks Canada, has considerable roles and responsibilities in creating this network.⁸⁷⁰ To do so, they need to adopt a systematic approach, promote collaborative management, raise public awareness, and connect Canada's network of marine protected areas to continental and global networks.⁸⁷¹

According to the Strategy, Canada's federal marine protected areas can be divided into three types of programs: i) Oceans Act Marine Protected Areas whose targets are conservation and protection of fishes, their marine habitats, endangered marine species, and the areas of high biological productivity or biodiversity;⁸⁷² ii) Marine Wildlife Areas

⁸⁶⁷ *ibid* 8.

⁸⁶⁸ *ibid* 7.

⁸⁶⁹ *ibid*.

⁸⁷⁰ *ibid* 3.

⁸⁷¹ *ibid* 3, 4, 8.

⁸⁷² *ibid* 4.

whose objective is the protection and preservation of wildlife habitats e.g., the habitats of migratory birds and endangered species;⁸⁷³ and iii) National Marine Conservation Areas which are designated to protect and preserve ‘representative examples of Canada’s natural and cultural marine heritage’ and promote education and enjoyment among the public.⁸⁷⁴

This list is not, however, exhaustive, and other areas such as Migratory Bird Sanctuaries, National Wildlife Areas, National Parks with a marine component, marine refuges, and ecologically significant areas can be identified and included under the scope of marine protected areas and need to be avoided in developing OWE.⁸⁷⁵ For example, the Eastern Canyons Conservation Area (Marine refuge), which is in the Nova Scotia Shelf, is designated to protect cold-water corals and a deep-water frontier area⁸⁷⁶ and prohibit fishing gear in the marine refuge unless it falls within the exceptions specified for this area.⁸⁷⁷ Another example is Hawke Channel Closure, which is in Newfoundland-Labrador Shelves, and it is identified to protect the Atlantic cod and the overlapping Ecologically and Biologically Significant Area, which aims to protect benthic species including populations of groundfish. Bottom trawl, gillnet, and longline are prohibited, but OWE, which may have similar effects, should be prohibited in these areas. Further marine refuges and ecologically significant areas can be also designated under the Fisheries Act.

⁸⁷³ *ibid.*

⁸⁷⁴ *ibid* 5.

⁸⁷⁵ *ibid.*

⁸⁷⁶ Fisheries and Oceans Canada Government of Canada, ‘Canada’s Marine Protected and Conserved Areas’ (19 September 2019) <<https://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html>> accessed 23 November 2023.

⁸⁷⁷ *ibid.*

3.2.1.10.3 Federal Marine Protected Areas: Protection Standard 2023

The Protection Standard 2023 is set to protect oceans from human activities by providing clarity on the prohibition of activities in the federal marine protected areas.⁸⁷⁸ It cuts across the responsibilities of various departments because it applies to the following:

- Marine protected areas established by DFO under the Oceans Act,
- The National Marine Conservation Areas,
- Marine components of National Parks established by the Parks Canada Agency,
- The Marine National Wildlife Areas,
- Marine portions of National Wildlife Areas and Migratory Bird Sanctuaries established by Environment and Climate Change Canada.⁸⁷⁹

Bans under the Standard apply to certain areas and are based on a specific date. They also only apply to activities occurring within the boundaries that are set for the marine protected areas.⁸⁸⁰ The Standard excludes from the application of two types of marine protected areas: i) Marine protected areas that enjoy mirror federal or provincial or territorial laws and are developed uniquely for a single marine protected area; ii) Marine protected areas that are established by ministerial orders or emergency order-in-council under the Oceans Act.⁸⁸¹ However, the Standard applies to the federal marine protected areas even if they are established under both federal and provincial or territorial laws.⁸⁸²

⁸⁷⁸ Fisheries and Oceans Canada, 'Federal Marine Protected Areas: Protection Standard 2023' (2023) 3 <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41110353.pdf>> accessed 23 November 2023.

⁸⁷⁹ *ibid* 4.

⁸⁸⁰ *ibid*.

⁸⁸¹ *ibid*.

⁸⁸² *ibid*.

For the purpose of the application, the Standard categorizes activities based on whether they fall before 25 April 2019 or afterward.

Bans under the Standard also apply to various activities. The Standard bans new oil and gas activities that fall after this time and are intended to be located within the marine protected areas defined under the Standard.⁸⁸³ The ban includes a wide range of activities, including preconstruction, exploration, exploitation, and transportation activities.⁸⁸⁴ For those existing oil and gas activities that started or developed before 25 April 2019, the relinquishment is voluntary, and if such voluntary relinquishment does not occur, the overlapping areas are not considered in meeting Canada's marine conservation targets.⁸⁸⁵ A similar prohibition also applies to other activities such as exploring or exploiting minerals or other specified substances, disposal of wastes or materials, dumping of fill, deposit of deleterious drugs and pesticides, enhanced restrictions on vessel discharges, and certain bottom trawl gear.⁸⁸⁶

OWE activities should be banned in marine protected areas. OWE is a new marine activity and this ban is not included in Protection Standard 2023. The impacts of OWE projects on the marine environment are explained in chapter two of this thesis. Because of such impacts, this Standard should be amended to prohibit OWE activities in marine protected areas.

⁸⁸³ *ibid* 5.

⁸⁸⁴ *ibid*.

⁸⁸⁵ *ibid* 6.

⁸⁸⁶ *ibid* 7.

3.2.1.10.4 Canada’s Ocean Noise Strategy and the Statement for the Mitigation of Seismic Sound

The draft of Canada’s Ocean Noise Strategy, which is published for public review, includes a set of objectives and recommendations to minimize the impacts of ocean noise on marine life.⁸⁸⁷ One of the objectives of the Strategy is to collect and integrate data to reduce the knowledge gap and promote innovation in methods and tools.⁸⁸⁸ To achieve this objective, the Strategy recommends that knowledge gaps concerning individual and population-level impacts of noise should be addressed by research and monitoring.⁸⁸⁹ The Strategy further supports researching and monitoring the distribution and habitat of marine individuals in areas that are at risk of ocean noise.⁸⁹⁰ It also supports the use of technologies that reduce the noise at sources.⁸⁹¹ Technologies should be used to reduce the noise at its sources.⁸⁹² Standardized acoustic monitoring (collection, storage, processing, and reporting) and standards should be used to help with the integration of data, the production of quality reports, and assessing the ocean noise impacts.⁸⁹³ The Strategy also recommends that evidence-based tools such as numeric criteria or acoustic thresholds should be established.⁸⁹⁴ The Strategy further sets another objective to achieve clear guidance and management action.⁸⁹⁵ It recommends establishing national guidance to support more

⁸⁸⁷ Fisheries and Oceans Canada, ‘Canada’s Ocean Noise Strategy: A Coordinated Approach to Minimize Impacts on Marine Life: Draft for Review’ (2024) <<https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41255987.pdf>> accessed 11 October 2024.

⁸⁸⁸ *ibid* 17.

⁸⁸⁹ *ibid*.

⁸⁹⁰ *ibid*.

⁸⁹¹ *ibid* 18.

⁸⁹² *ibid*.

⁸⁹³ *ibid*.

⁸⁹⁴ *ibid* 19.

⁸⁹⁵ *ibid* 20.

consistent assessment measures while taking regional and ecosystem differences into account.⁸⁹⁶ Management measures should also be evaluated by “standardized methods and indicators” to assess their effectiveness.⁸⁹⁷

This Strategy could be relevant to OWE projects in a variety of ways. Understanding the scope and severity of the impacts of noise from OWE on marine life requires exploration and quantification of the impacts of OWE on individual species and population-level impacts. Further understanding of the impacts of noise from OWE on high-density marine species and habitats of marine mammals should be promoted by conducting research and monitoring. Furthermore, those technologies that reduce noise during the construction and operation of OWE should be used. In addition, best practices, common standards, and evidence-based tools should be adopted to support integrated data for OWE projects. “Clear, evidence-based numeric criteria or acoustic thresholds” would also be helpful in assessing whether the impacts of OWE on marine species are safe. With the identification of affected species in the area where OWE is located, specific and timely measures should be taken to minimize the impacts of noise from OWE. Finally, OWE should not contravene the management objectives set for minimizing ocean noise and performing such management objectives should also be assessed by indicators.

This Strategy does not, however, provide a clear perspective on the legal outcomes. Firstly, it should contain a legal background and legal basis. For instance, it should explain how it was formed, and which Act or regulations offer a mandate to implement this Strategy. Secondly, strategies are not adequate to create legal effects for marine uses. What

⁸⁹⁶ *ibid.*

⁸⁹⁷ *ibid* 21.

happens if the OWE operators do not comply with and undermine the management objectives set for the reduction of noise? How specific thresholds will be set for each industry and what legal effects will be created if such thresholds are surpassed? Certain thresholds should be set for OWE projects so that if the OWE project does not meet them, the projects are not approved.

Before this Strategy, a “Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment” (the Statement) in 2004 provided some requirements for the planning and conduct of marine seismic surveys.⁸⁹⁸ The requirements include planning measures to avoid and minimize the effect of seismic surveys. For example, seismic surveys must avoid significant adverse effects on individual marine mammals or sea turtles listed as endangered or threatened species under the Species at Risk Act.⁸⁹⁹ It is also required to avoid any significant adverse effects on the population level of any other marine species.⁹⁰⁰ The Statement also sets requirements for minimizing the amount of energy from sound, establishing a safety zone of 500 meters from the center of the air source array, observing the safety zone before the operation, and maintaining a watch of the safety zone for surveys with certain specifications.⁹⁰¹ If a marine mammal or sea turtle listed as endangered or threatened under the Species at Risk Act or identified

⁸⁹⁸ Fisheries and Oceans Canada, ‘Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment’ <<https://www.dfo-mpo.gc.ca/oceans/publications/seismic-sismique/index-eng.html>> accessed 18 November 2024. This statement applies to seismic surveys that are conducted in Canadian marine waters and use an air source array.

⁸⁹⁹ *ibid* 6.

⁹⁰⁰ *ibid* 7.

⁹⁰¹ *ibid* 6–7.

under impacts assessment processes is observed, the air source array survey must be shut down.⁹⁰²

This Statement has taken positive steps to take the interest of marine mammals and sea turtles during the planning and operation of seismic surveys in the marine environment. For instance, although the regulatory nature and effect of this Statement are uncertain and need to be clarified under the law (e.g. the Oceans Act), the use of “must” for taking measures indicates that practices are binding during the planning and operation of seismic surveys when they contemplated under the agreement with operators. The Statement is also specific in terms of addressing a common problem arising from development activities.

Similar initiatives for capturing the interest of the marine environment are critical. For example, there are also other gaps related to noise from OWE activities such as noise during pile driving that should be regulated under specific binding rules or regulations.

3.2.1.10.5 Canada’s 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada

Canada’s 2030 Nature Strategy (Nature Strategy) devises a roadmap for halting and reversing biodiversity loss in Canada and achieving the goals and targets of the Kunming-Montreal Global Biodiversity Framework.⁹⁰³ One of the main goals of Nature Strategy is to protect 30% of Canada’s land and waters by 2030.⁹⁰⁴ The Strategy sets targets to achieve the desired goals. For example, Target 1 is to establish integrated biodiversity-inclusive spatial planning and/or effective management processes that cover all areas and aim to bring the loss of areas of high biodiversity importance (e.g. ecosystems of high ecological

⁹⁰² *ibid* 14.

⁹⁰³ Canada, ‘Canada’s 2030 Nature Strategy’ (n 9).

⁹⁰⁴ *ibid* 22.

integrity) close to zero by 2030.⁹⁰⁵ The Nature Strategy underscores the importance of including “all areas” in planning as establishing protected and conserved areas is not sufficient to achieve the goals.⁹⁰⁶ In addition, the spatial planning includes MSP. The Nature Strategy also identifies some actions that need to be taken with respect to Target 1. For example, the federal government plans to specify areas of high biodiversity importance, strengthen the value of spatial planning, establish a national inventory of spatial plans to track progress and complete the remaining planning, develop guidance to encourage biodiversity integration and build on the initial work on the identification of ecologically important areas.⁹⁰⁷

Furthermore, Target 2 of the Nature Strategy is set to ensure that at least 30% of degraded areas of ecosystems are under “effective restoration” to enrich ‘biodiversity and ecosystem functions and services, ecological integrity and connectivity’.⁹⁰⁸ Part of the actions to restore ecosystems are preventing ecosystem degradation.⁹⁰⁹ Prevention requires proponents of projects to “avoid, minimize, eliminate, control, or offset adverse effects of development”.⁹¹⁰ It is also important to define degraded areas and effective restoration, identify the degraded areas, and establish baseline conditions.⁹¹¹

Target 3 of the Nature Strategy is to ensure that at least 30% of terrestrial and inland water, and coastal and marine areas are effectively conserved and managed.⁹¹² The areas

⁹⁰⁵ *ibid* 28.

⁹⁰⁶ *ibid*.

⁹⁰⁷ *ibid* 30.

⁹⁰⁸ *ibid* 31.

⁹⁰⁹ *ibid*.

⁹¹⁰ *ibid* 34.

⁹¹¹ *ibid*.

⁹¹² *ibid* 35.

that have more importance for biodiversity and ecosystem functions and services will be particularly considered.⁹¹³ Target 4 is to ensure taking management actions to recover species, particularly threatened species.⁹¹⁴ Finally, of relevance is Target 6 of the Nature Strategy to reduce the rate of introduction of invasive species by 50% by 2030.⁹¹⁵ It can be done through elimination, minimization, reduction, and/or mitigation of the impacts of alien species on biodiversity and ecosystem services. Some actions include the identification and prevention of pathways that species are introduced.⁹¹⁶

The targets set by the Nature Strategy are critical and relevant to OWE. Chapter two of this thesis identified the likely impacts of OWE on ecosystems, which include changes in the structure, process, and functioning of ecosystems, loss and fragmentation of habitats, the introduction of invasive species, displacement, injury, or mortality of mammals and their population, effects on navigation and orientation of marine mammals, displacement, barrier effects, habitat loss, and collision risks for seabirds, and the fatality of bats. As discussed above in this section, one of the solutions to avoid these impacts is integrated planning. The most important benefit of this tool is to see the “whole” picture of pressures and impacts that the marine environment receives from human-induced activities. This approach offers guidance on what activities are a matter of concern and should be eliminated or mitigated, what other activities should be substituted, and whether OWE is among good options to be included. The planning tool also identifies which existing or potential areas should be under effective ecological protection, which areas are

⁹¹³ *ibid.*

⁹¹⁴ *ibid* 40.

⁹¹⁵ *ibid* 48.

⁹¹⁶ *ibid.*

in serious need of conservation, and which management objectives are set for the conservation of these areas. All these areas and objectives will clarify the limitations of OWE that should be considered at the time of site selection.

3.2.2 Provincial Regulatory Framework in Nova Scotia

The purpose of this section is to review and analyze key provincial laws applicable to the development of OWE. It is not possible to identify all laws and regulations related to the development of OWE as they might be applicable based on the context and location of the project. Hence, this section aims to discuss the laws and regulations such as the Environment Act that have more general applicability. The laws and regulations that designate more specific areas such as the prohibited or designated areas under the Beaches Act⁹¹⁷, Wilderness Areas Protection Act⁹¹⁸, Special Places Protection Act,⁹¹⁹ and other laws that set requirements for land use such as the Municipal Government Act⁹²⁰ depend on the planning of the specific location of a project. These more specific laws and regulations are not covered in this section of the thesis but must be considered at the time of planning and authorization of an OWE project.

3.2.2.1 Nova Scotia Environment Act

In this section, after exploring the application of the Environment Act, the key requirements stipulated by the Environment Act will be discussed. These requirements encompass various aspects such as different types of EIA as well as the requisite approvals for OWE activities, and the release of substances into the environment.

⁹¹⁷ Beaches Act, RSNS 1989 c. 32.

⁹¹⁸ Wilderness Areas Protection Act, SNS 1998 c. 27.

⁹¹⁹ Special Places Protection Act, RSNS 1989, c 438.

⁹²⁰ Municipal Government Act, SNS 1998, c. 18.

Application of the Act to OWE

OWE can be included in the definition of an undertaking under subsection 3(az) of the Nova Scotia Environment Act, providing jurisdiction for this Act to apply to OWE. According to the definition, an undertaking includes an ‘activity, project, structure, work, or proposal that, in the opinion of the Minister, causes or may cause an adverse effect or an environmental effect’.⁹²¹ The development of OWE is an activity or project that involves work and structures with likely adverse environmental effects. Accordingly, given the wide definition of an undertaking which includes any part of OWE projects and the effects of those parts, the Nova Scotia Environment Act can apply to the following areas where OWE projects are located or have environmental effects:

- Offshore areas where Nova Scotia may have historical jurisdictions such as bays, internal waters, and possibly the territorial sea (as discussed before in subsection 3.1.1.2.3 of this thesis, it may extend up to three miles off Nova Scotia) and OWE projects in whole or in part are located in such waters;
- The OWE projects in whole or in part are located on federal waters but environmental effects may transcend the federal jurisdiction;
- The environmental effects of laying cables from OWE projects towards the land;
- The environmental effects of any facilities (transmission, storage, or other facilities) on land connected to OWE.⁹²² The definition of undertaking also includes the environmental effects of an undertaking.

⁹²¹ Environment Act (n 127) s 3(az).

⁹²² Because of overlaps between the two assessments, an agreement between two governments may be made to conduct a joint assessment under Section 47.

Adverse effects of OWE projects are those consequences that impair or damage the environment or change the environment in a way that causes negative effects on human health, requiring assessment under this Act.⁹²³ Based on the definition of “environmental effects” under the Act, the environmental effects are not limited to any positive or negative effects of changes that OWE causes to the environment, but the effects also include social and economic effects and the effects on health, physical, historical, and cultural heritage.⁹²⁴ Accordingly, for the purpose of environmental assessment, the effects on the components of the earth (air, land, water, atmosphere, organisms, the interacting natural systems), as well as socio-economic, health, and cultural effects, are considered.⁹²⁵

Classes of Environmental Assessments and OWE

Depending on the scale of effects, the class of environmental assessment varies. The assessment of the environmental effects of projects falls within the scope of subsection 31(1) which applies to the undertakings determined by the Minister or prescribed in the regulations.⁹²⁶ The Minister of Environment and Climate Change determines whether an undertaking is a Class I undertaking or a Class II undertaking. The difference in environmental assessment processes between Class I and Class II under the Act and regulations indicates that Class II has more serious environmental effects than Class I, hence the review process for Class II is more stringent than Class I. While the environmental assessment process for Class I undertaking may include referral to a review panel in which an environmental assessment report is required, Class II undertaking shall

⁹²³ Environment Act (n 127) s 3(c).

⁹²⁴ *ibid* s 3(v)(i).

⁹²⁵ *ibid* s 3(r).

⁹²⁶ *ibid* s 31(1).

include referral to a review panel.⁹²⁷ If the Class I undertaking is not referred to a review panel, the Minister may approve the undertaking, reject the undertaking, or approve the undertaking with conditions.⁹²⁸

The Schedule A of the Environmental Assessment Regulations made under Section 49 of the Environment Act identifies wind power in the Class I undertakings. Schedule A. D(2)(a) of this regulation, which is Class I undertakings, mentions a wind energy generating facility that has a production rating of at least 2 MW derived from wind.⁹²⁹ Although at the time of this regulation, OWE was not intended to be included, the word “wind” was mentioned for onshore wind, this word is general enough to include wind sources for OWE. However, considering the different environmental and ecological impacts of onshore and offshore wind powers, such impacts need to be assessed to check whether OWE should be designated under Class I or Class II.

If we assume that OWE is considered a Class I undertaking, under Section 11(1) of this regulation, the environmental assessment process must include registration and may include a focus report, terms of reference, an environmental assessment report, alternate dispute resolution, and a referral to a review panel where an environmental-assessment report is required.⁹³⁰ The review by the Minister of registered information may indicate that i) ‘the adverse effects or significant environmental effects which may be caused by the undertaking are limited and that a focus report is required’; ii) ‘there may be adverse effects or significant environmental effects caused by the undertaking and an environmental

⁹²⁷ *ibid* s 38(1); Environmental Assessment Regulations, NS Reg 26/95, s 11.

⁹²⁸ Environment Act (n 127) s 38(2).

⁹²⁹ Environmental Assessment Regulations (n 927) sch A. D(2)(a).

⁹³⁰ *ibid* s 11(1).

assessment report is required’; and iii) ‘there is a likelihood that the undertaking will cause adverse effects or significant environmental effects which are unacceptable and the undertaking is rejected’.⁹³¹ For making this determination, based on Section 12 of this regulation, with respect to OWE, it can be understood and expected that the Minister considers several factors such as the location of OWE and nature and sensitivity of the surrounding area; the size, scope, and complexity of OWE; the public and indigenous concerns over environmental effects of OWE and the steps taken by the proponent to address such effects; the predictability of environmental effects of OWE in light of environmental baseline information; the potential and known adverse effects of OWE; project schedules, other undertakings in the area, and the mitigating environmental effects if the terms of license are met.⁹³²

Finally, after approval, which may contain terms and conditions that must be complied with by the proponent, is obtained from the Minister of Environment and Climate Change, the proponent shall commence work.⁹³³

Approval and Regulatory Processes for OWE

OWE is not regulated under the Activities Designation Regulations.⁹³⁴ Designated activities under the Activities Designation Regulations are required to obtain approval from the Minister or an Administrator designated by the Minister unless the activity is categorized as a type of activity that requires notification.⁹³⁵ The activities under the

⁹³¹ *ibid* s 13(1).

⁹³² *ibid* s 12.

⁹³³ Environment Act (n 127) s 32.

⁹³⁴ Activities Designation Regulations, NS Reg 47/95 s 3(1).

⁹³⁵ *ibid* ss 3(1).

Regulation, depending on their nature, may be categorized into two types: type A or type B. Type A usually requires approval and type B may require approval or notification.

Although OWE is not mentioned in the Regulations, to ensure that appropriate measures including mitigation measures are implemented with respect to OWE, the Activities Designation Regulations should be amended so that OWE is identified as a designated activity that requires approval (e.g. type A).⁹³⁶ Upon such designation, OWE would not be able to commence unless the proponent holds an appropriate class of approval under Section 50 of the Act and this regulation. If the OWE project is not in the public interest, contravenes a governmental policy, or has an unacceptable location or adverse effects, the Minister would have the discretion not to issue an approval.⁹³⁷

Approval for Release of Substances

The release of substances from the construction and operation of OWE into the environment, which may cause an adverse effect, is prohibited under Section 67 of the Nova Scotia Environment Act unless it is authorized under approval or regulations.⁹³⁸

3.2.2.2 Marine Renewable-energy Act

The Marine Renewable-energy Act has established priority areas and has the potential for new priority areas to be added. The established priority areas are the Bras d'Or and the Fundy Area of Marine Renewable-energy Priority, which are intended to be used for the development of tidal energy.⁹³⁹ Accordingly, the FORCE Marine Renewable-electricity Area has been established in the Fundy Area of Marine Renewable-energy

⁹³⁶ Activities Designation Regulations (n 934).

⁹³⁷ Environment Act (n 127) s 50.

⁹³⁸ *ibid* s 67.

⁹³⁹ Marine Renewable-Energy Act, RSNS 2015 c 32 s 10(1).

Priority under this Act and is to be used for licensing connected generators that are in-stream tidal-energy converters.⁹⁴⁰ In addition, the Act has considered the possibility of establishing an area of marine renewable-energy priority by the regulations based on the report and recommendation of the Minister of Natural Resources and Renewables.⁹⁴¹ However, although the Act defines “marine renewable-energy resources” which includes “winds blowing over marine waters”,⁹⁴² it lacks priority areas for OWE but has the possibility of establishing such an area for OWE. If such a priority area is established, the Minister may also report and recommend to the Governor in Council that a marine renewable-electricity area is established for the generation of electricity from OWE under subsection 17(1).

Establishing this area is, however, subject to some limitations. The area requires public consultation under Section 18, conducting SEA under Section 20, and considering Geographic restrictions under Section 21 of the Act. The Minister must determine whether there are any rights, interests, or exclusion areas involved under the Crown Lands Act, the Beaches Act, or the Beaches and Foreshores Act.⁹⁴³ The Minister must also determine whether there are any existing aquaculture leases, licenses, permits, or authorizations or any other sub-aquatic lands designated as aquaculture development areas under the Fisheries and Coastal Resources Act.⁹⁴⁴ Even if a marine renewable-electricity area for the

⁹⁴⁰ *ibid* s 13(1) & (2).

⁹⁴¹ *ibid* s 10(2).

⁹⁴² *ibid* s 3(1)(n).

⁹⁴³ *ibid* s 20(1)(b). It should be noted that inappropriate amendments were made to subsection 20(1)(a) under Bill no. 471 titled “An Act Respecting Advancing Nova Scotia Opportunities” in 2024. Under such amendments, regional assessment or equivalent assessment are added after strategic assessment by using “or” between them. While it is not clear what equivalent assessment means, regional assessments and strategic environmental assessments should not be allowed to be used interchangeably.

⁹⁴⁴ *ibid* ss 20(1) (c) and 21.

development of OWE is established, no person shall have the right to construct, install, or operate OWE within this area unless a permit or license is obtained.⁹⁴⁵

3.2.2.3 Endangered Species Act

The Endangered Species Act aims to protect, designate, and recover the species at risk and their habitats in the province of Nova Scotia.⁹⁴⁶ Species at risk are listed species based on the provision of this Act and are species at risk of extinction, or extirpation, or are categorized as vulnerable, threatened, or endangered.⁹⁴⁷ The listed species at risk can be found in the Categorized List of Species at Risk.⁹⁴⁸ In this Categorized List, some coastal or marine species such as Atlantic whitefish, Harlequin duck, Blanding's turtle, Piping Plover, and Roseate tern are listed. Nonetheless, the government of Nova Scotia has been criticized for failure to identify, assess, adopt recovery plans, provide review reports, and generally, protect species at risk adequately.⁹⁴⁹

To protect species at risk under the Endangered Species Act, killing, possession, disturbance, taking, or interfering with or attempting to do one of these activities is prohibited.⁹⁵⁰ The habitats of an individual or populations of endangered or threatened species are also protected and no person is permitted to destroy, disturb, or interfere with or attempt to do one of these activities in their habitats.⁹⁵¹ Hence, the activities, work, or

⁹⁴⁵ *ibid* s 12(1).

⁹⁴⁶ Endangered Species Act, SNS 1998, c 11 s 2(1).

⁹⁴⁷ *ibid* s 3(q).

⁹⁴⁸ Categorized List of Species at Risk, NS Reg 21/2015.

⁹⁴⁹ 'Species At Risk vs Nova Scotia | Nature Nova Scotia' (<https://naturens.ca/>) <<https://naturens.ca/projects/species-at-risk-vs-ns-lands-and-forestry/>> accessed 18 November 2024; 'Bancroft v. Nova Scotia (Lands and Forests)' 2020 NSSC 175.

⁹⁵⁰ Endangered Species Act (n 946) s 13(1)(a).

⁹⁵¹ *ibid* s 13(1)(c).

undertaking of OWE that may kill or disturb species at risk or destroy, disturb, or interfere with their habitats in the province of Nova Scotia are prohibited.

Nonetheless, the Minister of Natural Resources has the authority to issue permits for certain activities such as “scientific purposes” and “the protection of human health or safety”.⁹⁵² Subsection 14 does not, however, confer any authority to the Minister to issue permits for human activities that may kill or disturb species at risk. Nor does it grant such an authority to the Minister to destroy or disturb their habitats either. Therefore, when there is no room for any authorization, the site of OWE is not allowed to be located in any marine areas that cause harm to species at risk under this Act and their habitats. Such limitations in issuing permits put the habitats of species at risk as excluded areas when planning is made for OWE.

3.2.2.4 Crown Lands Act

The use of provincial lands for developing some parts of OWE is regulated under the Crown Lands Act. Those parts of the OWE project such as laying cables, storage, transmission facilities, and other connections between offshore and onshore areas of OWE fall within the provincial lands of Nova Scotia. Allocation and use of land for these activities must be sustainable and regulated under the Crown Lands Act, which creates a regulatory framework to ensure the sustainable use and management of provincial lands.⁹⁵³ The power to control and administer the Nova Scotian lands acquired based on this Act and their sustainability is granted to the Minister of Lands and Forestry⁹⁵⁴ (now, the Minister of Natural Resources and Renewables). This power is exercised when the Minister

⁹⁵² *ibid* s 14(1)(a) & (b).

⁹⁵³ Crown Lands Act, RSNS 1989, c 114, s 2.

⁹⁵⁴ *ibid* s 9.

is going to issue a lease or license with respect to the Crown lands or any interest in the Crown lands for the development activities of OWE.⁹⁵⁵

When a license or lease is going to be issued for the development of OWE, considering any conflict with other special areas might also become critical. For example, special areas might be set aside by the Minister of Natural Resources and Renewables.⁹⁵⁶ These areas may be designated for different purposes. Section 24 of this Act identifies the purpose that special areas are designated and must be considered as exclusion areas when the development of OWE is authorized. This Section states:

The Minister may set aside special areas on the Crown lands for (a) the maintenance and management of the forests in conformity with the Forests Act and the Forest Enhancement Act; (b) the conduct of forest research; (c) the protection and regulation of the flow of water within the lands so reserved and set apart; (d) the development of water power to be derived therefrom; (e) the protection, management and conservation of wildlife and wildlife habitats; (f) such purposes as the Minister deems expedient.⁹⁵⁷

Issuing a lease or license for the development of OWE might become more complicated when this development affects the wildlife and wildlife habitats on the Crown lands. This development could create conflicts with other management and protective measures that may be adopted to maintain ‘long-term productivity, diversity and stability of the forest ecosystem’ or to ‘respect the integrity of water-supply watersheds, wildlife habitats, special places, ecological reserves, and significant outdoor-recreation opportunities’.⁹⁵⁸ Some examples of wildlife in Nova Scotia that might be related to OWE

⁹⁵⁵ *ibid* s 16(1)(a).

⁹⁵⁶ *ibid* s 24.

⁹⁵⁷ *ibid*.

⁹⁵⁸ *ibid* s 25.

include little brown bats, humpback whales, river otters, and harbour seals.⁹⁵⁹ Considering the conflicts between the OWE project and other activities and the environment is key in the contextualized sustainability of this sector.

3.2.3 Indigenous Peoples' Rights

Ecological sustainability as a theoretical framework of this thesis creates a connection between these rights and Indigenous worldviews, particularly those rooted in ecocentrism, believing that nature and natural entities possess intrinsic value. The basis of ecological sustainability in this sense strategically overlaps and is align with ideas found in Indigenous philosophies.⁹⁶⁰ This linkage also reflects Indigenous understandings of the interconnectedness of life. Hence, acknowledging ecological sustainability as a core concept in the Western legal frameworks reinforces Indigenous peoples' rights by recognizing nature's intrinsic rights.

However, critics argue that the close association between ecocentrism and ecocentrism and Indigenous philosophies may overlook the complexities of Indigenous legal systems and knowledge.⁹⁶¹ While ecocentrism acknowledges Indigenous worldviews, it is often critiqued for being influenced by Western thought, which risks undermining Indigenous leadership in these discussions.⁹⁶² The tendency to view Indigenous relationships with nature as ecologically harmonious can be problematic, as it may

⁹⁵⁹ 'Wildlife & Birds of Nova Scotia | Novascotia.Ca' <<https://novascotia.ca/natr/wildlife/wns/wns7f.asp>> accessed 27 June 2024.

⁹⁶⁰ Mihnea Tănăsescu, 'Rights of Nature, Legal Personality, and Indigenous Philosophies' (2020) 9 *Transnational Environmental Law* 429.

⁹⁶¹ Jérémie Gilbert, 'The Rights of Nature, Indigenous Peoples and International Human Rights Law: From Dichotomies to Synergies' 403 <<https://www.elgaronline.com/view/journals/jhre/13/2/article-p399.xml>> accessed 21 February 2025.

⁹⁶² *ibid.*

perpetuate stereotypes of Indigenous peoples.⁹⁶³ Such idealized narratives may have this repercussion that Indigenous laws and worldviews are appropriated without genuine integration or respect for their thoughts and values.⁹⁶⁴ Hence, more nuanced and context-sensitive approaches so that views of Indigenous peoples are not oversimplified as custodians of nature.

While the discussion over Indigenous peoples' rights is not within the scope of this thesis research, a sustainable future for OWE is not conceivable without considering their rights in the legislative and decision-making processes related to OWE. Hence, this topic is an area that requires further attention from scholars who have knowledge and expertise, although this thesis tries to trigger a relevant discussion in this subsection.

The development of OWE potentially creates issues between Indigenous peoples, authorities exercising jurisdiction and application of laws and regulations, and OWE developers. Firstly, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) recognizes free, prior, and informed consent when any development has impacts on Indigenous Peoples' rights and lives. Under the Act Respecting the United Nations Declaration on the Rights of Indigenous Peoples:

The Government of Canada must, in consultation and cooperation with Indigenous peoples, take all measures to ensure that the laws of Canada are consistent with the Declaration.⁹⁶⁵

Secondly, Article 32.1 states:

⁹⁶³ *ibid.*

⁹⁶⁴ Tănăsescu (n 960).

⁹⁶⁵ United Nations Declaration on the Rights of Indigenous Peoples Act, SC 2021, c 14 s 5.

States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.⁹⁶⁶

Thirdly, the duty to consult in the legislative process is recognized in *Mikisew Cree First Nation v Canada (Governor General in Council)*.⁹⁶⁷ The Supreme Court of Canada considered whether the Crown had a duty to consult Indigenous peoples when passing environmental legislation that could affect treaty and/or Aboriginal rights. This case allowed the Court to address the relationship between s 35(1) rights and the broader constitutional separation of powers and parliamentary sovereignty. In four separate opinions, the Court ultimately found that the development, passage, and enactment of legislation do not trigger the duty to consult. The judges disagreed, however, about the extent to which courts could ever review or restrict Parliament's power to pass legislation (which is different from reviewing the content of legislation after it has been passed). Generally, *Mikisew* holds that the duty to consult does not bind Parliament.

However, recent legislative actions have potentially modified the practical effect of the *Mikisew* ruling because it seems that the government of Canada has committed itself to consulting and cooperating with Indigenous peoples before the adoption of legislative measures that have potential effects on them.⁹⁶⁸

⁹⁶⁶ *ibid* s 32.1.

⁹⁶⁷ *Mikisew Cree First Nation v Canada (Governor General in Council)* 2018 SCC 40.

⁹⁶⁸ Mathen and Macklem (n 510) 639.

Finally, while *R v Sparrow* is not about OWE, it is important as it provides guidance on how a conflict between the development of OWE, legislating and exercising environmental laws, and the rights of Indigenous peoples would be resolved. This case involved an Indian who was convicted under the Fisheries Act for fishing with a drift net longer than permitted under the license and appealed on the basis that the license restriction was not consistent with subsection 35(1) of the Constitution Act, 1982 and he exercised his right based on the aboriginal right to fish. The Supreme Court of Canada held that subsection 35(1) of the Constitution Act, 1982 applies to “rights in existence” at the time when this Act came into effect and it does not revive extinguished rights, however, the burden of proof is on the Crown to demonstrate that the right is extinguished.⁹⁶⁹ The Fisheries Act and the permits under this Act are regulatory and controlling arrangements, which neither extinguish Aboriginal rights nor define the scope and content of Indian right to fish. The Court highlighted that ‘Government policy can, however, regulate the exercise of that right but such regulation must be in keeping with s. 35(1)’.⁹⁷⁰ The Court further added subsection 35(1) should be interpreted in a purposive and liberal manner, but laws or regulations that affect aboriginal rights should not be interpreted as the automatic ineffectiveness of those laws or regulations. They are valid laws and regulations if they meet ‘the test for justifying an interference with a right recognized and affirmed under section 35(1)’.⁹⁷¹

In the Court’s view, justifying an interference must have the following characteristics:

⁹⁶⁹ *R v Sparrow*, 1990 CanLII 104 (SCC), [1990] 1 SCR 1075.

⁹⁷⁰ *ibid.*

⁹⁷¹ *ibid.*

i) “[R]ecognition and affirmation” of aboriginal rights under section 35(1) make the government responsible to “act in a fiduciary capacity” and reconciliation must be achieved between this duty and aboriginal rights and in case of breach of such rights, justification should be demanded;

(ii) No immunization from legislation is provided under subsection 35(1), but “a substantive promise” with the wording of “recognition and affirmation” is given with the effect that if there are any negative consequences from legislation on aboriginal rights, the government must justify such effects;

(iii) When any negative effects of legislation on aboriginal rights are at issue, such rights should be understood from an aboriginal view, while being cognizant that common law concepts of property cannot be applied or translated into aboriginal rights such as fishing rights;

(iv) To understand a *prima facie* infringement of subsection 35(1), some criteria should be applied, including the reasonableness of limitation caused by the legislation, denial of right-holders from their preferred exercising means to use the rights unnecessarily, and proving the challenges by those individuals or groups who claim them;

(v) In case of a *prima facie* infringement, justification of legislation should be assessed by evaluating the validity of legislative objectives (e.g., conservation or resource management). If there is a valid objective, the justification of the restrictive legislation should then be examined considering the trust relationship between the Crown and aboriginal people (e.g., giving priority to aboriginal people over other users after conservation measures objective);

(vi) Other non-exhaustive factors should also be considered including the magnitude of infringement for achieving the objectives of the legislation, availability of fair compensation in case of expropriation, and consultation about the conservation measures (the objective of legislation) with aboriginal people.⁹⁷²

Considering these characteristics in the context of the development of OWE, and the application and exercise of the current laws and regulations are important in respecting Indigenous peoples' rights.

3.3 Conclusion

Canadian laws and policies do not coherently recognize ecological sustainability. Prohibiting any harm to ecological integrity is not a core principle in the law. This fundamental principle should be widely applied in the law to maintain the natural structure, composition, function, and processes of ecosystems. The Oceans Act is where ecological integrity is defined to provide a basis for establishing marine protected areas.⁹⁷³ In addition, various principles, approaches, and tools that support ecological sustainability have been reinforced by Canadian laws and policies. The precautionary principle, ecosystem approach, integrated management, and sustainable development have been emphasized in the law, particularly under the Oceans Act and related strategies, policies, and plans. While the recognition of ecological integrity along with other principles and approaches is inspiring, maintaining the integrity requires further expansion in the law to protect ecosystems against the likely adverse effects of human activities such as OWE.

⁹⁷² *ibid.*

⁹⁷³ Oceans Act (n 246) ss 35(1) and 35(1.1).

In addition, the fragmentation of laws and policies creates patchy governance for regulating OWE. Laws and policies should be reviewed separately to examine their effectiveness. After an extensive and detailed review of key federal and provincial laws and policies, some gaps, uncertainties, and weaknesses are identified. The tables below can provide a high-level summary of this review.

The fragmentation of laws and policies surrounding OWE results in inconsistent governance and regulatory challenges. A comprehensive evaluation of these laws and policies was essential to assess their effectiveness and identify areas for improvement. This entailed a meticulous examination of key federal and provincial regulations, as well as relevant policy frameworks, to uncover issues such as legal gaps, ambiguities, and systemic weaknesses. To facilitate a clearer understanding of these complexities, the accompanying tables provide a structured summary of the critical findings from this extensive review. This table outlines specific laws and policies, highlights their respective weaknesses, and pinpoints areas that require urgent attention. By addressing these identified deficiencies, policymakers can create a more cohesive and effective regulatory environment that supports the sustainable development of OWE.

Table 1- Key Federal Laws and Policies, Applications, and Uncertainties

Acts, Regulations, or Policies	Applications	Gaps/Uncertainties/Weaknesses
The Constitution Act, 1867	Division of powers over the development of OWE and related environmental impacts	Uncertainties from overlapping jurisdictions for law-making and exploitation right of developing OWE and regulating its environmental impacts

The 2024 Act	Seabed permitting	Lack of clarity or gaps in the following areas: approvals, impact assessment procedures, provincial-federal interactions, cumulative effects, and procedures to create plans, guidelines and regulations for OWE
Oceans Act, 1996, and its related policies and plans	DFO's responsibility to develop and implement marine plans, design integrated plans of oceans and sectoral plans for OWE, and avoid OWE activities in marine protected areas or their networks/buffer zones	Lack of a binding process for MSP, lack of actionable targets and procedures for integration under policies related to MSP, overlapping and inconsistent statutory mandates regarding marine protected areas, diversity of authorities and marine uses, and difficulties in communication
Fisheries Act, 1985, and related regulations and policies	Permitting and regulating OWE activities and their likely impacts on fish and fish habitat	Gaps to include suspension of seabed sediment contaminants, and gaps in the Marine Mammal Regulations and the Fish and Fish Habitat Protection Policy Statement to include the effects of OWE activities
Species at Risk Act, 2002	Permitting and regulating OWE activities and their likely impacts on listed species, and their habitats and residences	Lack of timelines for the listing process of species at risk, identification of critical habitats, and action plans
Migratory Birds Convention Act, 1994, and related regulations	Permitting and regulating OWE activities and their likely impacts on migratory birds	Uncertainties concerning the extent of protection under the Migratory Bird Sanctuary Regulations

Canadian Environmental Protection Act, 1999	Permitting the disposal of a substance in an area of the sea (e.g. ocean dumping)	Lack of guidelines, regulations, and standards with respect to the cutting and waste of materials during the construction phase, noise during the construction and operation phases, and electromagnetic fields from cables
Canadian Navigable Waters Act, 1985, and related regulations	Permitting OWE activities affecting the safety of navigation	Major Works Order does not include OWE structures.
Impact Assessment Act, 2019, and related regulations	Assessing the impacts of OWE projects that have 10 or more turbines	Lack of details/criteria for mainstreaming biodiversity in assessing the impacts of OWE
Canadian Energy Regulator Act, 2019, and related regulations	Permitting any work or activity related to OWE in offshore areas (excluding offshore areas under the 2024 Act)	Lack of comprehensive regulatory framework for offshore renewable energy, and lack of adequate liability mechanisms for cases of operators' non-compliance with the proposed Regulations and obligations under the EPP
Canada Shipping Act, 2001	Strict liability on ship owners for damaging the marine environment by oil pollution or garbage discharges from ships	Lack of requirement for the precautionary principle and its application through a reverse listing
Canada's Oceans Protection Plan, 2016	Establishing a fund for response and clean-up of oil pollution	Lack of coverage to apply to pollution from OWE, including pollution from waste, noise, and electromagnetic fields.
Canada's Federal Marine Protected Areas Strategy, 2005	A strategic foundation for decision-making on establishing marine protected areas and their network under various statutes	Uncertainties around the extent of protection/prohibiting activities within marine

		protected areas and their network
Federal Marine Protected Areas: Protection Standard, 2023	Banning new oil and gas and mineral activities to be located within the marine protected areas	Lack of coverage to apply to OWE activities
Canada's Ocean Noise Strategy, 2024, and the Statement for the Mitigation of Seismic Sound in the Marine Environment, 2004	Setting objectives and recommendations to minimize the impact of ocean noise on marine life	Inadequate to create legal obligations or thresholds to prevent or reduce the impacts of noise on marine life
Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada, 2024	Maintaining biodiversity goals, including protection of land and waters and bringing the loss of areas of high biodiversity importance close to zero	-

Table 2- Key Laws and Regulations of the Province of Nova Scotia, Applications, and Uncertainties

Act, Regulation, or Policy	Application/Requirements	Weakness/Gap/Uncertainty
Environment Act, 1994-95	Undertaking environmental assessment and permitting for OWE activities	Uncertainties about the classification of OWE and required approvals under the regulations
Marine Renewable-energy Act, 2015	Establishing priority areas for marine renewable energy	Lack of priority areas for OWE
Endangered Species Act, 1998	Limitation for OWE activities that may have conflict with species at risk and their habitats	Failure to identify, assess, adopt recovery plans, and provide review reports
Crown Lands Act, 1989	Permitting for OWE projects such as laying cables, storage, and transmission facilities	-

CHAPTER FOUR- INTERNATIONAL LAW AND POLICY COORDINATES FOR SUSTAINABLE DEVELOPMENT OF OFFSHORE WIND ENERGY

This section examines key international conventions to discern the obligations and recommendations that can be applied in the planning and development process of OWE in Canada. It is important to note that while Canada is not a party to all conventions or international agreements under review, this analysis aims to pinpoint the primary regulatory challenges associated with OWE development and explore the regulatory measures agreed between states. These measures are equally vital for Canada to mitigate conflicts in marine areas and safeguard the health of the marine environment.

This section will commence by examining global conventions pertaining to jurisdictional possibilities and limitations in marine areas while elucidating the overarching commitments for GHG reduction. Subsequently, an analysis of multilateral environmental agreements will be conducted to delineate the principal regulatory approaches and measures aimed at preserving biodiversity and protecting migratory species. This will be followed by a reflection on regional agreements and a stark and informative example from regional sea agreements, focusing on the specific protective measures that can be implemented in response to the impact of OWE on whales, water birds, and bats. Moreover, the discussion will encompass international soft law documents, delineating the guiding principles and norms within the realm of international law. Lastly, we will delve into the rules and standards established by international organizations to ascertain the potential support or limitations applicable to the development of OWE.

4.1 Global Conventions

4.1.1 The United Nations Convention on the Law of the Sea

A review of the legal regime of marine areas applicable to OWE under the United Nations Convention on the Law of the Sea (UNCLOS)⁹⁷⁴, which was ratified by Canada in 2003⁹⁷⁵, is important. Reviewing the relevant provisions of territorial seas, EEZ, and continental shelf clarifies the international rights of Canada related to permitting the development of OWE and regulating its environmental impacts in these waters.⁹⁷⁶ Moreover, examining the relevant provisions of UNCLOS will be also useful because it will apply the rules with respect to the potential conflict between the development of OWE and other marine activities in different marine areas (e.g. shipping) as well as any potential effect that this development may have on the environment.

4.1.1.1 Internal Waters and the Right to Construct OWE

Canada has full sovereignty to construct OWE in internal waters such as some bays or historic waters where the wind is strong enough to produce energy. Internal waters are not part of territorial or high seas, but rather, are similar to land and are defined as the “landward side of the baseline of the territorial water”.⁹⁷⁷ Canada has sovereignty over internal waters and, in principle, this sovereignty is not subject to any other right such as

⁹⁷⁴ United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3.

⁹⁷⁵ Environment and Climate Change Canada, ‘Law of the Sea: United Nations Convention’ (20 February 2015) <<https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/law-sea-united-nations-convention.html>> accessed 25 November 2024.

⁹⁷⁶ The current common and commercial forms of OWE are located in territorial waters or in the EEZ, where the project is feasible from a technical and economic perspective. The remote locations will impose technical issues because the depth of the water should be shallow enough to allow the construction of OWE projects with fixed or floating foundations. In cases where the outer edge of the continental margin is beyond 200 nautical miles, the current technology related to OWE cannot harness the energy, at least in the foreseeable future. Furthermore, remote locations might involve higher economic costs and more environmental impacts.

⁹⁷⁷ United Nations Convention on the Law of the Sea (n 974) art 8(1).

the right of innocent passage except in very limited circumstances.⁹⁷⁸ Because Canada has sovereignty in internal waters, it can pass and enforce laws and regulations. It enjoys wide discretion on how to manage shipping and fisheries, as well as issuing permits for the development and exploitation of OWE.

4.1.1.2 The Territorial Sea and the Right of Innocent Passage and Canada's Authority in the Construction of OWE

Canada enjoys sovereignty over the territorial sea and its bed and subsoil, and it is entitled to develop OWE within this area, subject to the provisions of UNCLOS and other rules of international law.⁹⁷⁹ The territorial sea for every state has a breadth of a maximum of 12 nautical miles from the baseline, which is determined under UNCLOS.⁹⁸⁰ The territorial sea's outer limit is the line at a distance from the baseline, which is equal to the breadth of the territorial sea.⁹⁸¹ The normal baseline is "the low-water line along the coast".⁹⁸²

The sovereignty of Canada over a territorial sea is not absolute; rather, it is qualified under UNCLOS. Canada must respect the right of innocent passage. Ships of all States enjoy this right through the territorial seas.⁹⁸³ The purpose of this passage is to be able to navigate the territorial sea, for example, to traverse without entering internal waters or proceeding to or from internal waters.⁹⁸⁴ UNCLOS requires that the passage be "continuous

⁹⁷⁸ *ibid* art 2 (1). Please see Article 8(2) for exceptional circumstances of application of innocent passage where drawing a straight baseline encloses as internal waters which had been considered as territorial waters.

⁹⁷⁹ *ibid* art 2.

⁹⁸⁰ *ibid* art 3.

⁹⁸¹ *ibid* art 4.

⁹⁸² *ibid* art 5.

⁹⁸³ *ibid* art 17.

⁹⁸⁴ *ibid* art 18(1).

and expeditious”, however, it does allow stopping and anchoring but only if such acts are “ordinary incidental to navigation or are rendered necessary by force majeure or distress or to render assistance to persons, ships or aircraft in danger or distress”.⁹⁸⁵

The passage is innocent when it is “not prejudicial to the peace, good order or security of the coastal State”.⁹⁸⁶ The protection of security allows Canada to temporarily suspend innocent passage in a specific area.⁹⁸⁷ However, security cannot be interpreted widely to include energy security being supplied out of the development of OWE because the word “security” here only covers military purposes. The example of security in Article 25 of UNCLOS makes a reference to “weapons exercises”⁹⁸⁸, which reinforces a narrow interpretation of security.

Canada can, however, adopt laws and regulations on innocent passage to protect OWE facilities as well as OWE cables that are laid from OWE to transmit generated electricity to onshore facilities.⁹⁸⁹ Considering the potential interaction between shipping and other uses such as cables and pipelines, Article 21(1) of UNCLOS expressly allows Canada to adopt laws for navigation safety, marine traffic, and the protection of cables and pipelines. In addition, the conventions of the International Maritime Organization (IMO) apply to traffic and safety namely the International Convention for the Safety of Life at Sea (SOLAS, 1974, as amended)⁹⁹⁰ and the 1972 Convention on the International Regulations

⁹⁸⁵ *ibid* art 18(2).

⁹⁸⁶ *ibid* art 19(1).

⁹⁸⁷ *ibid* art 25(3).

⁹⁸⁸ C Le Lièvre and AM O’Hagan, ‘Legal Frameworks for Maritime Spatial Planning’ in Dimitra Kitsiou and Michael Karydis (eds), *Marine Spatial Planning: Methodologies, Environmental Issues and Current Trends* (Nova Science Publishers, Inc 2017) 45.

⁹⁸⁹ United Nations Convention on the Law of the Sea (n 974) art 21(1).

⁹⁹⁰ International Convention for the Safety of Life At Sea (adopted 1 November 1974, entered into force 25 May 1980) 1184 UNTS 3.

for Preventing Collisions at Sea (COLREG)⁹⁹¹. These conventions are regarded as generally accepted international rules and standards. Foreign ships that enjoy innocent passage are obliged to follow the laws and regulations of Canada and “all generally accepted international regulations relating to the prevention of collisions at sea”.⁹⁹²

Based on what has been discussed above, the following points should be considered when Canada legislates or makes policies about OWE. First, as stated above, the reference to generally accepted international regulations relating to the prevention of collisions at sea is interpreted as those set by the IMO in COLREG. In particular, as Canada has ratified the IMO conventions, the IMO’s regulations are regarded as Canada’s regulations and foreign ships must comply with them, regardless of whether or not the flag state has ratified the IMO conventions.⁹⁹³ Second, the words “other facilities or installations” in Article 21(1)(b) are interpreted as including OWE⁹⁹⁴ and Canada may clearly pass safety laws and regulations to protect OWE installations and facilities. Finally, the words “protection of cables” in Article 21(1)(C) authorize Canada to pass laws and regulations to protect cables laid from OWE to transmit the generated electricity to shore facilities.

4.1.1.3 The Right of Canada to Regulate the Passage of Ships for Construction of OWE

Canada must consider the currently established designated sea lanes and traffic separation schemes (TSS) when it plans to develop OWE in a location where it conflicts

⁹⁹¹ Convention on the International Regulations for Preventing Collisions at Sea 1972 (adopted 20 October 1972, entered into force 15 July 1977) 16 UNTS 1050.

⁹⁹² United Nations Convention on the Law of the Sea (n 974) art 21(4).

⁹⁹³ Frank Maes, ‘The International Legal Framework for Marine Spatial Planning’ (2008) 32 Marine Policy 800.

⁹⁹⁴ *ibid.*

with a shipping route.⁹⁹⁵ Otherwise, the possibility of amending designated lanes and TSS should be examined under the IMO conventions. UNCLOS and the IMO conventions have rules and procedures that are useful to examine because Canada must take both into account when designing the development of OWE in the territorial sea. Canada has the right to regulate navigation safety by requiring a foreign ship's innocent passage to navigate through designated sea lanes and TSS.⁹⁹⁶ It must "take into account" several issues when it designates sea lanes and prescribes TSS. It must consider "the recommendations of the competent international organization", "the channels customarily used for international navigation", "the special characteristics of particular ships and channels" and "the density of traffic".⁹⁹⁷ The competent international organization in this clause is the IMO. The relevant provisions for sea lanes are provided in the International Convention for the Safety of Life (SOLAS) regulation V/10, the IMO General Provisions on Ships' Routeing adopted by Resolution A.572(14)⁹⁹⁸, as amended⁹⁹⁹ and rules 1(d) and 10 of COLREG.¹⁰⁰⁰

Paragraph 3(10) of Resolution A.572(14) provides the details that limit Canada's right to adopt or amend a routeing system for the construction of OWE. Based on this regulation, it can be understood that Canada should make sure "as far as possible" that

⁹⁹⁵ See the Annual Notices to Mariners for details about Canadian Practices, including for TSS, Canadian Coast Guard, 'Annual Notices to Mariners' <<https://www.notmar.gc.ca/annual>> accessed 18 November 2024.

⁹⁹⁶ United Nations Convention on the Law of the Sea (n 974) art 22(1). In accordance with article 22(1), "[T]he coastal State may, where necessary having regard to the safety of navigation, require foreign ships exercising the right of innocent passage through its territorial sea to use such sea lanes and traffic separation schemes as it may designate or prescribe for the regulation of the passage of ships".

⁹⁹⁷ *ibid* art 22(3).

⁹⁹⁸ The IMO Resolution A.572(14) on General Provisions on Ships' Routeing 1985.

⁹⁹⁹ The IMO Resolution MSC.165(78) on Adoption of Amendments to the General Provisions on Ships' Routeing (Resolution A.572(14) 2004.

¹⁰⁰⁰ The Secretariat of IMO, 'Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization' 31 <<https://www.kuestenpatent-kroatien.at/LEG%20MISC%208-1.pdf>> accessed 1 November 2020.

OWE turbines are not positioned inside any adopted routing systems.¹⁰⁰¹ However, it can be understood that in the case of building permanent structures within TSS, the government should make the necessary amendment to the scheme and submit it to the IMO “for adoption”.¹⁰⁰² Therefore, if, for example, the studies show that there is a suitable site for the development of OWE located within TSS but the marine traffic can accommodate the development with some adjustments, the scheme can be amended and given to the IMO. It is worth mentioning that Canada should proceed with such an amendment using the procedure described above. In 2008, the UK was the first country to designate sea lanes or TSS in coordination with the IMO to ensure navigational safety around marine renewable energy installations between the coast of Cornwall and the Isles of Scilly.¹⁰⁰³ The Netherlands also designated TSS in 2008 to ensure the safety of navigation and renewable energy installations.¹⁰⁰⁴ Thus, Canada should proceed with the IMO’s procedure to adopt or amend TSS as the case requires to make the development of OWE compatible with TSS.

4.1.1.4 Exclusive Economic Zones and the Jurisdiction of Canada to Construct OWE

Canada has the sovereign right to extract energy from wind in its EEZ under UNCLOS and it has jurisdiction as provided in UNCLOS to regulate the installation of OWE in this zone.¹⁰⁰⁵ The EEZ is defined as an area that is “beyond and adjacent to the

¹⁰⁰¹ The IMO Resolution A.572(14) on General Provisions on Ships’ Routing (n 998) para 3(10).

¹⁰⁰² *ibid* para 3(11).

¹⁰⁰³ International Maritime Organization (IMO), ‘Routing of Ships, Ship Reporting and Related Matters, Amendments to the Traffic Separation Scheme Off Lands End, Between Long ships and Seven Stones,’ IMO Doc. NAV 54/3/5, 28 March 2008 cited in Montserrat Abad Castelos, ‘Marine Renewable Energies: Opportunities, Law, and Management’ (2014) 45 *Ocean Development & International Law* 226.

¹⁰⁰⁴ Address of the Secretary-General at the Opening of the Fifty-Eighth Session of the Sub-Committee on Safety of Navigation, 2 July 2012, cited in *ibid*.

¹⁰⁰⁵ Canada has affirmatively claimed jurisdiction to extract natural resources and exercise environmental powers under the Oceans Act. For more details, see chapter three of this thesis.

territorial sea”, and which has a breadth that extends up to 200 nautical miles from the baseline.¹⁰⁰⁶ Canada does not have sovereignty in the EEZ, but it does have “sovereign rights”.¹⁰⁰⁷ In other words, the scope of Canada’s sovereign right is not the same as territorial sovereignty because Canada has limited spatial jurisdiction and rights to the matters specified by UNCLOS.¹⁰⁰⁸ For example, it has the ‘sovereign rights for 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’.¹⁰⁰⁹

Canada also has jurisdiction as provided to establish, use, ‘authorize and regulate the construction, operation, and use of’ the “installations and structures”.¹⁰¹⁰ Furthermore, it has the right to exercise its exclusive jurisdiction on installations and structures of OWE by adopting “customs, fiscal, health, safety ... laws and regulations”.¹⁰¹¹

The construction of installations and structures of OWE must be notified. For safety and navigational safety purposes, Canada must provide notification of reasonable safety zones based on international standards, which shall be no more than 500 meters, unless otherwise permitted in accordance with the “generally accepted international standards” or “recommended by the competent international organization”.¹⁰¹² Under the IMO regulation, the creation of a safety zone of more than 500 meters for installations and

¹⁰⁰⁶ United Nations Convention on the Law of the Sea (n 974) arts 55 and 57.

¹⁰⁰⁷ *ibid* art 56.

¹⁰⁰⁸ Yoshifumi Tanaka, *The International Law of the Sea* (3rd edn, Cambridge University Press 2019) 154.

¹⁰⁰⁹ ‘United Nations Convention on the Law of the Sea’ (n 974) art 56(1)(a).

¹⁰¹⁰ *ibid* arts 56(1)(b)(i) and 60(1)(b).

¹⁰¹¹ *ibid* art 60(2).

¹⁰¹² *ibid* art 60(3),(4) & (5).

structures like OWE must be submitted to the IMO for adoption.¹⁰¹³ All ships must obey the safety zones and the “generally accepted international standards”, which are set for navigation close to OWE installations, structures, and safety zones.¹⁰¹⁴ UNCLOS does not permit the establishment of installations and structures and accompanying safety zones when they conflict with “the recognized sea lanes essential to international navigation”.¹⁰¹⁵ Canada’s rights and duties are restricted to its obligation to have “due regard to the rights and duties of other States” and its acts must be compatible with the provisions of UNCLOS.¹⁰¹⁶

The IMO’s Resolution No.671(16) on safety zones and the safety of navigation around offshore installations and structures, which is understood to include OWE, provides that IMO members should make early assessments on the potential conflicts that may arise between shipping traffic, exploration, and exploitation areas.¹⁰¹⁷ Canada should ensure that the exploitation of wind energy on the continental shelf and in the EEZ does not seriously obstruct sea approaches and shipping routes.¹⁰¹⁸ It should either establish safety zones for offshore installations or structures or establish and chart routing systems through the area.¹⁰¹⁹ It should also take necessary measures to ensure that ships do not enter or pass through safety zones unless specific authorization has been obtained.¹⁰²⁰ Ships are authorized to enter or remain in the safety zones to provide services to installations or

¹⁰¹³ Maes (n 993) 802.

¹⁰¹⁴ United Nations Convention on the Law of the Sea (n 974) art 60(6).

¹⁰¹⁵ *ibid* art 60(7).

¹⁰¹⁶ *ibid* 56(2).

¹⁰¹⁷ The IMO Resolution No. 671(16) on Safety Zones and Safety of Navigation Around Offshore Installations and Structures 1989 para 1(a).

¹⁰¹⁸ *ibid* para 1(b).

¹⁰¹⁹ *ibid* para 1(c).

¹⁰²⁰ *ibid* para 1(d).

structures of OWE, or for other emergencies such as saving a life or property or a force majeure.¹⁰²¹ Due coordination should be made with offshore installations or structures, associated vessel traffic services, and other vessels in the area by radio contact.¹⁰²² Flag states should take action against ships that violate the established safety zones and they should notify Canada of such violations so that further action can be taken.¹⁰²³

Canada also has the right to permit laying cables from wind turbines located in the EEZ to land at a power source. However, there might be other states which perform some activities within the EEZ. In accordance with Article 58(1) of UNCLOS, all states have the right to use their EEZ for purposes such as navigation, overflight, and the laying of cables and pipelines subject to the relevant provisions of UNCLOS.¹⁰²⁴ However, states must have “due regard to the rights and duties of the coastal State” (i.e. Canada) and follow the laws and regulations of Canada and other rules of international law to the extent that they are compatible with UNCLOS.¹⁰²⁵ For example, the ships navigating in the EEZ must respect the laws and regulations of Canada concerning marine pollution.¹⁰²⁶

While UNCLOS has provided clear examples of permitted marine activities in the EEZ, it envisioned some room where conflict may arise between Canada’s rights, including those related to the laying of OWE cables, and other states’ rights and jurisdiction in the EEZ, including fishing, shipping and laying cables and pipelines. Article 59 of UNCLOS provides:

¹⁰²¹ *ibid* para 1(e).

¹⁰²² *ibid* para 1(f).

¹⁰²³ *ibid* para 2.

¹⁰²⁴ United Nations Convention on the Law of the Sea (n 974) art 58(1).

¹⁰²⁵ *ibid* art 58(3).

¹⁰²⁶ Tanaka (n 1008) 159.

In cases where this Convention does not attribute rights or jurisdiction to the coastal State or other States within the exclusive economic zone, and a conflict arises between the interests of the coastal State and any other State or States, the conflict should be resolved on the basis of equity and in the light of all the relevant circumstances, taking into account the respective importance of the interests involved to the parties as well as to the international community as a whole.

This Article does not resolve a conflict in favour of the coastal state (i.e. Canada) or other state(s); conflicts must be settled on a case-by-case basis.¹⁰²⁷ However, Rothwell and Stephens suggest that a distinction should be made between unattributed economic and non-economic rights and jurisdictions in the EEZ. The former is, in principle, for coastal states and the latter for other states.¹⁰²⁸ As discussed earlier on the defined rights of coastal state under Article 56(1)(a) of UNCLOS, a coastal state has sovereign rights over “activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, current and winds” in the EEZ. Thus, it can be argued that Article 59 does not apply to the development of OWE in the EEZ and that laying cables is part of the necessary activities for the exploitation of this energy in the EEZ.

4.1.1.5 Continental Shelf and High Seas

The jurisdiction of Canada on the Atlantic coast exceeds 200 nautical miles from the baseline because the jurisdiction prolongs and extends over the continental margin (i.e.,

¹⁰²⁷ *ibid.*

¹⁰²⁸ Donald R Rothwell and Tim Stephens, *The International Law of the Sea* (Hart Publishing 2010) 87. The authors made reference to ‘Report of the Committee of Experts on Technical Questions Concerning the Territorial Sea’ reproduced in *Virginia Commentaries*, vol 2, 59-63. The examples made by the authors for unattributed non-economic rights are those related to the underwater cultural heritage such as shipwrecks, which are addressed by the UNESCO Convention on the Protection of Underwater Cultural heritage adopted in 2001 and entered into force in 2009 in which coastal states are the ‘Co-Ordinating States’ for protection of underwater cultural heritage in the EEZ and Continental shelves on behalf of the state parties.

shelf, slope, and rise) to the outer edge of the continental shelf.¹⁰²⁹ In cases when the continental shelf extends beyond the EEZ, Part VI of the UNCLOS does not provide any express permission for the production of energy from wind (and other types of energy)¹⁰³⁰ because the provisions of this Part are related to the exploitation of seabed and subsoil, and the waters beyond the EEZ do not belong to the coastal state, and they belong to the high seas.¹⁰³¹ This silence provides room for different interpretations.

In one view, coastal states have an exclusive right to produce energy from wind on the continental shelf¹⁰³² because Article 60 refers to Article 56, which includes the exclusive right of coastal states to exploit and produce energy from wind.¹⁰³³ Another interpretation is that coastal states' exclusive right is limited to their rights on the continental shelf (e.g. natural resources¹⁰³⁴) and high seas are open to all states and the freedom of the high seas exercises for both coastal states and land-locked states, including the freedom to construct installations permitted under international law and lay submarine cables, subject to Part VI of the UNCLOS.¹⁰³⁵ With respect to OWE on the Atlantic

¹⁰²⁹ Chircop and others (n 664) 312.

¹⁰³⁰ Using offshore wind technology is technically and economically challenging for development in remote marine areas from the coast.

¹⁰³¹ Olivia Woolley, 'Renewable Energy and the Law of the Sea.Pdf' in James Kraska and Young-Kil Park (eds), *Emerging Technology and the Law of the Sea* (Cambridge University Press 2022) 4–5 <<https://durham-repository.worktribe.com/output/1625401/renewable-energy-and-the-law-of-the-sea>> accessed 24 April 2024.

¹⁰³² It should be noted that fixed offshore wind turbines are connected to the seabed permanently. Floating offshore wind turbines are not directly attached to the seabed but moored in the seabed through anchors and mooring lines; See David Capotosto, 'Mooring Matters: Fixed vs. Floating Offshore Wind Turbines' (*DeepWater Buoyancy*, 25 July 2023) <<https://deepwaterbuoyancy.com/comparing-fixed-and-floating-offshore-wind-turbines/>> accessed 25 November 2024.

¹⁰³³ McDonald and VanderZwaag (n 95) 303.

¹⁰³⁴ Article 77.4 of the UNCLOS provides that 'The natural resources referred to in this Part consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.'

¹⁰³⁵ KN Scott, 'Tilting at Offshore Windmills: Regulating Wind Farm Development Within the Renewable Energy Zone' (2005) 18 *Journal of Environmental Law* 89, 96; Chircop and L'Esperance (n 466) 20–24.

continental shelf beyond 200 nautical miles, according to both interpretations, Canada does not require the consent of any state to authorize OWE, but according to the former interpretation, other states' production of wind energy requires Canada's consent and based on the latter interpretation, other states are free to construct OWE subject to Part VI of the UNCLOS.

With respect to the legal regime applicable to the construction of OWE foundations and cables on the continental shelf and high seas, the following points are particularly relevant:

- a) The exercise of the rights of Canada to authorize the construction of OWE over the continental shelf 'must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States as provided for' in the UNCLOS.¹⁰³⁶
- b) All states have the right to lay cables on the continental shelf and the coastal states may not impede this right unless the coastal state wants to exercise its right to explore the continental shelf, exploit its natural resources, or prevent, reduce, and control pollution from pipelines.¹⁰³⁷
- c) All states must have due regard to the existing cables on the continental shelf when they lay cables.¹⁰³⁸

¹⁰³⁶ United Nations Convention on the Law of the Sea (n 974) art 78.2.

¹⁰³⁷ *ibid* arts 79.1 and 79.2. In addition, in accordance with Article 79.3 of the UNCLOS, the delineation of the course for laying pipelines on the continental shelf is subject to the consent of the coastal state. However, this article does not include cables. This deliberate exclusion, which can be understood by comparison with other subsections of Article 79, means that such consent is not required. This interpretation does not mean there is absolute discretion in laying cables, but the right is constrained by other rights of the coastal state to regulate pollution from cables.

¹⁰³⁸ *ibid* art 79.5.

d) If there is an OWE project on the continental shelf beyond 200 nautical miles and the cables of the project enter the territory or territorial sea of Canada, Canada has the right to establish conditions for the cables.¹⁰³⁹

Finally, it should be noted that the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, 2023 has emphasized the use of three main tools: (i) Establishment of area-based management tools, including marine protected areas; (ii) EIAs; and (iii) SEAs.¹⁰⁴⁰ Although the objective of this agreement is not to address issues related to OWE development, the use of EIA and SEA under this Agreement reinforces the significance of these tools in promoting sustainability. Establishing area-based management tools, including marine protected areas, in Areas Beyond National Jurisdiction may also create limitations arising from conservation objectives for OWE if this technology is feasible to be developed in these Areas.

4.1.1.6 Protection of the Environment

Coastal states have obligations to protect and preserve the marine environment. Based on Article 192 of the UNCLOS, Canada has a broad duty to ‘protect and preserve the marine environment’.¹⁰⁴¹ According to the recent advisory opinion of the International Tribunal for Law of the Sea (ITLOS), the obligation to protect and preserve the marine environment offers a “broad scope” and contains “any type of harm or threat to the marine

¹⁰³⁹ *ibid* art 79.3.

¹⁰⁴⁰ Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (23) A/CONF.232/2023/4.

¹⁰⁴¹ United Nations Convention on the Law of the Sea (n 974) art 192.

environment”.¹⁰⁴² In addition, the obligations are related to prevention, reduction, and control of pollution in the marine environment by ‘using best practicable means at their disposal and in accordance with their capabilities’.¹⁰⁴³ The obligation to protect the marine environment from pollution includes pollution from the release of toxic, harmful, or noxious substances, from vessels, and from installations used for operation in the marine environment.¹⁰⁴⁴

It might be problematic whether some impacts of OWE such as noise and electromagnetic field are included in the definition of pollution. The word “pollution” in the definition of “pollution of the marine environment”¹⁰⁴⁵ does not include noise during construction or operation and electromagnetic fields from cables. It could be argued that they are a type of energy that, if introduced to the environment, causes pollution.¹⁰⁴⁶ The recognition of noise as a form of pollution creates responsibility for States to take all measures necessary to prevent, reduce, and control the introduction of noise into the marine environment, although this obligation of States is softened by the words “using for this purpose the best practicable means at their disposal and in accordance with their

¹⁰⁴² *Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law (Request for Advisory Opinion Submitted to the Tribunal)* (Advisory Opinion of 21 May 2024) ITLOS Reports 2024 151.

¹⁰⁴³ United Nations Convention on the Law of the Sea (n 974) arts 194.1, and 207-212.

¹⁰⁴⁴ *ibid* art 194.3.

¹⁰⁴⁵ In accordance with Article 1(4) of the UNCLOS, “pollution of the marine environment” means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.

¹⁰⁴⁶ Karen Scott, ‘International Regulation of Undersea Noise’ (2004) 53 *International and Comparative Law Quarterly* 292–294; Olivia Woolley, *Renewable Energy Law* (Hart Publishing 2023) 197; Jeremy Firestone and Christina Jarvis, ‘Response and Responsibility: Regulating Noise Pollution in the Marine Environment’ (2007) 10 *Journal of International Wildlife Law & Policy* 126; The CMS Conference of the Parties, ‘Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species’ (2017) UNEP/CMS/Resolution 12.14 1. This resolution recognizes, depending on source and intensity, human-induced marine noise is a form of pollution that contains energy and that may have adverse effects on marine life.

capabilities”.¹⁰⁴⁷ In addition, the obligations of states include prevention, reduction, and control of marine pollution of the marine environment from the use of technologies under their jurisdiction or control, and the introduction of alien or new species to a certain part of the marine environment, which may cause significant and harmful changes.¹⁰⁴⁸ Although the word “technologies” is not defined in the UNCLOS, this word is so general and it could include marine renewable energy such as OWE.¹⁰⁴⁹ Such an interpretation provides a basis for the regulation of the environmental impacts of OWE. If we accept this argument, the next step is to define a standard or an acceptable level of noise beyond which it is considered prohibited pollution.

The measures for the protection and preservation of the marine environment in Part XII of the UNCLOS also include the measures necessary for the protection and preservation of “rare or fragile ecosystems” and “the habitat of depleted, threatened or endangered species and other forms of marine life”.¹⁰⁵⁰ This provision does not provide any criteria for determining what measures are necessary and the word “necessary” should be interpreted based on its ordinary meaning and understood broadly to include those measures which make the achievement of the objectives of protection and preservation possible, including enactment and enforcement of laws and regulations and conducting assessments and monitoring.¹⁰⁵¹ In addition, UNCLOS does not identify a list of “depleted,

¹⁰⁴⁷ United Nations Convention on the Law of the Sea (n 974) art 194.1; Firestone and Jarvis (n 1046) 127.

¹⁰⁴⁸ United Nations Convention on the Law of the Sea (n 974) art 196.1.

¹⁰⁴⁹ Carlos Soria-Rodríguez, ‘The International Regulation for the Protection of the Environment in the Development of Marine Renewable Energy in the EU’ (2021) 30 *Review of European, Comparative & International Environmental Law* 49.

¹⁰⁵⁰ United Nations Convention on the Law of the Sea (n 974) art 194.5.

¹⁰⁵¹ *Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law* (Request for Advisory Opinion Submitted to the Tribunal) (n 1042) 134–135.

threatened or endangered species”. However, the Convention on International Trade in Endangered Species of Wild Fauna and Flora,¹⁰⁵² to which there is “near-universal adherence”, provides guidance in the interpretation of “depleted, threatened or endangered species” mentioned in article 194.5 of the UNCLOS through the classification of species in its appendices.¹⁰⁵³

The coastal state and other states for listed highly migratory species under the Convention must also cooperate through appropriate international organizations to ensure the conservation of such species within and beyond the EEZ.¹⁰⁵⁴ States must also cooperate to conserve marine mammals and work through the appropriate international organizations to conserve, manage, and study cetaceans.¹⁰⁵⁵ Such protective and management measures can also cover the protection of such species against the likely adverse effects of OWE.

UNCLOS also expressly provides for an obligation to undertake EIA. When a planned activity under the jurisdiction or control of a state creates reasonable ground that it might cause ‘substantial pollution of or significant and harmful changes to the marine environment’, that state must assess the potential effects of the activity on the marine environment.¹⁰⁵⁶ ITLOS has also confirmed states’ obligation to conduct EIA. For instance, ITLOS decided that the UK breached its obligations under Article 206 of the UNCLOS with respect to the MOX plant through failure to properly and fully assess the potential effects of the operation of the MOX plant on the marine environment of the Irish Sea and

¹⁰⁵² The Convention on International Trade in Endangered Species of Wild Fauna and Flora (adopted 3 March 1973, entered into force 1 July 1975) 993 UNTS 243.

¹⁰⁵³ *Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law* (Request for Advisory Opinion Submitted to the Tribunal) (n 1042) 135.

¹⁰⁵⁴ United Nations Convention on the Law of the Sea (n 974) art 64.

¹⁰⁵⁵ *ibid* art 65.

¹⁰⁵⁶ *ibid* art 206.

related international movements of radioactive materials.¹⁰⁵⁷ ITLOS also prescribed that Malaysia and Singapore must cooperate and enter into consultations to assess the risks or effects of Singapore's land reclamation.¹⁰⁵⁸ In addition, the Advisory Opinion of ITLOS, which extended the obligation of conducting impact assessment to the areas beyond national jurisdiction or to resources that are the common heritage of mankind, emphasized that 'the obligation to conduct an EIA is a direct obligation under the Convention and a general obligation under customary international law'.¹⁰⁵⁹

4.1.2 United Nations Framework Convention on Climate Change, Kyoto Protocol, and Paris Agreement

4.1.2.1 United Nations Framework Convention on Climate Change

OWE is one of the policy options and measures that Canada can permit and take to demonstrate its contribution to meeting the UNFCCC's objective and reducing GHG emissions under the UNFCCC. Canada is among the states that are committed to contributing to the objective of the Convention, which is to stabilize the concentration of GHG in the atmosphere, preventing the adverse effects of interference with the climate system.¹⁰⁶⁰ Under the UNFCCC, Canada is listed in Annex I, categorizing it among the countries that must reduce GHG emissions.

The essence of the obligation for Canada as a developed country is different from developing countries because the UNFCCC has divided the countries into two categories

¹⁰⁵⁷ The MOX Plant Case (*Ireland v. United Kingdom*) (Provisional Measures, Order of 3 December 2001) ITLOS Reports 2001 para 26(4) & 26(5).

¹⁰⁵⁸ *Case Concerning Land Reclamation by Singapore in and around the Straits of Johor (Malaysia v. Singapore)* (Provisional Measures, Order of 8 October 2003) ITLOS Reports 2003 para 106.1(b).

¹⁰⁵⁹ *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area* (Advisory Opinion of 1 February 2011) ITLOS Reports 2011 para 145.

¹⁰⁶⁰ The United Nations Framework Convention on Climate Change (n 85) art 2.

for GHG emission reduction.¹⁰⁶¹ As a result of this binary differentiation, developed countries, including Canada, should take the lead in combatting climate change.¹⁰⁶² They also must demonstrate that their policies and measures are adopted to take ‘the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention’.¹⁰⁶³ In addition, in accordance with Article 4(2)(a), Annex I parties are obliged to adopt policies and take measures to reduce GHG emissions, while non-Annex I parties are not obliged to take such actions.¹⁰⁶⁴

The development of OWE as a technology, that contributes to the reduction of GHG emissions, is also one of the options to fulfill obligations under the UNFCCC.¹⁰⁶⁵ Under the Convention, the parties must promote the development of technologies that reduce GHG emissions. The Convention, however, does not impose any obligations to select a specific type of technology like OWE and the parties have wide discretion to select various available technologies. In exercising their discretions, the parties can also consider ‘their common but differentiated responsibilities, their specific national and regional development priorities, objectives, and circumstances’.¹⁰⁶⁶ Such policy options and consideration of national circumstances offer flexibility for states to fulfill their commitments according to their choice.

¹⁰⁶¹ Annex I of the Convention is a list of developed countries (the members of the OECD (Organization for Economic Co-operation and Development) in 1992). Non-Annex I refer to other countries (i.e. developing countries) that are not listed in Annex I. This binary differentiation of obligations is called a firewall.

¹⁰⁶² The United Nations Framework Convention on Climate Change (n 85) art 3(1).

¹⁰⁶³ *ibid* art 4.2 (a).

¹⁰⁶⁴ *ibid* art 4.2 (a) and 4.2 (g).

¹⁰⁶⁵ *ibid* art 4.1(c).

¹⁰⁶⁶ *ibid* art 4.1.

From the UNFCCC’s perspective, it can be said that the development of OWE as a measure to mitigate the effects of climate change should be considered within other obligations under the Convention and the factual limitations. The UNFCCC provides a soft obligation to take measures that mitigate the adverse effects of climate change, while it also acknowledges that such measures for mitigation should be cost-effective to ensure “the global benefits at the lowest possible cost”.¹⁰⁶⁷ The measures should reflect the “socio-economic contexts” and be integrated with national development programs.¹⁰⁶⁸ The parties to the Convention in their policies and measures for protecting the climate system may also consider that “economic development is essential for adopting measures to address climate change”.¹⁰⁶⁹ Such other economic and social factors make the context more fluid for states to take discretionary approaches in mitigation measures.

4.1.2.2 Kyoto Protocol to the United Nations Framework Convention on Climate Change

Canada was a party to the Kyoto Protocol¹⁰⁷⁰, which divided states into developed and developing countries and used top-down, binding, and more specific reduction targets for developed states. According to this Protocol, Canada agreed that the emission of GHG must not exceed the amounts specified in Annex B of the Protocol so that it reduces GHG emissions by a specific percentage below 1990 levels from 2008 to 2012.¹⁰⁷¹ To achieve the quantified emission limitation and the reduction targets under the Protocol, Canada

¹⁰⁶⁷ *ibid* art 3.3.

¹⁰⁶⁸ *ibid* art 3.3 & 3.4.

¹⁰⁶⁹ *ibid* art 3.4.

¹⁰⁷⁰ The Kyoto Protocol to the United Nations Framework Convention on Climate Change (n 86).

¹⁰⁷¹ *ibid* art 3.1.

agreed to implement policies and measures to promote, develop, and increase the use of renewable energy (which includes OWE) among others.¹⁰⁷²

Canada, however, withdrew from the Kyoto Protocol in 2011 because, among others, it was concerned about its inability to comply with its obligation to cut GHG emissions under the Protocol and that other major emitters such as China and India did not have obligations to cut GHG emissions.¹⁰⁷³ Considering Canada's withdrawal, the only explicit legal link between the obligation to reduce GHG emissions and the obligation to develop renewable energy does not exist any longer.

Canada was not alone in considering the Kyoto Protocol unfair. The differentiation model in cutting GHG emissions was not considered fair by other developed countries as well. The unfair model in light of the emerging economies of China and India led to a reconsideration of the annex-based approach of the UNFCCC and the Kyoto Protocol.¹⁰⁷⁴ The idea of top-down and binding obligations as well as the bifurcation of countries for emission targets were reconsidered in the COPs in Durban, Doha, Warsaw, and finally Lima. The parties reached a new model of a bottom-up and inclusive approach. The Lima Call for Action invited the parties to communicate their nationally determined contributions (NDCs) towards achieving the objective of the Convention and to represent the progression beyond their current undertakings.¹⁰⁷⁵

¹⁰⁷² *ibid* art 2.1(a) (iv).

¹⁰⁷³ CBC News, 'Canada Pulls out of Kyoto Protocol | CBC News' (*CBC*, 12 December 2011) <<https://www.cbc.ca/news/politics/canada-pulls-out-of-kyoto-protocol-1.999072>> accessed 16 January 2024.

¹⁰⁷⁴ US and China announced in 2014 that they would reach an agreement in 2015 that reflects CBDR-RC, "in light of different national circumstances". See 'U.S.-China Joint Announcement on Climate Change' <<https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change>> accessed 19 October 2021.

¹⁰⁷⁵ The Conference of the Parties to the UNFCCC, 'Report of the Conference of the Parties on Its Twenty-First Session' (2016) FCCC/CP/2015/10/Add.1 paras 9 & 10.

4.1.2.3 Paris Agreement

The Paris Agreement, which aims at limiting the temperature “well below 2°C above pre-industrial levels” and striving to limit the temperature to 1.5°C¹⁰⁷⁶, does not have any explicit reference to renewable energy as a technology to reduce GHG emissions. Canada does not have any specific legal constraint on how to reduce GHG emissions, hence the reduction could be done through OWE, other types of renewable energy, and any other appropriate ways for reduction of GHG emissions. Considering the maturity of OWE as a technology, it can be used to reduce GHG emissions and achieve a balance between emissions and removals of GHG in the second half of the century.¹⁰⁷⁷

In achieving the Paris Agreement goal, Canada does not have reduction responsibilities, which were entrenched in the UNFCCC and the Kyoto Protocol. A more flexible and tailor-made approach is selected under the Paris Agreement.¹⁰⁷⁸ Canada needs to know how renewable energy (e.g. OWE) plays a role in performing its self-differentiated emission targets and the common but differentiated responsibilities. Nonetheless, the individual actions, in particular mitigation actions, of Canada (like any other party to the Paris Agreement) should be consistent with and adequate to achieve the goal of the Paris Agreement.¹⁰⁷⁹ Reaching this goal does not impose precise obligations of conduct. Canada has a non-binding obligation to take mitigation measures that are effective in reducing GHG emissions.

¹⁰⁷⁶ The Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) art 2.1.

¹⁰⁷⁷ *ibid* art 4.1.

¹⁰⁷⁸ Meinhard Doelle, ‘The Paris Agreement: Historic Breakthrough or High Stakes Experiment?’ (2016) 6 *Climate Law* 5.

¹⁰⁷⁹ *ibid* 8.

Considering the contribution of energy to GHG emissions and the role that OWE can play in reducing such emissions, Canada with vast offshore areas and good potential is among the developed countries that can have a leading role while considering and minimizing the environmental effects. Under the Paris Agreement, Canada is among the developed countries that “should continue taking the lead” by committing to “economy-wide absolute emission reduction targets”.¹⁰⁸⁰ In addition, Canada must pursue measures, which can be the development of OWE, to mitigate GHG emissions to achieve its NDCs. Article 4(2) of the Paris Agreement uses language, which is more than a voluntary commitment and less than a binding obligation.¹⁰⁸¹ This Article provides that “[P]arties shall pursue domestic mitigation measures, to achieve the objectives of such contributions”.¹⁰⁸² The first part of this Article is an obligation (an obligation of conduct¹⁰⁸³), which is similar to what Article 2 of the UNFCCC sets out¹⁰⁸⁴, and the second part, while makes a connection between the measures and the NDCs, is “an obligation to pursue measures in good faith”.¹⁰⁸⁵ The NDCs “will” also reflect the “highest possible

¹⁰⁸⁰ The Paris Agreement (n 1076) art 4.4.

¹⁰⁸¹ Daniel Bodansky, ‘The Paris Climate Change Agreement: A New Hope?’ (2016) 110 *American Journal of International Law* 304.

¹⁰⁸² The Paris Agreement (n 1076) art 4.2.

¹⁰⁸³ Lavanya Rajamani, ‘Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics’ (2016) 65 *International and Comparative Law Quarterly* 497.

¹⁰⁸⁴ Article 2 of the UNFCCC states that: “The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”

¹⁰⁸⁵ Bodansky (n 1081) 304.

ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”.¹⁰⁸⁶

Canada’s NDC, updated in 2021, sets emission reduction of at least 40-45% below 2005 levels by 2030. This NDC states that this target is ambitious because it has increased its reduction target compared to the initial NDC submitted in 2016.¹⁰⁸⁷ In addition, Canada aims to achieve net-zero emissions by 2050.¹⁰⁸⁸ Canada considers its updated NDC fair because it contains significant progression and the 2050 goal is also in line with the IPCC Special Report on Global Warming of 1.5°C.¹⁰⁸⁹ Canada’s NDC notes that around 82% of electricity is generated from renewable energy sources (wind, solar, and water) and nuclear.¹⁰⁹⁰ The NDC also states that it aims to reduce GHG emissions by decarbonizing other sectors such as transportation, and investing in smart renewable energy and grid modernization projects.¹⁰⁹¹ However, it seems that Canada should set a more ambitious target (e.g. at least a 54% emission reduction below 2005 levels by 2030) to be compatible with the 1.5°C pathway.¹⁰⁹² Some types of renewable energy/OWE which have become economic can be favorable in achieving more ambitious targets. It is notable that, unlike the Paris Agreement which does not have any provision concerning renewable energy, the recently agreed outcome of the first global stocktake under the Paris Agreement calls on

¹⁰⁸⁶ The Paris Agreement (n 1076) art 4.3.

¹⁰⁸⁷ ‘Canada’s 2021 Nationally Determined Contribution Under the Paris Agreement’ (2024) 1 & 12 <https://unfccc.int/sites/default/files/NDC/2022-06/Canada%27s%20Enhanced%20NDC%20Submission1_FINAL%20EN.pdf> accessed 18 January 2024.

¹⁰⁸⁸ *ibid.*

¹⁰⁸⁹ *ibid* 21 & 22.

¹⁰⁹⁰ *ibid* 4.

¹⁰⁹¹ *ibid.*

¹⁰⁹² ‘Canada’ (*Climate Action Tracker*) <<https://climateactiontracker.org/climate-target-update-tracker/canada/>> accessed 3 October 2021.

the parties to transition away from fossil fuels, accelerate renewable energy technologies, and triple renewable energy capacity globally by 2030.¹⁰⁹³

Finally, the Paris Agreement does not provide any connection between mitigation plans and their likely impacts on ecosystems. It only notes in the preamble of the Agreement ‘the importance of ensuring the integrity of all ecosystems, including oceans, and protection of biodiversity, recognized by some cultures as Mother Earth’¹⁰⁹⁴ The linkages between ecosystems and climate systems are mainly in the context of adaptation plans and actions. Such connections include (i) Adaptation and long-term global responses to climate change to protect ecosystems¹⁰⁹⁵; (ii) Considering ecosystems as a factor in adaptation actions¹⁰⁹⁶; (iii) Considering ecosystems in formulating nationally determined prioritized actions for adaptation¹⁰⁹⁷; and (iv) Supporting the resilience of ecosystems in the context of loss and damage related to climate change¹⁰⁹⁸. Therefore, the Paris Agreement does not guide how the conflict between the mitigation plans or actions such as OWE and their impacts on ecosystems can be addressed.

¹⁰⁹³ ‘Outcome of the First Global Stocktake’ (2023) cma5_auv_4_gst.pdf para 28 <https://unfccc.int/sites/default/files/resource/cma5_auv_4_gst.pdf> accessed 10 January 2024.

¹⁰⁹⁴ The Paris Agreement (n 1076) preamble.

¹⁰⁹⁵ *ibid* art 7.2.

¹⁰⁹⁶ *ibid* art 7.5.

¹⁰⁹⁷ *ibid* art 7.9(c).

¹⁰⁹⁸ *ibid* art 8.4 (h).

4.2 Multilateral Environmental Agreements

4.2.1 Convention on Biological Diversity

The Convention on Biological Diversity (CBD)¹⁰⁹⁹, which is a legally binding convention for Canada through ratification made in 1992¹¹⁰⁰, is very relevant to the context of the environmental impacts of OWE. As discussed in chapter two of this thesis, OWE has the potential to contribute to ecological changes, loss of species and their habitats, the introduction of invasive species, acoustic impacts on species, electromagnetic field effects on the navigation of species, and fragmentation of ecosystems by cables. Such environmental impacts trigger this question of how Canada should act to be consistent with its commitments under the CBD to maintain ecosystem resilience.

Starting with the requirements under CBD, the Parties must, “as far as possible and as appropriate”, regulate or manage biological resources, which are within or outside the protected areas, to ensure their conservation and sustainable use.¹¹⁰¹ The Parties must promote the protection of ecosystems, and natural habitats, and the maintenance of viable populations of species.¹¹⁰² The Parties must prevent the introduction of or control alien species which threaten ecosystems, habitats, or species.¹¹⁰³ Such obligations help to understand the overarching objectives that should be protected when the development of OWE is planned.

¹⁰⁹⁹ Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79.

¹¹⁰⁰ ‘List of Parties’ <<https://www.cbd.int/information/parties.shtml>> accessed 25 November 2024.

¹¹⁰¹ Convention on Biological Diversity (n 1099) art 8(c).

¹¹⁰² *ibid* art 8(d).

¹¹⁰³ *ibid* art 8(h).

The development of OWE must also be consistent with the objectives and commitments under the CBD. The Convention aims at conserving biological diversity and sustainable use of its components.¹¹⁰⁴ The general commitments under the CBD are set to ensure the consistency of the Parties' policies and plans with the objectives of the CBD. For instance, Canada must take appropriate measures "by its particular conditions and capabilities" to i) adapt existing strategies, plans, or programs or develop new ones for the conservation and sustainable use of biological diversity; and ii) integrate the conservation and sustainable use of biological diversity into plans, programs, and policies.¹¹⁰⁵ These obligations commit Canada to allow the development of OWE if such development does not jeopardize the objectives of the CBD and its policies, plans, and measures.

Being consistent with the objectives of the CBD and Canada's policies and plans is necessary but not sufficient. Canada must ensure that the impacts of OWE are identified, regulated, managed, and monitored properly. Under the CBD, there are commitments for biodiversity use that can be translated into OWE. Each Party must, "as far as possible and as appropriate", identify processes and categories of activities that have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity and monitor their effects through sampling and/or other techniques.¹¹⁰⁶ Using SEA and EIA are helpful tools for building strategies to decide about OWE and assessing its impacts. These tools inform the Parties to perform their commitments. For instance, the Parties should stop human activities that degrade or cause the loss of ecologically important ecosystems and habitats and prevent unsustainable human activities that have significant

¹¹⁰⁴ *ibid* art 1.

¹¹⁰⁵ *ibid* art 6.

¹¹⁰⁶ *ibid* art 7(c).

adverse effects on marine and coastal areas, particularly the ecologically or biologically significant areas.¹¹⁰⁷ To perform obligations and be informed of the impacts of projects, each Party to the CBD, “as far as possible and as appropriate”, must introduce procedures that require EIA of projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and cumulative effects on marine and coastal biodiversity.¹¹⁰⁸ The parties must introduce appropriate arrangements to ensure that the environmental consequences of its programs and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account.¹¹⁰⁹

Adopting an ecosystem approach is a fundamental approach that supports ecological sustainability. This approach, endorsed by the Conference of the Parties of the CBD, should be integrated into the development of OWE as it is with other marine uses such as aquaculture.¹¹¹⁰ The ecosystem approach is defined as ‘a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way’, which strikes a balance between the objectives of the Convention (i.e. sustainable use and the fair and equitable sharing of benefits).¹¹¹¹ Applying this approach is possible by being “all-inclusive” in terms of considering all scientific and traditional information as well as involving all social actors and disciplines.¹¹¹² The

¹¹⁰⁷ The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity’ (n 822) paras 72, 73.

¹¹⁰⁸ Convention on Biological Diversity (n 1099) art 14.1(a); The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity’ (n 822) paras 13(f),(h), 70.

¹¹⁰⁹ Convention on Biological Diversity (n 1099) art 14.1(b).

¹¹¹⁰ See, for example, FAO, *Aquaculture Development: 4.Ecosystem Approach to Aquaculture* (Food and Agriculture Organization of the United Nation 2010).

¹¹¹¹ The Conference of the Parties to the Convention on Biological Diversity, ‘The Ecosystem Approach’ (Secretariat of the Convention on Biological Diversity 2000) COP 5 Decision V/6 para 1 <<https://www.cbd.int/decision/cop/default.shtml?id=7148>> accessed 29 February 2024.

¹¹¹² *ibid* para 6, principles 11, 12.

ecosystem approach focuses on the application of scientific biological knowledge related to the structure, processes, functions, and interactions among organisms and their environment, and human is considered as an integral part of ecosystems.¹¹¹³ The Parties to the CBD should support initiatives that improve the collection and communication of data participation of stakeholders and effective engagement of Indigenous people and communities to manage and implement decisions.¹¹¹⁴

Knowledge concerning marine environment and uses is not, however, conclusive, and certain. For instance, OWE, which causes the loss of soft-bottom habitats and the creation of hard-bottom habitats, can be added to other changes to ecosystems and naturally occurring changes in the environment. Changes are inevitable because change in ecosystems is complex, dynamic, and constant in terms of species composition and population abundance. In addition, the application of the ecosystem approach may lead to uncertain outcomes due to the complexity, dynamic, and non-linear nature of ecosystems.¹¹¹⁵ For the application of this approach, adopting adaptive management is essential.¹¹¹⁶ “Learning by doing” is a tool in adaptive management to use research feedback for responding to the uncertainties.¹¹¹⁷ Adaptive management can be used to anticipate and adapt to ecosystem conditions and make decisions that mitigate the effects

¹¹¹³ *ibid* para 2.

¹¹¹⁴ The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biological Diversity: Enhancing the Implementation of Integrated Marine and Coastal Area Management’ (2006) COP 8 Decision VIII/22 para 6(a) <<https://www.cbd.int/doc/decisions/cop-08/cop-08-dec-22-en.pdf>> accessed 5 March 2024.

¹¹¹⁵ The Conference of the Parties to the Convention on Biological Diversity, ‘The Ecosystem Approach’ (n 1111) para 4.

¹¹¹⁶ *ibid*.

¹¹¹⁷ *ibid* paras 4 and 10.

of changes while being cautious that decisions do not prevent flexibility and using other available options.¹¹¹⁸

In addition, MSP is another recommended tool under the CBD's decisions. This tool helps the current area-based management initiatives related to marine integrated planning, marine protected areas, SEA, EIA, and management of other marine activities such as fisheries, and tourism.¹¹¹⁹ The Intergovernmental Oceanographic Commission defines MSP as 'a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process'.¹¹²⁰ According to another definition, 'MSP is a practical way to organize the use of the ocean space, and the interactions among human uses (e.g., fisheries, aquaculture, shipping, tourism, renewable energy production, marine mining) and between uses and the marine environment. MSP is a continuous and interactive process that should be regularly funded and adapted, planning cycle after planning cycle, and one that requires the engagement of multiple actors and stakeholders at various governmental and societal levels due to its public nature'.¹¹²¹

MSP has benefits. It is a framework that can improve the decision-making process to manage conflicts that may arise over marine use and the effects of human activities on the marine environment.¹¹²² It is a social, economic, and ecological choice of how OWE

¹¹¹⁸ *ibid* para 6, principle 9.

¹¹¹⁹ Conference of the Parties to the Convention on Biological Diversity, 'Marine Spatial Planning and Training Initiatives' (2016) COP 13 Decision XIII/9 para 3(c) <<https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-09-en.pdf>> accessed 5 March 2024.

¹¹²⁰ Douvere and Ehler (n 64) 18.

¹¹²¹ Catarina Frazão Santos and others, 'Marine Spatial Planning', *World Seas: an Environmental Evaluation* (Elsevier 2019) 571; The last part of the quotation is from Erik Olsen and others, 'Integration at the Round Table: Marine Spatial Planning in Multi-Stakeholder Settings' (2014) 9 PLoS ONE e109964, 1.

¹¹²² Fanny Douvere and others, 'The Role of Marine Spatial Planning in Sea Use Management: The Belgian Case' (2007) 31 *Marine Policy* 185.

might be embedded in MSP. It is a social and economic choice because stakeholders and the public are involved in providing their opinions in the decision-making process. It is also an ecological choice because MSP should help the inclusion of biodiversity and how the likely conflict between OWE and biodiversity is resolved. MSP is “a participatory tool to facilitate the application of the ecosystem approach” and it should help mainstream biodiversity in policies that are related to development activities.¹¹²³ In any event, if a society decides to include OWE in a plan, it must analyze the available data related to the current status of marine activities, locate suitable spaces for OWE, assess its interaction with other marine uses and the potential conflicts and impacts on other uses and the environment. The allocation of space for OWE is not permanent and the plan might be revised from time to time based on new data, information, and objectives.

Finally, the commitments under the CBD are not, however, absolute and are subject to discretion. The CBD uses different wordings such as “as far as possible or as appropriate”, and national capabilities, which are significant qualifiers.¹¹²⁴ One of the reasons for being reluctant to commit to absolute obligation is that states do not want to curb their freedom regarding the exploitation of natural resources. This customary international law principle is also recognized in the CBD, which provides that states have sovereign rights over their natural resources, and they can develop and exploit those resources based on their environmental policies.¹¹²⁵ The qualifiers limiting obligations by vague wordings offer uncertainties and ambiguities, which hinder the effectiveness of the

¹¹²³ Conference of the Parties to the Convention on Biological Diversity, ‘Marine Spatial Planning and Training Initiatives’ (n 1119) para 2.

¹¹²⁴ Michelle Lim, ‘Biodiversity 2050: Can the Convention on Biological Diversity Deliver a World Living in Harmony with Nature?’ (2021) 30 Yearbook of International Environmental Law 79, 89.

¹¹²⁵ Convention on Biological Diversity (n 1099) art 3.

Convention in satisfying its objectives. Such limitations provide wide discretion to the Parties of the CBD and impose limited commitments in a way that some authors have considered the Convention as aspirational and a “framework convention”.¹¹²⁶

4.2.1.1 Consistency with Kunming-Montreal Global Biodiversity Framework

The soft obligations of the Parties under the Convention have been, in practice, aligned with the recognition of targets to make the Convention more operational at the implementation stage. The most recent target-based approach by the Conference of the Parties led to the adoption of the Kunming-Montreal Global Biodiversity Framework. This Framework has adopted an action-based and result-oriented approach, which guides policies, strategies, and targets, to stimulate transformative actions by governments and achieve the objectives of the Convention and the Convention’s vision of living in harmony with nature by 2050.¹¹²⁷ The vision and goals of the Framework for 2050 are (i) Valuing, conserving, and restoring biodiversity, (ii) Maintaining its resilience, integrity, connectivity, services, and benefits, and (iii) Using it wisely.¹¹²⁸ The mission of the Convention is to take urgent actions to halt and reverse biodiversity loss and conserve and sustainably use biodiversity.¹¹²⁹ The Framework recognizes the various approaches such as the human rights-based approach, which includes the human right to a clean, healthy, and sustainable environment, as well as the rights of nature and the rights of Mother Earth,

¹¹²⁶ Stuart R Harrop and Diana J Pritchard, ‘A Hard Instrument Goes Soft: The Implications of the Convention on Biological Diversity’s Current Trajectory’ (2011) 21 *Global Environmental Change* 476.

¹¹²⁷ Conference of the Parties to the Convention on Biological Diversity, ‘Kunming-Montreal Global Biodiversity Framework’ (2022) COP 15 Decision 15/4 paras 4, 5, 9 of the Annex <<https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>> accessed 3 May 2024.

¹¹²⁸ *ibid* paras 10, 12 of the Annex.

¹¹²⁹ *ibid* para 11 of the Annex.

which are acknowledged by some countries.¹¹³⁰ Such long-term targets, missions, and visions are supported by more specific medium-term and operational targets that can be connected to the context of OWE.

The Framework urges the implementation of a series of action-oriented targets, needing to be completed by 2030, which can help set a regulatory context where OWE nests. For example, the Framework’s targets for 2030, among others, are to ensure: (i) A “participatory, integrated and biodiversity inclusive spatial planning and/or effective management processes”, which cover all areas, to reduce the loss of areas of high biodiversity importance (e.g. ecosystems of high ecological integrity) close to zero; (ii) Restoring at least 30 per cent of the degraded marine and coastal ecosystems; (iii) Conservation and management of at least 30 per cent of terrestrial and water areas through area-based conservation measures such as ecologically representative protected areas; (iv) Reduction of the impacts of invasive alien species on biodiversity and ecosystems services through prevention of their introduction by at least 50 per cent; (v) Reduction of pollution risk and its impacts to prevent harming biodiversity and ecosystem functions and services; and (vi) Minimizing the impacts of climate change through mitigation and adaptation actions “while minimizing negative and fostering positive impacts of climate actions on biodiversity”.¹¹³¹

The development of OWE might be considered an obstacle for some of these targets and a driver for change for others when regional or local decisions are made to make the Framework operational. For example, OWE may cause a conflict with the targets for

¹¹³⁰ *ibid* paras 7(b), 7(g) of the Annex.

¹¹³¹ *ibid* para 11 of the Annex, targets 1, 2, 3, 6, 8.

conservation areas and the target of their future expansion. OWE may also introduce and facilitate the movement of invasive species, which contrasts with the prevention target intended by the framework. Nonetheless, OWE can catalyze the adoption of spatial planning in which all stakeholders are involved to create a more inclusive plan with the least impact on users and the environment. Resolving these conflicting objectives should be favourable to and aligned with ecological sustainability and achieving environmental targets.

4.2.1.2 The COP's Guidelines on SEA and EIA

The Conference of the Parties has adopted voluntary guidelines for the parties to note in their national legislation, and for their regional authorities to follow in the development and implementation of impact assessments.¹¹³² The guidelines can be applied in the context of implementing paragraph 1 (a) of Article 14 of the Convention and the relevant targets under the convention.¹¹³³ The annex of the guidelines provides good practices for procedural steps in the EIA process so that biodiversity-related considerations are integrated into the different stages of this process.¹¹³⁴

¹¹³² The Conference of the Parties to the Convention on Biological Diversity, 'Impact Assessment: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment' (Secretariat of the Convention on Biological Diversity 2006) COP 8 Decision VIII/28 para 4 <<https://www.cbd.int/decision/cop/default.shtml?id=11042>> accessed 1 March 2024; The Conference of the Parties to the Convention on Biological Diversity, 'Marine and Coastal Biodiversity: Sustainable Fisheries and Addressing Adverse Impacts of Human Activities, Voluntary Guidelines for Environmental Assessment, and Marine Spatial Planning' (2012) UNEP/CBD/COP/DEC/XI/18 <<https://www.cbd.int/doc/decisions/cop-11/cop-11-dec-18-en.pdf>> accessed 26 November 2024; The Conference of the Parties to the Convention on Biological Diversity, 'Marine and Coastal Biodiversity: Revised Voluntary Guidelines for the Consideration of Biodiversity in Environmental Impact Assessments and Strategic Environmental Assessments in Marine and Coastal Areas' (2012) UNEP/CBD/COP/11/23 <<https://www.cbd.int/doc/meetings/cop/cop-11/official/cop-11-23-en.pdf>> accessed 26 November 2024.

¹¹³³ The Conference of the Parties to the Convention on Biological Diversity, 'Impact Assessment: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment' (n 1132) para 5.

¹¹³⁴ The Conference of the Parties to the Convention on Biological Diversity, 'Marine and Coastal Biodiversity: Revised Voluntary Guidelines for the Consideration of Biodiversity in Environmental Impact Assessments and Strategic Environmental Assessments in Marine and Coastal Areas' (n 1132).

At the screening stage, criteria, which can be found in national biodiversity strategies and action plans or equivalent documents, should be used to screen out those proposals that have potentially significant impacts on biodiversity.¹¹³⁵ For instance, it should be asked whether the intended activity (such as OWE) has any direct or indirect impacts or causes changes that increase the risks of extinction of species, loss of habitats or ecosystems, and loss of ecosystem services of social and economic value.¹¹³⁶ It is also important to determine the size of the affected area, the duration and frequency of the activity, the magnitude of change as a result of the activity, the important biodiversity areas in the map, and their legal status.¹¹³⁷ Furthermore, the project itself is not always a determining factor in screening out the intended activities, but it is essential to check the sensitivity of the receiving environment.¹¹³⁸ Important areas for ecosystem services should be preserved and EIA is required for these areas. These areas include the following areas as being important for (i) Regulating services in terms of maintaining biodiversity such as protected areas, areas containing threatened ecosystems outside protected areas, areas important for the maintenance of key ecological or evolutionary processes, and habitats for threatened species; (ii) Regulating services for maintaining natural processes about soil, water, or air such as coastal or buffer offshore areas; (iii) Providing services such as traditionally used waters by Indigenous people or coastal communities; (iv) Providing cultural services such as scenic landscapes and heritage sites; and (v) Providing other services such as catchment areas.¹¹³⁹

¹¹³⁵ *ibid.*

¹¹³⁶ *ibid* para 8 of the annex.

¹¹³⁷ *ibid* para 12 of the annex.

¹¹³⁸ *ibid* para 10(b) of the annex.

¹¹³⁹ *ibid* para 16 of the annex.

At a scoping stage, the competent authorities should define the focus of the study and identify key issues and alternatives in the impact assessment. Authorities must also consider the remedial actions and their application when assessing the environmental impact of a project.¹¹⁴⁰ Distinction and priority should be respectively made among avoidance, mitigation, and compensation: (i) First of all, impacts must be prevented and avoided. (ii) Secondly, the impact must be mitigated by considering various factors such as scale, location, management, and monitoring of activities and restoration; and (iii) Thirdly, compensation shall be given, when possible. It is appropriate to reject projects that cause irreversible damage or irreplaceable loss of biodiversity.¹¹⁴¹

In the scoping and study of impacts, asking questions about the following non-exhaustive items can be helpful: (i) The nature, magnitude, location, timing, duration, and frequency of the activities of a project; (ii) The possible alternatives, which among others include location alternatives, scale alternatives, and technology alternatives; (iii) The expected biophysical changes to the components of the environment and the spatial and temporal scale of such changes with cumulative effects and effects on connectivity between ecosystems; (iv) The effects on the composition and processes of ecosystems, mitigation measures, and any irreversible impacts and irreplaceable loss; (v) The current and potential beneficiaries of ecosystem services and the impacts of the project on such services; (vi) The possible measures to avoid, minimize or compensate the loss of or damage to the ecosystems; and (vii) Gaps in knowledge.¹¹⁴²

¹¹⁴⁰ *ibid* para 20 of the annex.

¹¹⁴¹ *ibid* para 23 of the annex.

¹¹⁴² *ibid* para 25 of the annex.

The guidelines provide some practical recommendations to address issues related to the conservation of biodiversity, which can be used in the impact assessment of OWE:

(i) In addition to the protection of species and their habitats, other factors such as diversity at the ecosystem level, non-protected biodiversity and ecological processes should be considered; (ii) The terms of reference of impact assessment should be clear and aligned with ecosystem approach; (iii) Baseline conditions should be defined; (iv) Spatial and temporal cause-effect chains should be identified and the potential indirect and cumulative impacts assessed; (v) Alternatives and mitigation measures must be identified; and (vi) The impacts on ecosystem processes must be assessed;¹¹⁴³

At the decision-making stage of OWE projects, the inclusion of biodiversity issues is an important factor that should be the basis of acceptance or rejection. The guidelines direct decision-making authorities to set criteria based on principles, targets, and standards for biodiversity to include these issues when trade-offs between different issues are done.¹¹⁴⁴ The guidelines also indicate how to apply the precautionary approach in practice. The guidelines advise that in case of high risk and significant potential harm to biodiversity, greater reliability and certainty of data and information is required.¹¹⁴⁵

Finally, at the monitoring stage, the implementation of mitigation measures is measured, and unforeseen impacts are identified to provide what the actual performance and the impacts of the project are.¹¹⁴⁶ The guidelines recommend that indicators be set to monitor the impacts of the project on the components of biodiversity. Such ecosystem-

¹¹⁴³ *ibid* para 27 of the annex.

¹¹⁴⁴ *ibid* para 41 of the annex.

¹¹⁴⁵ *ibid* para 42 of the annex.

¹¹⁴⁶ *ibid* para 46 of the annex.

related indicators, which should be specific, measurable, achievable, relevant, and timely, inform the authorities of the unacceptable changes in ecosystems to adapt and optimize the plans.¹¹⁴⁷

4.2.1.3 Protective Measures Against Noise

OWE generates noise, particularly during the construction period, which needs to be identified and controlled. The decision of the Conference of the Parties on the impacts of anthropogenic underwater noise on marine and coastal biodiversity encourages parties to take appropriate measures to avoid, minimize, and mitigate the potentially significant impacts of noise on marine and coastal biodiversity.¹¹⁴⁸ The measures can take various forms such as (i) Identifying the source, types, and intensities of noise; (ii) Conducting research to find gaps in knowledge; (iii) Developing quieter technologies and applying best available practices; (iv) Identifying affected areas by different noise and including them in the mapping distribution of sound; (v) Identifying sensitive areas to noise by mutual informing between the acoustic mapping and the habitats mapping of sound-sensitive species mapping; (vi) Mitigating and managing noise by having temporal and spatial knowledge about species or their distribution; (vii) Conducting impact assessments and monitoring programs to find the acoustic impacts of activities on noise-sensitive species; (viii) Considering noise in developing and establishing plans of marine protected areas; (ix) Defining noise thresholds to protect sound-sensitive species; (x) Setting metrics and measurements of sound for all types of sound and places; (xi) Raising awareness and

¹¹⁴⁷ *ibid* paras 47, 48 of the annex.

¹¹⁴⁸ The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity: Impacts on Marine and Coastal Biodiversity of Anthropogenic Underwater Noise and Ocean Acidification, Priority Actions to Achieve Aichi Biodiversity Target 10 for Coral Reefs and Closely Associated Ecosystems, and Marine Spatial Planning and Training Initiatives’ (2014) COP 12 Decision XII/23 para 3 <<https://www.cbd.int/doc/decisions/cop-12/cop-12-dec-23-en.pdf>> accessed 9 March 2024.

building capacity in the regions at issues; and (xii) Engaging stakeholders in developing relevant guidelines to facilitate their implementation.¹¹⁴⁹

4.2.1.4 Protective Measures to Mitigate Marine Debris

The decision on the impacts of marine debris on marine and coastal biodiversity encourages parties to take appropriate actions and policies to prevent and mitigate the potential adverse impacts of marine debris¹¹⁵⁰ on marine and coastal biodiversity and habitats.¹¹⁵¹ When there is a possibility of damage to marine and coastal biodiversity from marine debris, the parties should extend producer responsibilities to proactively respond to such damage.¹¹⁵² The annex of this decision also offers voluntary practical guidance to prevent and mitigate the impacts of marine debris on marine and coastal biodiversity and habitats. The annex generally insists on the prevention of marine debris and employment of economic and regulatory measures, which include: (i) The use of economic incentives and market-based instruments and identification; (ii) The application and dissemination of best practices in waste management; (iii) Integrated management, coordination and legislation on marine debris through national or regional plans; (iv) Mainstreaming marine debris consideration into regulatory frameworks of waste management and extended producer responsibility; (v) Setting strategies and quantifiable and operational targets in the management tools; and (vi) Developing risk management, spatial mapping, monitoring

¹¹⁴⁹ *ibid.*

¹¹⁵⁰ Marine debris is defined as ‘any persistent, manufactured or processed solid material discarded, disposed of, lost or abandoned in the marine and coastal environment’ and they should be prevented because they have two impacts: impacts on the health of human-being by their introduction into human food web, and impacts on marine organisms as they ingest debris, causing their death and facilitating passage of invasive alien species. paras 1-5 of the Annex of the decision.

¹¹⁵¹ Conference of the Parties to the Convention on Biological Diversity, ‘Addressing Impacts of Marine Debris and Anthropogenic Underwater Noise on Marine and Coastal Biodiversity’ COP 13 Decision XIII/10 paras 6, 8.

¹¹⁵² *ibid* para 7.

and follow-up strategies of impacts at population-level of species and their life processes.¹¹⁵³

4.2.1.5 How to Mainstream Biodiversity in the OWE Sector

There is a myriad of measures that can be adopted to mainstream biodiversity in the OWE sector. The measures include:

- (i) Strategic decision-making and planning at the national level;
- (ii) Regulating through sectoral laws and regulations and economic incentives;
- (iii) Spatial planning to identify the best possible outcomes for biodiversity to minimize the impacts of activities;
- (iv) Adopting measures and policies at the site or production point and in the supply chain to address the impact on biodiversity;
- (v) Using strategic impact assessments to identify the needs, and explore alternative pathways at national and regional stages to reach the policy or plan objectives;
- (vi) Integrating biodiversity considerations into the legislation related to impact assessments and factoring such considerations in the impact assessments of the projects;
- (vii) Applying “mitigation hierarchy”, i.e. Avoidance impacts, minimizing damage, restoring damaged species and/or habitats, and offsetting compensating damage to biodiversity as only a last resort and avoiding biologically important areas for development activities;

¹¹⁵³ *ibid* paras 7, 9 of the annex.

- (viii) Developing national biodiversity strategies and action plans by governments;¹¹⁵⁴
- (ix) Conserving ecosystem structure and functioning to maintain ecosystem services;¹¹⁵⁵
- (x) Protecting species as well as the biological diversity over a long period of time;¹¹⁵⁶
- (xi) Aligning specific indicators and timelines with targets set for the preservation of marine and coastal biodiversity;¹¹⁵⁷and
- (xii) Employing the precautionary principle, ecosystem approach, integrated coastal zone management, MSP, and impact assessments.¹¹⁵⁸

4.2.2 The Convention on Migratory Species

4.2.2.1 General Remarks

Although Canada is not a party to the Convention on the Conservation of Migratory Species of Wild Animals¹¹⁵⁹ (“The Convention on Migratory Species” or “CMS”), which

¹¹⁵⁴ The Conference of the Parties to the Convention on Biological Diversity, ‘Mainstreaming of Biodiversity in the Energy and Mining, Infrastructure, Manufacturing and Processing, and Health Sectors’ (2017) CBD/SBSTTA/21/5 para 43, 53, 54, 58, 69
<<https://www.cbd.int/doc/c/8f3a/1121/6734c3a8082948ad3ee71a44/sbstta-21-05-en.pdf>> accessed 27 February 2024.

¹¹⁵⁵ The Conference of the Parties to the Convention on Biological Diversity, ‘The Ecosystem Approach’ (n 1111) para 6, principle 5.

¹¹⁵⁶ *ibid* para 6.

¹¹⁵⁷ The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity’ (n 822) para 16.

¹¹⁵⁸ *ibid* para 15.

¹¹⁵⁹ Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 June 1979, entered into force 1 November 1983) 1760 UNTS 79.

aims to protect the listed migratory species in the Appendices I and II of the Convention,¹¹⁶⁰ the CMS Conference of the Parties has encouraged Non-Parties, which exercise jurisdiction over ‘areas that a migratory species inhabits or is expected to inhabit in the near future due to climate change’, to participate in CMS and relevant CMS instruments.¹¹⁶¹ In addition, until Canada becomes a Party to this Convention, which is recommended, there are regulatory actions that can benefit the framework needed to regulate the impacts of OWE.

The Convention on Migratory Species aims to protect migratory species through listing them. The Convention categorizes migratory species into two lists. Appendix I consists of migratory species which are endangered.¹¹⁶² Appendix II includes migratory species that have one of the following features: (i) They have an unfavourable status in which their conservation and management require international agreements; and (ii) species that have conservation status, which would significantly benefit from the international cooperation that could be achieved by international agreements.¹¹⁶³

The criteria used in the Convention to determine whether a conservation status is favourable can guide Canada on how to conserve migratory species. The Convention states

¹¹⁶⁰ ‘Parties and Range States | CMS’ <<https://www.cms.int/en/parties-range-states>> accessed 7 May 2024; Environment and Climate Change Canada, ‘Conservation of Migratory Wild Animals Species: Convention’ (26 February 2015) <<https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/conservation-migratory-wild-animals-species.html>> accessed 7 May 2024. According to the CMS website, as of 1 March 2022, the Convention on Migratory Species has 133 Parties. It should be noted that migratory species means ‘the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries’ (Article I.1(a))

¹¹⁶¹ The CMS Conference of the Parties, ‘Migratory Species Conservation in the Light of Climate Change’ (2011) UNEP/CMS/Resolution 10.19 para 1 <https://www.cms.int/sites/default/files/document/cms_ccwg2017_inf-2_res-10-19_0.pdf> accessed 9 May 2024.

¹¹⁶² Convention on the Conservation of Migratory Species of Wild Animals (n 1159) art III.1.

¹¹⁶³ *ibid* art IV.1.

the following criteria to decide on whether a conservation status is regarded as favourable:

(i) Maintaining migratory species on a long-term basis; (ii) No current or likely reduction in the range of the migratory species on a long-term basis; (iii) The presence of the current and foreseeable future sufficient habitat for maintaining the migratory species on a long-term basis; and (iv) Achieving coverage and level in the distribution and abundance of the migratory species that ensure potential existence of suitable ecosystems and align with wise wildlife management.¹¹⁶⁴ Using these criteria can facilitate to what extent OWE projects can cause effects or obstacles that seriously impede or prevent the migration of the species, although this is an obligation of the Parties that are Range States of a migratory species listed in Appendix I.¹¹⁶⁵ In addition, nothing prevents Canada (including being a non-party to the Convention) from considering concluding agreements when it benefits the migratory species or those species in unfavourable conservation status.¹¹⁶⁶

4.2.2.2 OWE and Migratory Species

The Conference of the Parties (the COP of CMS) has confirmed the likely environmental impacts of wind energy on migratory species of mammals and birds, their food sources, and their habitats. The COP of CMS has identified some of these impacts, which include destruction or disturbance of habitats, collision risk for birds, electromagnetic fields of cables, and emission of noise and vibrations into the water.¹¹⁶⁷

¹¹⁶⁴ *ibid* art I.1.

¹¹⁶⁵ *ibid* art III.4(b).

¹¹⁶⁶ *ibid* art IV.3.

¹¹⁶⁷ The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (2017) UNEP/CMS/Resolution 7.5 (Rev.COP12); The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (2002) UNEP/CMS/Resolution 7.5.

The COP of CMS has called upon the parties to CMS to protect migratory species against such impacts by (i) Identifying areas where migratory species are vulnerable to the development of wind turbines, (ii) Taking the precautionary principle into account in this development, and (iii) Considering data and information resulting from environmental impacts assessments, monitoring, and spatial planning processes.¹¹⁶⁸ The COP of CMS also called for parties to take appropriate measures to prevent or reduce the impacts of renewable energy or wind turbines on wildlife animals. The measures include:

- (i) Minimizing the impacts of technologies such as renewable energy through the application of impact assessments, design, and siting;¹¹⁶⁹
- (ii) Identifying high-risk areas and adopting strategic planning and siting through SEA on large spatial scales to avoid environmental risks;¹¹⁷⁰
- (iii) Including an appropriate ecological assessment in EIA and SEA when there are likely risks affecting protected and critical areas;¹¹⁷¹
- (iv) Identifying areas where migratory species are vulnerable to wind turbines;¹¹⁷²
- (v) Evaluating the location of wind turbines to protect migratory species;¹¹⁷³
- (vi) Configuring wind farms by planning a larger space in between turbines, using turbine types with larger space beneath rotor blades, and placing long lines of

¹¹⁶⁸ The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (n 1167) para 1.

¹¹⁶⁹ The CMS Conference of the Parties, ‘Climate Change and Migratory Species’ (2024) UNEP/CMS/Resolution 12.21 (Rev.COP14) para 15
<https://www.cms.int/sites/default/files/document/cms_cop14_res.12.21_rev.cop14_climate-change-and-migratory-species_e.pdf> accessed 9 May 2024.

¹¹⁷⁰ The CMS Conference of the Parties, ‘Renewable Energy Technologies and Migratory Species: Guidelines for Sustainable Development’ (2014) UNEP/CMS/COP11/Doc.23.4.3.2 65.

¹¹⁷¹ The CMS Conference of the Parties, ‘Power Lines and Migratory Birds’ (2014) UNEP/CMS/Resolution 10.11 (Rev.COP13) para 2.1; The CMS Conference of the Parties, ‘Renewable Energy and Migratory Species’ (2020) UNEP/CMS/Resolution 11.27 (Rev.COP13) para 2 (a).

¹¹⁷² The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (n 1167) para 1(a).

¹¹⁷³ *ibid* para 1(b).

- turbines in parallel to migration routes/corridors to lower the collision rate of birds and barrier effects for foraging and breeding birds;¹¹⁷⁴
- (vii) Cooperating among governments and the private sector to protect possible negative effects of offshore wind turbines on migratory species;¹¹⁷⁵
 - (viii) Surveying and monitoring environmental impacts of wind power on migratory species and their habitats before the construction of renewable energy and throughout the operation period;¹¹⁷⁶
 - (ix) Adopting measures such as short-term shutdowns or higher cut-in speed where there are significant impacts from renewable energy on migratory species;¹¹⁷⁷
 - (x) Applying the Best Environmental Practice (BEP) and the Best Available Techniques (BAT) to reduce or mitigate marine noise;¹¹⁷⁸
 - (xi) Using noise reduction techniques such as bubble curtains, or suitable foundation types such as floating platforms or pile drilling instead of pile driving;¹¹⁷⁹
 - (xii) Reducing noise from other sources (e.g. ships) and lowering impacts on marine mammals by use of technology (e.g. acoustic deterrent devices);¹¹⁸⁰

¹¹⁷⁴ The CMS Conference of the Parties, ‘Renewable Energy Technologies and Migratory Species: Guidelines for Sustainable Development’ (n 1170) 67.

¹¹⁷⁵ The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (n 1167) para 2.

¹¹⁷⁶ The CMS Conference of the Parties, ‘Migratory Species Conservation in the Light of Climate Change’ (n 1161) para 12; The CMS Conference of the Parties, ‘Renewable Energy and Migratory Species’ (n 1171) para 2(c).

¹¹⁷⁷ The CMS Conference of the Parties, ‘Migratory Species Conservation in the Light of Climate Change’ (n 1161) para 13; The CMS Conference of the Parties, ‘Climate Change and Migratory Species’ (n 1169) 7.

¹¹⁷⁸ The CMS Conference of the Parties, ‘Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species’ (n 1046) para 14.

¹¹⁷⁹ *ibid* para 15.

¹¹⁸⁰ The CMS Conference of the Parties, ‘Renewable Energy Technologies and Migratory Species: Guidelines for Sustainable Development’ (n 1170) 68.

- (xiii) Evaluating the effectiveness of mitigation measures and accordingly providing modifications;¹¹⁸¹
- (xiv) Adopting regulatory or contractual clear procedures to integrate the consideration of biodiversity and migratory species and provide for consequences in case of violations;¹¹⁸²
- (xv) Studying the cumulative effects to describe the impacts of the development of renewable energy on the migratory species at large scales (e.g. the scale at flyways of birds or the population of migratory species);¹¹⁸³ and
- (xvi) Conducting research on the impact of underwater noise from OWE on CMS-listed species and their prey, their migration route, and ecological coherence.¹¹⁸⁴

4.2.3 Convention on Wetlands of International Importance especially as Waterfowl Habitat

Canada is a party¹¹⁸⁵ to the Convention on Wetlands of International Importance, especially as Waterfowl Habitat (The Ramsar Convention)¹¹⁸⁶, which is the convention for the protection of wetlands. Under the Ramsar Convention, wetlands¹¹⁸⁷ are protected

¹¹⁸¹ The CMS Conference of the Parties, ‘Renewable Energy and Migratory Species’ (n 1171) para 2 (c).

¹¹⁸² *ibid* para 2(e).

¹¹⁸³ *ibid* para 2(f).

¹¹⁸⁴ The CMS Conference of the Parties, ‘Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species’ (n 1046) para 1.

¹¹⁸⁵ ‘Contracting Parties to the Ramsar Convention’

<https://www.ramsar.org/sites/default/files/documents/library/annotated_contracting_parties_list_e.pdf> accessed 26 November 2024.

¹¹⁸⁶ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (adopted 2 February 1971, entered into force 21 December 1975) 996 UNTS 245.

¹¹⁸⁷ *ibid* art 1.1. This article states that ‘For the purpose of this Convention wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.’

because they are ecologically important in the protection of flora, fauna, and habitats of waterfowl, which transcend frontiers in their seasonal migration.¹¹⁸⁸

In terms of the application of the Convention, it should be noted that the exact impacts of OWE on wetlands need to be researched and depend on the location of OWE sites. Wetlands include ‘areas of marine water the depth of which at low tide does not exceed six metres’.¹¹⁸⁹ In addition, the Parties may include marine areas deeper than six meters when they designate wetlands under their jurisdiction in a “List of Wetlands of International Importance”.¹¹⁹⁰ Both these cases set limitations for the construction of OWE sites in wetlands.

Canada has designated 37 sites, which are listed under the Convention.¹¹⁹¹ Some of these sites are located in Nova Scotia and Newfoundland. In terms of application of this Convention to OWE, it can be said that impacts may include collision and electrocution of birds and bats, and conversion of wetlands for operation, storage, and transmission facilities.¹¹⁹²

Moreover, an authorization of OWE projects should not be inconsistent with the obligation of each party under the Ramsar Convention. If there are impacts on wetlands and waterfowl, conflict may arise between the development of OWE projects and the obligations under the Ramsar Convention. Under the Ramsar Convention, each party must

¹¹⁸⁸ *ibid* preamble and art 1.2.

¹¹⁸⁹ Soria-Rodríguez (n 1049) 56.

¹¹⁹⁰ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (n 1186) art 2.1.

¹¹⁹¹ ‘Ramsar Sites Information Service-Annotated List of Wetlands of International Importance: Canada’ <https://rsis.ramsar.org/sites/default/files/rsiswp_search/exports/Ramsar-Sites-annotated-summary-Canada.pdf> accessed 28 May 2024.

¹¹⁹² The Conference of the Parties to the Ramsar Convention, ‘Guidance for Addressing the Implications for Wetlands of Policies, Plans and Activities in the Energy Sector’ (2012) Resolution XI.10 2.

promote the conservation of wetlands and waterfowl by adopting and implementing plans, establishing nature reserves on wetlands, and promoting the increase in the population of waterfowl.¹¹⁹³ In addition, the projects must be planned and implemented in a way that such obligations are not undermined. If such conflicts arise and the party to the Convention deletes or restricts the boundaries of a wetland because of the deployment of marine renewable energy, based on article 4.2, it is argued that such party should compensate for any loss of wetland resources or create an additional nature reserve for waterfowl.¹¹⁹⁴ It is difficult to apply this provision to offshore renewable technologies because Article 4.2 qualifies this possibility in cases where an “urgent national interest” is involved and it is hard to imagine a case where deployment of OWE is considered an urgent national interest. According to the general guidance for interpreting “urgent national interests”, the determination of this issue falls within the sole discretion of the contracting parties to the Ramsar Convention.¹¹⁹⁵ However, this guidance provides some factors that can be considered by the parties. For example, factors include consideration of the national, social, economic, and ecological benefits and functions of the wetland site in question, the urgency of actions needed to avert a significant threat, all reasonable alternatives to the project (different options such as no project, alternative locations, buffer zones, alternatives with the best-minimizing harm to the site), and the benefits of the project over a long period.¹¹⁹⁶

¹¹⁹³ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (n 1186) arts 3.1, 4.1, and 4.4.

¹¹⁹⁴ Soria-Rodríguez (n 1049) 56.

¹¹⁹⁵ The Conference of the Parties to the Ramsar Convention, ‘General Guidance for Interpreting “Urgent National Interests” under Article 2.5 of the Convention and Considering Compensation under Article 4.2’ (2002) Resolution VIII.20 Annex para 3.

¹¹⁹⁶ *ibid.*

In any event, the conflicts between the development of OWE and wetlands and waterfowl should be identified, and appropriate measures should be taken. The Conference of the Parties to the Ramsar Convention has underlined the importance of conducting such environmental assessments by expanding its resolutions related to wetlands and extractive industries to include the renewable energy sector.¹¹⁹⁷ The COP of the Ramsar Convention has recommended that the parties apply COP's guidance on the environmental impact assessment and SEA.¹¹⁹⁸ It has also recommended that impacts on wetlands ecosystems and their ecosystem services should be avoided or mitigated as far as possible and that unavoidable impacts are sufficiently compensated based on national legislation.¹¹⁹⁹ In addition, when it is predicted that there might be serious or irreversible impacts on wetlands, a precautionary approach must be adopted.¹²⁰⁰

4.2.4 International Convention for the Regulation of Whaling

The advantage of marine renewable energy in reducing climate change, which especially benefits cetaceans (whales and dolphins), should be understood along with their impacts on ecosystems and physical and behavioural effects on cetaceans. These likely

¹¹⁹⁷ The Conference of the Parties to the Ramsar Convention, 'Guidance for Addressing the Implications for Wetlands of Policies, Plans and Activities in the Energy Sector' (n 1192) para 15; The Conference of the Parties to the Ramsar Convention, 'Wetlands and Extractive Industries' (2008) Resolution X.26.

¹¹⁹⁸ The Conference of the Parties to the Ramsar Convention, 'Guidance for Addressing the Implications for Wetlands of Policies, Plans and Activities in the Energy Sector' (n 1192) para 19(i); The Conference of the Parties to the Ramsar Convention, 'Environmental Impact Assessment and Strategic Environmental Assessment: Updated Scientific and Technical Guidance' (2008) Resolution X.17.

¹¹⁹⁹ The Conference of the Parties to the Ramsar Convention, 'Guidance for Addressing the Implications for Wetlands of Policies, Plans and Activities in the Energy Sector' (n 1192) para 19 (ii); The Conference of the Parties to the Ramsar Convention, 'An Integrated Framework and Guidelines for Avoiding, Mitigating and Compensating for Wetland Losses' (2012) Resolution XI.9.

¹²⁰⁰ The Conference of the Parties to the Ramsar Convention, 'Guidance for Addressing the Implications for Wetlands of Policies, Plans and Activities in the Energy Sector' (n 1192) para 19 (iv).

negative effects derive from noise during pile driving of OWE foundations or entanglement by cables.¹²⁰¹

The International Whaling Commission (IWC), which was established under the International Convention for the Regulation of Whaling¹²⁰², has considered the impacts of noise on cetaceans since 2004. The Scientific Committee, which is established under the IWC, has discussed different sources of noise, initiated by noise from seismic surveys and shipping.¹²⁰³ IWC Conservation Committee under its strategic plan considers anthropogenic sound as one of its priority threats.¹²⁰⁴ The IWC Scientific Subcommittee in 2024 reported that offshore renewable energy has become a substantial source of underwater noise.¹²⁰⁵ The IWC has also emphasized that the precautionary approach should be taken for anthropogenic underwater noise so that the lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures.¹²⁰⁶ In addition, the IWC has recommended that parties work with appropriate stakeholders to:

¹²⁰¹ ‘Marine Renewable Energy Developments’ (*International Whaling Commission*) <<https://iwc.int/management-and-conservation/environment/marine-renewable-energy-developments>> accessed 31 May 2024.

¹²⁰² International Convention for the Regulation of Whaling (adopted 12 February 1946, entered into force 11 October 1948) 161 UNTS 72; Government of Canada, ‘Canada Gazette, Part 2, Volume 152, Number 14: Regulations Amending the Marine Mammal Regulations’ (11 July 2018) <<https://www.gazette.gc.ca/rp-pr/p2/2018/2018-07-11/html/sor-dors126-eng.html>> accessed 16 December 2024.

¹²⁰³ ‘Contribution from the Secretariat of the International Whaling Commission to Part 1 of the Report of the United Nations Secretary General on Oceans and Law of the Sea: Anthropogenic Underwater Noise’ <https://iwc.int/private/downloads/FVRfmJ7hut8I8bLYNN9zwQ/anthropogenic_noise_UNGA_submission_FINAL.pdf> accessed 31 May 2024.

¹²⁰⁴ IWC Conservation Committee, ‘Strategic Plan 2016-2026’ <https://iwc.int/document_3708> accessed 31 May 2024.

¹²⁰⁵ The IWC Scientific Committee, ‘Report of the Scientific Committee’ (2024) SC69B 50 <<https://archive.iwc.int/pages/view.php?ref=22181&k=4328e9b854>> accessed 4 August 2024.

¹²⁰⁶ International Whaling Commission, ‘Resolution on Anthropogenic Underwater Noise’ (2018) Resolution 2018-4 para 2.

- i) Establish national and regional anthropogenic noise registers and monitoring programs to assess the impacts of underwater noise on cetaceans;
- ii) Support the development of mitigation strategies and best practices that protect cetaceans and ensure the comprehensive assessments of adverse effects of noise on cetaceans; and
- iii) Support measures such as noise standards by national and international authorities to reduce the impacts of underwater noise on cetaceans.¹²⁰⁷

Furthermore, the IWC has identified some strategies and principles to minimize the threats posed by marine renewable energy. The strategies and principles include the collection and analysis of data related to the impacts of development at appropriate temporal and geographical scale on (at least) the population of cetaceans, the development of mitigation measures, the consideration of impacts from all marine activities not a single development in isolation, the development of targeted monitoring programs and compliance mechanisms for mitigation measures and conservation objectives.¹²⁰⁸

4.2.5 Convention on the Protection of the Underwater Cultural Heritage

The Convention on the Protection of the Underwater Cultural Heritage aims to ensure the preservation and protection of underwater cultural heritage such as cultural, historical or archaeological sites.¹²⁰⁹ The Parties to the Convention must cooperate and take

¹²⁰⁷ *ibid* para 3 (b), (c), (d) & (f).

¹²⁰⁸ ‘Marine Renewable Energy Developments’ (n 1201).

¹²⁰⁹ Convention on the Protection of the Underwater Cultural Heritage (adopted 2 November 2001, entered into force 2 January 2009) 2562 UNTS 1 art 2. This Convention can be regarded as a variant of a multilateral environmental agreement, although it specifically addresses the protection of cultural heritage rather than broader environmental issues such as biodiversity or climate change. Whereas most multilateral environmental agreements concentrate on environmental protection in terms of ecosystems, species, or

all appropriate measures for this purpose, using ‘the best practicable means at their disposal and in accordance with their capabilities’.¹²¹⁰ For example, each Party to the Convention is required to prevent or reduce any negative impacts of activities within their jurisdiction that incidentally affect underwater cultural heritage, using “the best practicable means at its disposal”.¹²¹¹ Article 1.7 of the Convention defines “activities incidentally affecting underwater cultural heritage” as those activities that, while not primarily aimed at underwater cultural heritage, may nonetheless physically disturb or damage it.¹²¹²

Technological advances such as the construction of foundations of offshore wind turbines and laying related cables in the seabed may undermine the objective of protecting underwater cultural heritage. In cases where there is any underwater cultural heritage in the areas where OWE structures or cables will be constructed, the OWE construction activities may physically disturb or damage the underwater cultural heritage.

As required under Article 5 of the Conventions, appropriate measures must be taken to prevent or mitigate any adverse effects of OWE activities on underwater cultural heritage. For example, the Parties to the Convention should establish national regulations for authorizing interventions on underwater cultural heritage sites.¹²¹³ These regulations should also encompass activities that may incidentally affect these sites, as well as areas where the existence of such sites is uncertain but possible.¹²¹⁴ States are urged to mandate

natural resources, this Convention falls under the wider category of cultural heritage agreements with an environmental dimension. The underwater cultural heritage sites frequently exist within marine environments, thereby aligning their preservation efforts with environmental considerations, particularly marine conservation.

¹²¹⁰ *ibid.*

¹²¹¹ *ibid* art 5.

¹²¹² *ibid* art 1.7.

¹²¹³ UNESCO, ‘Operational Guidelines for the Convention on the Protection of the Underwater Cultural Heritage’ CLT/CEM/UCH/2023/OG 13.

¹²¹⁴ *ibid.*

the approval of their national competent authorities, as described in Article 22.1 of the Convention, for any such intervention.¹²¹⁵ Additionally, EIA and baseline surveys for identifying underwater cultural heritage and excluding them as marine protected areas or finding solutions that mitigate impacts are recommended.¹²¹⁶

While Canada is not a party to the Convention on the Protection of the Underwater Cultural Heritage, it still holds general obligations under the UNCLOS to preserve archaeological and historical objects discovered at sea and to cooperate with other states for this purpose.¹²¹⁷ The provisions of the Convention on the Protection of the Underwater Cultural Heritage, along with the related recommendations discussed in this section, can provide valuable guidance on implementing these responsibilities during the planning and authorization processes of OWE projects.

4.2.6 The International Convention for the Prevention of Pollution from Ships

The International Convention for the Prevention of Pollution from Ships (MARPOL)¹²¹⁸ seeks to prevent pollution caused by ships, whether operational or accidental, by regulating various pollutants such as oil, sewage, garbage, and air emissions. Canada is a party to MARPOL,¹²¹⁹ hence, preventing or mitigating pollution from ships is

¹²¹⁵ *ibid.*

¹²¹⁶ Charlotte Jarvis, Maria Pena Ermida and Ole Varmer, ‘Threats to Underwater Cultural Heritage from Existing and Future Human Activities’ (2023) 2 Blue Papers 76.

¹²¹⁷ United Nations Convention on the Law of the Sea (n 974) arts 149 and 300.

¹²¹⁸ The International Convention for the Prevention of Pollution from Ships (adopted 2 November 1973, entered into force 2 October 1983) 1340 UNTS 61 & 1341 UNTS 3.

¹²¹⁹ Environment and Climate Change Canada, ‘Preventing Pollution from Ships: MARPOL Protocol’ (16 February 2015) <<https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/preventing-pollution-ships.html>> accessed 19 February 2025.

critical in the context of OWE as ships provide services during the installation, operation, and maintenance (O&M) of OWE.

First, ships contribute to air pollution by emitting pollutants such as sulphur oxides and nitrogen oxides during the installation and O&M of OWE. MARPOL Annex VI (I (Prevention of Air Pollution from Ships) apply to the reduction of emission of various air pollutants such as sulphur oxides, nitrogen oxides, and GHG. For example, Regulation 14 of Annex VI imposes emission controls on sulphur oxides and particulate matter from ships combusting fuel oil.¹²²⁰ The controls on sulphur emissions in the Emission Control Areas, which are designated areas of the sea to minimize airborne emissions from ships, are stricter.¹²²¹

Another initiative was taken by IMO in 2011 by adopting amendments to MARPOL Annex VI, which mandated technical and operational energy efficiency measures to reduce CO₂ emissions from international shipping.¹²²² This led to the introduction of the Energy Efficiency Design Index and the Ship Energy Efficiency Management Plan, which came into effect on January 1, 2013, as the first global mandatory greenhouse gas reduction regime for an international industry sector.¹²²³ Furthermore, IMO Member States adopted additional energy efficiency measures in 2021, aiming to reduce

¹²²⁰ ‘Sulphur Oxides (SO_x) and Particulate Matter (PM) – Regulation 14’
<[https://www.imo.org/en/OurWork/Environment/Pages/Sulphur-oxides-\(SOx\)-%E2%80%93-Regulation-14.aspx](https://www.imo.org/en/OurWork/Environment/Pages/Sulphur-oxides-(SOx)-%E2%80%93-Regulation-14.aspx)> accessed 19 February 2025.

¹²²¹ *ibid.*

¹²²² ‘Improving the Energy Efficiency of Ships’
<<https://www.imo.org/en/OurWork/Environment/Pages/Improving%20the%20energy%20efficiency%20of%20ships.aspx>> accessed 19 February 2025.

¹²²³ *ibid.*

the carbon intensity of international shipping by at least 40% by 2030, compared to 2008 levels.¹²²⁴

IMO has also adopted the “2023 IMO Strategy on Reduction of GHG Emissions from Ships” which provides for certain targets such as net-zero emissions by 2050 and indicative checkpoints of 20% to 30% reduction in the total annual GHG emission from international shipping by 2030 and at least 70% reduction of such emissions by 2040.¹²²⁵

Second, ships may produce waste and pollute water by introducing sewage, garbage, and ballast water, which may lead to the pollution of the marine environment during installation and O&M of OWE. Annex IV (Prevention of Pollution by Sewage from Ships) and V of MARPOL (Prevention of Pollution by Garbage from Ships) require ships to manage their wastes (e.g. through regulations related to waste disposal). The regulations under Annex IV include those related to enhancing systems and equipment of ships to control sewage, requiring ports to provide sewage reception facilities, and requiring ships for survey and certification.¹²²⁶ Annex V also prohibits discharging all garbage (except otherwise provided) into the sea.¹²²⁷ The management of discharging ballast water is also complemented by the International Convention for the Control and Management of Ships’

¹²²⁴ *ibid.*

¹²²⁵ IMO, ‘2023 IMO Strategy on Reduction of GHG Emissions from Ships’ (2023) MEPC 80/WP.12 6 <<https://wwwcdn.imo.org/localresources/en/MediaCentre/PressBriefings/Documents/Clean%20version%20of%20Annex%201.pdf>> accessed 19 February 2025.

¹²²⁶ ‘Prevention of Pollution by Sewage from Ships’ <<https://www.imo.org/en/OurWork/Environment/Pages/Sewage-Default.aspx>> accessed 19 February 2025.

¹²²⁷ ‘Prevention of Pollution by Garbage from Ships’ <<https://www.imo.org/en/ourwork/environment/pages/garbage-default.aspx>> accessed 19 February 2025.

Ballast Water and Sediments¹²²⁸, which contains standards for managing and controlling ships' ballast water and sediments.¹²²⁹

Finally, the provision of services during installation and O&M of OWE may pose a risk of oil spills from ships. The Annex I of MARPOL sets regulations on the prevention of oil pollution from ships, including regulations on oil discharges, operational and accidental discharges, oil pollution emergency plans, and oil spill response equipment.¹²³⁰

4.2.7 Convention on Environmental Impact Assessment in a Transboundary Context and its Protocol

The Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention) aims to ensure that the transboundary environmental impacts of the projects are considered and appropriate measures are taken.¹²³¹ In cases where OWE projects span the borders of neighbouring countries or when they may significantly affect the shared marine environment through pollution or other impacts on landscapes, migratory species, fisheries, and biodiversity, this Convention applies.

¹²²⁸ International Convention for the Control and Management of Ships' Ballast Water and Sediments (adopted 13 February 2004, entered into force 8 September 2017).

¹²²⁹ 'International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)' <[https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-\(BWM\).aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx)> accessed 19 February 2025; Environment and Climate Change Canada, 'Ballast Water Management of Ships: International Convention' (17 February 2015) <<https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/ballast-water-management.html>> accessed 19 February 2025. According to this reference, Canada acceded to BWM in 2010.

¹²³⁰ 'MARPOL Annex I – Prevention of Pollution by Oil' <<https://www.imo.org/en/OurWork/Environment/Pages/OilPollution-Default.aspx>> accessed 19 February 2025.

¹²³¹ Convention on Environmental Impact Assessment in a Transboundary Context (adopted 25 February 1991, entered into force 10 September 1997) 1989 UNTS 309.

The Parties to the Convention, including Canada¹²³², are required to take all appropriate measures to ‘prevent, reduce and control significant adverse transboundary impact’ of activities.¹²³³ One of the measures is that the Party planning for OWE must undertake EIA if a proposed project listed in Appendix I may have a significant adverse transboundary impact.¹²³⁴ Although OWE is not listed in this Appendix, the amendment of this Convention included ‘major installations for the harnessing of wind power for energy production (wind farms)’.¹²³⁵ Hence, EIA must be undertaken for OWE projects that may have a significant adverse transboundary impact.

The Party planning for OWE projects must also notify affected Parties of the Convention, provide relevant information, consult on the likely effects of the project, and engage the public in the EIA process.¹²³⁶ For example, in the context of OWE, the impacts of the project on fisheries and migratory species are relevant impacts that should be examined whether the project has any transboundary impacts. In case of any significant transboundary impact, the Party planning for OWE must notify and consult with affected Parties. In addition, the consultation obligation includes measures to reduce or eliminate impacts including possible alternatives (e.g. “no-action alternative”, mitigation measures,

¹²³² ‘Compendium of Canada’s Engagement in International Environmental Agreements and Instruments: UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)’ <<https://www.canada.ca/content/dam/eccc/documents/pdf/international-affairs/compendium/2020/batch-2/convention-environmental-impact-assessment-transboundary-context-espoo-convention.pdf>> accessed 20 February 2025. According to this reference, Canada ratified the Espoo Convention on 13 May 1998 and the Convention is entered in to force in Canada on 11 August 11 1998.

¹²³³ Convention on Environmental Impact Assessment in a Transboundary Context (n 1231) art 2.1.

¹²³⁴ *ibid* art 2.3.

¹²³⁵ Amendment to the Convention on Environmental Impact Assessment in a Transboundary Context (adopted 4 June 2004, entered into force 23 October 2017); ‘Compendium of Canada’s Engagement in International Environmental Agreements and Instruments: UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)’ (n 1232). According to this recent reference, This amendment is ratified by Canada on 26 April 2018.

¹²³⁶ Convention on Environmental Impact Assessment in a Transboundary Context (n 1231) arts 2, 3, 4 and 5.

and monitoring).¹²³⁷ The outcome of EIA will be considered and a final decision will be taken.¹²³⁸

Finally, it should be noted that Canada is not a party to the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context¹²³⁹, but this Protocol applies to OWE. This Protocol requires the Parties to ensure that SEA is undertaken for plans and programs, including energy, and the projects listed in Annex II. Annex II of this Protocol expressly mentions “installations for the harnessing of wind power for energy production (wind farms)” and “industrial installations for the production of electricity”.¹²⁴⁰ SEA is also required for plans and programs using small areas at the local level or for minor modifications only if they are likely to have significant environmental effects.¹²⁴¹ This Protocol can offer guidance on the processes of SEA including screening, scoping, environmental reports, public participation, consultation with environmental and health authorities, transboundary consultations, decision-making, and monitoring.¹²⁴²

4.3 Regional Agreements

Regulating OWE activities has been the subject of regional agreements. Some examples of such regional agreements are CMS sub-agreements, which include the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and

¹²³⁷ *ibid* art 5.

¹²³⁸ *ibid* art 6.

¹²³⁹ Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (adopted 21 May 2003, entered into force 11 July 2010) 2685 UNTS 140.

¹²⁴⁰ *ibid* Annex II.

¹²⁴¹ *ibid* arts 4.4 and 5.1.

¹²⁴² *ibid* arts 5-12.

Contiguous Atlantic Area (ACCOBAMS)¹²⁴³; the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS)¹²⁴⁴; the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)¹²⁴⁵; and the Agreement on the Conservation of Populations of European Bats (EUROBATS)¹²⁴⁶. Regional sea conventions include the OSPAR Convention¹²⁴⁷ and the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention)¹²⁴⁸ along with its Protocol on Integrated Coastal Zone Management (ICZM Protocol)¹²⁴⁹. From the regional sea agreements, the most informative one, i.e. the OSPAR Convention, will be discussed.

Canada is not a party to these agreements and conventions, but it could use or implement their recommendations in the planning, regulations, and impact assessments of OWE. It is also noteworthy that Article 208 UNLCOS applies to seabed activities such as OWE installations/structures in areas subject to national jurisdiction.¹²⁵⁰ According to this Article, coastal States must adopt laws and regulations and take other measures to “prevent, reduce, and control pollution of the marine environment” from seabed activities such as

¹²⁴³ Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (adopted 24 November 1996, entered into force 1 June 2001) 36 ILM 777.

¹²⁴⁴ The Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (adopted 17 March 1992, entered into force 29 March 1994) 1772 UNTS 217.

¹²⁴⁵ Agreement on the Conservation of African-Eurasian Migratory Waterbirds (adopted 16 June 1995, entered into force 1 November 1999) 2365 UNTS 251.

¹²⁴⁶ Agreement on the Conservation of Populations of European Bats (adopted 4 December 1991, entered into force 16 January 1994) 1863 UNTS 101.

¹²⁴⁷ Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) (adopted 22 September 1992, entered into force 25 March 1998) 2354 UNTS 67.

¹²⁴⁸ The Convention for the Protection of the Mediterranean Sea Against Pollution (adopted 16 February 1976, entered into force 15 April 1978) 1102 UNTS 27.

¹²⁴⁹ Protocol on Integrated Coastal Zone Management in the Mediterranean (adopted 21 January 2008, entered into force 24 March 2011).

¹²⁵⁰ Firestone and Jarvis (n 1046) 130.

installations and structures under their jurisdiction.¹²⁵¹ In addition, these laws, regulations, and measures ‘shall be no less effective than international rules, standards, and recommended practices and procedures’.¹²⁵² Although recommendations related to noise under the CMS sub-agreements might not be regarded as international rules or global agreements, they might be considered “recommended practices” that should be considered by Canada in the laws, regulations, or other measures in accordance with Article 208 of UNCLOS. Therefore, this Article of UNCLOS underscores the importance of considering the recommendations under the following CMS sub-agreements.

4.3.1 CMS Sub-Agreements

4.3.1.1 Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area

Anthropogenic ocean noise, which travels hundreds of kilometers is recognized as a form of pollution that can have transboundary effects.¹²⁵³ It produces energy in the marine environment, which has adverse effects on marine life, including the impacts on the population level. In addition, ocean noise has been increasing over time due to different activities such as shipping, military activities, and oil and gas exploration.

ACCOBAMS recommends the use of impact assessments and the adoption of several measures to regulate marine activities. The parties to ACCOBAMS must carry out impact assessments to determine whether a development project should be allowed or

¹²⁵¹ United Nations Convention on the Law of the Sea (n 974) art 208(1) & (2).

¹²⁵² *ibid* art 208(3).

¹²⁵³ ACCOBAMS Meeting of the Parties, ‘Resolution 2.16 - Assessment and Impact Assessment of Man-Made Noise’ (2004) ACCOBAMS-MOP2/2004/Res2.16.

prohibited, and if it can be allowed, what conditions should be established for conducting such activity.¹²⁵⁴

In addition, concerning anthropogenic noise, the resolutions made by the ACCOBAMS recommend that the parties to the Agreement take appropriate measures including the following actions:

- i) To avoid activities that introduce noise in the habitats of vulnerable species, concentrated areas by marine mammals or endangered species;¹²⁵⁵
- ii) Considering the effects of underwater noise in the EIA and mitigation procedures;¹²⁵⁶
- iii) Considering underwater noise levels as a quality parameter in the assessment of habitats, zoning, and the management of protected areas;¹²⁵⁷
- iv) Setting limits to underwater noise, which is introduced by different marine activities;¹²⁵⁸
- v) Reducing the anthropogenic noise by using quieter technologies, BEP and BAT;¹²⁵⁹
- vi) Defining buffer zones around marine mammals habitats and establishing “safe, precautionary, and scientifically-based exclusion zones” around noise sources;¹²⁶⁰

¹²⁵⁴ *ibid.*

¹²⁵⁵ *ibid* para 1.

¹²⁵⁶ ACCOBAMS Meeting of the Parties, ‘Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area’ (2007) ACCOBAMS-MOP3/2007/Res3.10 para 1(d); ACCOBAMS Meeting of the Parties, ‘Addressing the Impact of Anthropogenic Noise’ (2013) ACCOBAMS-MOP5/2013/Res5.15 para 5.

¹²⁵⁷ ACCOBAMS Meeting of the Parties, ‘Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area’ (n 1256) para 1(e).

¹²⁵⁸ *ibid* para 1(f).

¹²⁵⁹ *ibid* para 4; ACCOBAMS Meeting of the Parties, ‘Addressing the Impact of Anthropogenic Noise’ (n 1256) para 5.

¹²⁶⁰ ACCOBAMS Meeting of the Parties, ‘Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area’ (n 1256) para 12.

- vii) Including the baseline biological and environmental information, operations and their noise components, impacts on cetaceans and the cumulative effects from other sources, evaluation of risks against alternatives, as well as mitigating and monitoring impacts before, during, and after the operation in the impact assessment;¹²⁶¹
- viii) Developing “noise hotspot maps” and “quiet zones”;¹²⁶²
- ix) Applying a precautionary approach;¹²⁶³
- x) Planning activities by collecting data related to the spatial and seasonal distribution of cetaceans and pollution density in the area for operation,¹²⁶⁴
- xi) Assessing the impacts of noise on the area and designating exclusion zones by modelling the sound and determining exposure levels for species;¹²⁶⁵
- xii) Employing trained and approved cetacean observers for monitoring, mitigation implementation, and reporting programs;¹²⁶⁶
- xiii) Scheduling the noisy activities according to the presence of cetaceans to avoid impacts on cetaceans and concentrating noisy operations in short periods to minimize noise impacts;¹²⁶⁷

¹²⁶¹ ACCOBAMS Meeting of the Parties, ‘Anthropogenic Noise’ (2016) ACCOBAMS-MOP6/2016/Res6.17 para 3.

¹²⁶² ACCOBAMS Meeting of the Parties, ‘Anthropogenic Noise’ (2019) ACCOBAMS-MOP7/2019/Res7.13 para 19.

¹²⁶³ *ibid* para 23.

¹²⁶⁴ *ibid* Annex 2 Guidelines to Address the Impact of Anthropogenic Noise on Cetaceans in the ACCOBAMS Area, A. General Guidelines.

¹²⁶⁵ *ibid* Annex 2 Guidelines to Address the Impact of Anthropogenic Noise on Cetaceans in the ACCOBAMS Area.

¹²⁶⁶ *ibid*.

¹²⁶⁷ *ibid* Annex 2 Guidelines to Address the Impact of Anthropogenic Noise on Cetaceans in the ACCOBAMS Area, D. Guidelines for Coastal and Offshore Construction Works.

- xiv) Modelling the sounds introduced by activities based on geological and oceanographic features;¹²⁶⁸
- xv) Monitoring noise in monitoring stations to ensure noise does not reach the predicted levels;¹²⁶⁹ and
- xvi) Dedicating watch for at least 30 minutes for waters not exceeding 200 meters/120 minutes for waters exceeding 200 meters to ensure animals are not present in the exclusion areas.¹²⁷⁰

4.3.1.2 Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas

Various resolutions under ASCOBAMS support the regulation of activities that have adverse effects on cetaceans. Various Meetings of the Parties to ASCOBANS have recommended regulatory measures to control the adverse effects of marine activities that apply to the development of OWE. Such regulatory measures include:

- i) Developing regulatory measures such as EIA to reduce the impacts on small cetaceans;¹²⁷¹
- ii) Conducting more research on the physical and behavioural effects of windfarms on the individual and population level of small cetaceans, management, and technological measures to minimize the impact on small cetaceans, and guidelines on the effectiveness of such measures;¹²⁷²

¹²⁶⁸ *ibid* Annex 2, D. Guidelines for Coastal and Offshore Construction Works.

¹²⁶⁹ *ibid*.

¹²⁷⁰ *ibid*.

¹²⁷¹ ASCOBANS Meeting of the Parties, 'Adverse Effects of Sound, Vessels and Other Forms of Disturbance on Small Cetaceans' (2006) UNEP/ASCOBANS/Resolution 5.4 para 1.

¹²⁷² *ibid* paras 2-4.

- iii) Adopting a strategic approach to the siting of marine renewable energy projects and using EIA and SEA before the construction of marine renewable energy in which cumulative effects of pressures in the area are considered;¹²⁷³
- iv) Taking precautionary guidance on measures and procedures including appropriate siting of devices, avoiding the introduction of high underwater noise during periods when small cetaceans are present, alerting small cetaceans of potential harmful activities;¹²⁷⁴
- v) Developing mitigation, adaptive, and assessment measures to minimize the effects of marine renewable energy construction and production on small cetaceans;¹²⁷⁵
- vi) Adopting BAT and BEP and considering the technical “EIA Guideline for Other Noise-generating Activities (Acoustic Data Transmission, Wind, Tidal and Wave Turbines and Future Technologies)” by the Parties, the private sector and other stakeholders to minimize the impacts of clean technologies;¹²⁷⁶
- vii) Researching and monitoring the environmental risks of using ocean energy including effects from collisions, underwater noise, habitat alteration, and pollution from paint and lubricants;¹²⁷⁷

¹²⁷³ ASCOBANS Meeting of the Parties, ‘Adverse Effects of Underwater Noise on Marine Mammals during Offshore Construction Activities for Renewable Energy Production’ (2009) UNEP/ASCOBANS/Resolution 6.2 para 1; ASCOBANS Meeting of the Parties, ‘Managing Cumulative Anthropogenic Impacts in the Marine Environment’ (2016) UNEP/ASCOBANS/Resolution 8.9 para 4.

¹²⁷⁴ ASCOBANS Meeting of the Parties, ‘Adverse Effects of Underwater Noise on Marine Mammals during Offshore Construction Activities for Renewable Energy Production’ (n 1273) para 2.

¹²⁷⁵ *ibid* para 4.

¹²⁷⁶ ASCOBANS Meeting of the Parties, ‘CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-Generating Activities’ (2020) UNEP/ASCOBANS/Res.8.11(Rev.MOP9) para 9.

¹²⁷⁷ ASCOBANS Meeting of the Parties, ‘Ocean Energy’ (2016) UNEP/ASCOBANS/Resolution 8.6 para 3.

- viii) Ensuring appropriate baseline assessments of habitat use before the construction of ocean energy devices;¹²⁷⁸
- ix) Learning from previous experiences to understand animals' responses, monitor effects, mitigate risks, and develop new adaptable technologies;¹²⁷⁹
- x) Using MSP for appropriate siting of ocean energy devices, and promoting cross-company collaborations as well as cross-sectoral and transboundary consultations to protect critical habitats, migration corridors, and the wider marine environment;¹²⁸⁰ and
- xi) Urging the private sector to conduct baseline monitoring and controlled impact studies before construction activities.¹²⁸¹

4.3.1.3 Agreement on the Conservation of African-Eurasian Migratory Waterbirds

Two resolutions adopted under AEWA encourage the Contracting Parties to take appropriate actions to avoid or minimize the adverse effects of renewable energy, including OWE. The resolutions call upon the Contracting Parties to:

- i) Undertake SEA and EIA based on international guidelines and recommendations to identify suitable areas for the development of renewable energy devices and avoid areas that might have negative effects on protected areas or cause

¹²⁷⁸ *ibid* para 4.

¹²⁷⁹ *ibid* para 5.

¹²⁸⁰ *ibid* para 7; ASCOBANS Meeting of the Parties, 'Managing Cumulative Anthropogenic Impacts in the Marine Environment' (n 1273) paras 3 and 5.

¹²⁸¹ ASCOBANS Meeting of the Parties, 'Managing Cumulative Anthropogenic Impacts in the Marine Environment' (n 1273) para 9.

- displacement or disturbance of migratory waterbirds such as migration corridors, Ramsar Sites, Special Protection Areas, and Important Bird Areas;¹²⁸²
- ii) Avoid, minimize, or mitigate the impacts (e.g. disturbance effects) on waterbirds based on AEWA’s Guidelines No.11;¹²⁸³
 - iii) Ensure monitoring biodiversity effects of the development and consider lessons learned in future development planning;¹²⁸⁴
 - iv) Consider the compensation for damages to biodiversity as a result of development, where avoidance or mitigation is not possible, based on the relevant Ramsar Resolutions;¹²⁸⁵
 - v) Encourage operators to minimize bird mortality in wind farms, introduce short-term shutdown and “shut-down on demand” during peak migration, minimize lighting in wind farms, and map main migration corridors and crossings;¹²⁸⁶
 - vi) Undertake cumulative impact assessment to identify the larger impacts on the population level or along the entire flyway.¹²⁸⁷

¹²⁸² AEWA Meeting of the Parties, ‘Renewable Energy and Migratory Waterbirds’ (2012) Resolution 5.16 paras 1.1, 1.2, and 1.4; AEWA Meeting of the Parties, ‘Addressing Impacts of Renewable Energy Deployment on Migratory Waterbirds’ Resolution 6.11 para 1.1.

¹²⁸³ AEWA Meeting of the Parties, ‘Renewable Energy and Migratory Waterbirds’ (n 1282) para 1.6; Graham Tucker and Treweek, ‘AEWA Conservation Guidelines No. 11: Guidelines on How to Avoid, Minimize or Mitigate Impact of Infrastructural Developments and Related Disturbance Affecting Waterbirds’ (2008) <https://www.unep-aewa.org/sites/default/files/publication/cg_11_0.pdf> accessed 21 August 2024.

¹²⁸⁴ AEWA Meeting of the Parties, ‘Renewable Energy and Migratory Waterbirds’ (n 1282) para 1.7; AEWA Meeting of the Parties, ‘Addressing Impacts of Renewable Energy Deployment on Migratory Waterbirds’ (n 1282) para 1.2.

¹²⁸⁵ AEWA Meeting of the Parties, ‘Renewable Energy and Migratory Waterbirds’ (n 1282) para 1.10. ; Ramsar Resolution VII.24 Compensation for lost wetland habitats and other functions (1999) and Ramsar Resolution VIII.20 General guidance for interpreting “urgent national interest” under Article 2.5 of the Convention and considering compensation under Article 4 (2002).

¹²⁸⁶ *ibid* paras 2.2 & 2.3; AEWA Meeting of the Parties, ‘Addressing Impacts of Renewable Energy Deployment on Migratory Waterbirds’ (n 1282) para 2.1.

¹²⁸⁷ AEWA Meeting of the Parties, ‘Addressing Impacts of Renewable Energy Deployment on Migratory Waterbirds’ (n 1282) para 1.3.

4.3.1.4 Agreement on the Conservation of Populations of European Bats

The Parties to EUROBATS have adopted resolutions to regulate the impacts of wind energy on bats. The latest resolution, which repealed the previous version, mainly calls for the Parties to take the following measures concerning wind energy:

- i) Avoid areas that would have impacts on bat populations and reduce mortality through using the best available technologies and measures including blade feathering, higher turbine cut-in wind speeds, and temporary shut-down of facilities during peak periods;¹²⁸⁸
- ii) Encourage stakeholders to collaborate, share information, and conduct research on the best methods to assess, mitigate, and monitor the impacts on bats;¹²⁸⁹
- iii) Conduct assessment for both pre-and post-construction as preconstruction assessments cannot fully predict post-construction mortality rates;¹²⁹⁰
- iv) Include mitigation measures as part of the conditions in the project approval;¹²⁹¹ and
- v) Follow the guidelines in the impact assessments and monitoring procedures.¹²⁹²

¹²⁸⁸ EUROBATS Meeting of the Parties, ‘Wind Turbines and Bat Populations’ (2022) EUROBATS.MoP9.Resolution9.4 paras 3 & 18.

¹²⁸⁹ *ibid* paras 4, 5 & 6.

¹²⁹⁰ *ibid* paras 7, 8 & 9.

¹²⁹¹ *ibid* para 19.

¹²⁹² *ibid* para 15; L Rodrigues and others (eds), *Guidelines for Consideration of Bats in Wind Farm Projects-Revision 2014* (UNEP/EUROBATS 2015).

4.4. A Regional Sea Agreement: OSPAR Convention

The OSPAR Commission, which is established under the Convention for the Protection of the Marine Environment of the North-East Atlantic¹²⁹³, has issued guidelines that apply to OWE. The OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development furnishes overarching directives for addressing environmental and conflict of use concerns across the five primary phases of offshore wind farms including location, licensing, construction, operation, and removal/decommissioning.¹²⁹⁴ For instance, the guidance advises that the location of wind farms must be carefully selected to be outside migration routes.¹²⁹⁵ The guidance also offers advice to minimize the conflict between OWE and other uses and the environmental marine protected areas. It generally advises that OWE should avoid sensitive and ecologically valuable areas, be in line with relevant protection and conservation targets, and be based on adequate temporal and spatial data.¹²⁹⁶ The OSPAR Commission has also published the Guidelines on Best Environmental Practice in Cable Laying and Operation.¹²⁹⁷ These Guidelines reiterated the definition of BEP in accordance with the Annex of the OSPAR Convention as “the application of the most appropriate combination of environmental control measures and strategies”.¹²⁹⁸ For instance, the Guidelines recommend that cables should be buried and

¹²⁹³ Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) (n 1247).

¹²⁹⁴ OSPAR Commission, ‘OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development’ (2008) Agreement 2008-3, para 6.

¹²⁹⁵ *ibid* para 12.

¹²⁹⁶ *ibid* para 14.

¹²⁹⁷ OSPAR Commission, ‘Guidelines on Best Environmental Practice (BEP) in Cable Laying and Operation’ (2012) Agreement 2012-2 <https://www.gc.noaa.gov/documents/2017/12-02e_agreement_cables_guidelines.pdf> accessed 21 August 2024.

¹²⁹⁸ *ibid* 6.

not placed in protected or sensitive areas.¹²⁹⁹ Such measures can mitigate the impacts of electromagnetic fields, protecting mammals and other marine animals.

4.5 International Soft Law Documents

International law includes documents that do not have binding effects on states. These documents are often issued at international summits such as the UN Earth Summits, by international organizations and institutions such as IRENA, or the United Nations bodies such as the UN General Assembly. Depending on the roles and functions of these bodies, the produced documents have encouraged the development of renewable energy or provided commitments to address the adverse effects of this technology.

4.5.1 The Brundtland Report

This report supports the development of renewable energy while cautioning about its ecological impacts. It considers renewable energy as the “untapped potential”, which is a foundation of global energy structure during the 21st century.¹³⁰⁰ The report identifies some main measures for encouraging the development of renewable energy, which include the removal of subsidies for coal, oil, and gas industries, the higher share and priority for the renewable energy sector in the energy policy, and supporting the energy supply chain to embrace this sector.¹³⁰¹ The report also indicates that the exploitation of renewable sources such as hydropower results in environmental risks and ecological problems.¹³⁰²

¹²⁹⁹ *ibid* 12.

¹³⁰⁰ The United Nations Environment Program (n 206) paras 62, 73-88.

¹³⁰¹ *ibid* paras 87-88.

¹³⁰² *ibid* paras 61, 81-82.

4.5.2 Stockholm Declaration

The principles outlined in the Stockholm Declaration emphasize the crucial importance of environmental protection, planning, and integrated management. Humans have the fundamental right to an environment of quality and the responsibility to protect and improve the environment for both present and future generations.¹³⁰³ Ecosystems, including natural resources, must be preserved, and the earth's capacity to regenerate and sustain itself should be maintained and restored.¹³⁰⁴ States are accountable for preventing pollutants that could harm the marine environment.¹³⁰⁵ Additionally, humans are tasked with conserving nature through careful planning in economic development.¹³⁰⁶ Effective integrated and coordinated management is essential to align development with environmental protection goals, and “rational planning” serves as a critical tool in balancing development needs with environmental preservation.¹³⁰⁷ Furthermore, national institutions should be entrusted with the responsibility of managing environmental resources to enhance environmental quality.¹³⁰⁸ Collectively, these principles advocate for a sustainable approach to development, promoting environmental stewardship and human rights while ensuring that activities, such as OWE, align with these goals.

¹³⁰³ Stockholm Declaration of the United Nations Conference on the Human Environment in the Report of the United Nations Conference on the Human Environment (1972) UN Doc A/CONF.48/14/Rev.1, principle 1.

¹³⁰⁴ *ibid* principles 2 and 3.

¹³⁰⁵ *ibid* principle 7.

¹³⁰⁶ *ibid* principle 4.

¹³⁰⁷ *ibid* principles 13 and 14.

¹³⁰⁸ *ibid* principle 17.

4.5.3 The 1992 Rio Declaration on Environment and Development and Agenda 21

The agreed declaration at the 1992 UN Conference on Environment and Development in Rio does not contain an express reference to renewable energy but it provides some general guidance applicable to this sector. For instance, it recommends states eliminate unsustainable patterns of production and consumption and cooperate to strengthen endogenous capacity-building for sustainable development through enhancing the development of technologies, including “new and innovative technologies”.¹³⁰⁹ Other principles of the Rio Declaration are also relevant to the development activities including

- (i) Environmental protection must be an integral part of the development process;¹³¹⁰
- (ii) States must cooperate to conserve, protect, and restore the health and integrity of Earth’s ecosystem;¹³¹¹
- (iii) States shall enact effective environmental legislation, standards, and management objectives and priorities while reflecting the environmental and development context;¹³¹²
- (iv) States shall widely apply the precautionary approach according to their capabilities.¹³¹³
- (v) Polluters should pay the costs of pollution;¹³¹⁴

¹³⁰⁹ United Nations, ‘The United Nations Conference on Environment and Development: Rio Declaration on Environment and Development’ (1992) A/CONF.151/26 (Vol. I) 31 ILM 874, principle 8 & 9.

¹³¹⁰ *ibid* principle 4.

¹³¹¹ *ibid* principle 7.

¹³¹² *ibid* principle 11.

¹³¹³ *ibid* principle 15. Chapter one of this thesis discussed the importance, limitations, relevance, and application of the precautionary principle.

¹³¹⁴ *ibid* principle 16.

(vi) EIA and approvals shall be used for activities that are likely to have a significant adverse impact on the environment;¹³¹⁵ and

(vii) Indigenous people and local communities have traditional knowledge and practices and should be supported to participate in development and environmental decision-making processes.¹³¹⁶

Agenda 21, which is a non-binding plan of action for sustainable development, also contains other principles. It advises the reliance on environmentally sound use of renewable sources of energy in helping to control GHG emissions.¹³¹⁷ However, to use clean technologies, it is necessary to adopt “preventive, precautionary, and anticipatory approaches”, ensure prior assessment of activities that might have adverse effects on the marine environments, integrate environmental protection into development processes, and internalize environmental costs through the application of the polluter pays principle.¹³¹⁸

4.5.4 United Nations Millennium Declaration

The United Nations Millennium Declaration recognizes “respect for nature” as a fundamental ethical principle driving sustainable development.¹³¹⁹ This respect must be coupled with “prudence” in managing species and resources, ensuring that actions align with sustainable development principles.¹³²⁰ The goal is to preserve the natural world for

¹³¹⁵ *ibid* principle 17.

¹³¹⁶ *ibid* principle 22.

¹³¹⁷ United Nations Sustainable Development, ‘United Nations Conference on Environment and Development’ (1992) paras 4.18(e), 9.9-9.12
<<https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>> accessed 22 August 2024.

¹³¹⁸ *ibid* para 17.22(a),(b),(c) & (d).

¹³¹⁹ United Nations General Assembly, ‘United Nations Millennium Declaration’ (2000) A/RES/55/2 ,para I.6.

¹³²⁰ *ibid*.

future generations.¹³²¹ Therefore, any activities that contribute to “unsustainable patterns of production” should be restructured to protect the long-term interests of future generations.¹³²² The commitment to respecting and preserving nature forms the foundation of ecological sustainability, providing a theoretical framework essential for shaping laws and policies related to OWE.

4.5.5 The 2002 Johannesburg Declaration

The 2002 Johannesburg Declaration calls upon governments to collaborate on sustainable development by promoting renewable energy, among others. It encourages

- (i) The development and dissemination of alternative sources of energy to give a greater share of energy mix to renewable energy,¹³²³ and
- (ii) The substantial increase in the global share of renewable energy sources to contribute to the total energy supply.¹³²⁴

Such strong statements in the Johannesburg Declaration show progressive support and greater details in other provisions related to improving access to and energy poverty eradication by renewable energy, compared to Agenda 21.¹³²⁵

4.5.6 Rio+20 and the Future We Want

The Future We Want, which is the outcome of the Rio+20 sustainable development summit, has statements on encouraging renewable energy but they have general content. For example, it recognizes that

¹³²¹ *ibid.*

¹³²² *ibid.*

¹³²³ Johannesburg Declaration on Sustainable Development in the Report of the World Summit on Sustainable Development (United Nations 2002) A/CONF.199/20, para 20(d).

¹³²⁴ *ibid* para 20(e).

¹³²⁵ Bradbrook (n 72) 122–124.

[I]mproving energy efficiency, increasing the share of renewable energy and cleaner and energy-efficient technologies are important for sustainable development, including in addressing climate change...¹³²⁶

This statement considers a range of options including renewable energy, which does not assign any priority over cleaner fossil fuel technologies.¹³²⁷

The Future We Want also provides some general environmental commitments to protect oceans. For instance, it underscores the importance of applying the ecosystem approach and precautionary approach in the management of activities that have impacts on the marine environment to maintain biodiversity for present and future generations.¹³²⁸

4.5.7 Sustainable Development Goals

The 2030 Agenda for Sustainable Development adopted by UNGA includes 17 Sustainable Development Goals (SDGs), which, among others, call for affordable clean energy. SDG7 calls for actions to ‘[e]nsure energy access to affordable, reliable, sustainable and modern energy for all’.¹³²⁹ One of the targets under this goal is to ‘increase sustainably the share of renewable energy in the global energy mix’ by 2030.¹³³⁰ Using the terms “sustainable energy” and “sustainable increase of renewable energy” in the goal and the target indicates that the development of renewable energy is qualified. This new type of energy should not be developed without considering whether it is sustainable and its impact on other goals.

¹³²⁶ The Future We Want, Outcome of the Rio+20 United Nations Conference on Sustainable Development (2012) UN Doc. A/CONF. 199/20 128.

¹³²⁷ Woolley, *Renewable Energy Law* (n 1046) 62.

¹³²⁸ The Future We Want, Outcome of the Rio+20 United Nations Conference on Sustainable Development (n 1326) 158.

¹³²⁹ UNGA (n 77).

¹³³⁰ *ibid* target 7.2.

The UN's SDGs also include goal 14 for life below water, which encourages states to 'conserve and sustainably use the oceans, seas and marine resources for sustainable development'.¹³³¹ Targets 14.1 and 14.2 of this goal are relevant to OWE development as this type of energy should be developed in a way that does not adversely affect these targets: 14.1 'By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution'; 14.2 'By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans'.¹³³²

4.6 International Organizations

4.6.1 International Renewable Energy Agency

The mandate and activities of IRENA, which was established in 2009, have been the promotion of renewable energy. Canada, which became a member of IRENA on 9 January 2019¹³³³, could align its development of OWE with IRENA's mandate and enjoy support from IRENA's activities. Under its statute, IRENA has the mandate to promote 'the widespread and increased adoption and the sustainable use of all forms of renewable energy'.¹³³⁴ The Agency must perform a wide range of activities, including analyzing, monitoring, and systematizing current renewable energy practices such as policy instruments and best practices, promoting research and development in renewable energy,

¹³³¹ UNGA (n 77).

¹³³² *ibid* targets 14.1 and 14.2.

¹³³³ 'Canada Joins International Renewable Energy Agency' (9 January 2019) <<https://www.irena.org/news/pressreleases/2019/Jan/Canada-Joins-International-Renewable-Energy-Agency>> accessed 23 August 2024.

¹³³⁴ Statute of the International Renewable Energy Agency (adopted on 26 January 2009, entered into force on 8 July 2010) 2700 UNTS 45, art II.

interacting with other governmental and non-governmental organizations, as well as advising and assisting Member States on renewable energy policies.¹³³⁵

IRENA's Medium-Term Strategy 2023-2027 also confirms that this organization focuses on increasing the share of renewable energy to help the energy transition and reduce the consequences of climate change. This strategy states

IRENA will take the leading role in accelerating the global, renewables-based energy transition to fight climate change, enhance human welfare, and drive an urgent and systemic shift for increased energy access, reduced inequalities, improved energy security, and prosperous and resilient economies and societies.¹³³⁶

Despite IRENA's mandate on "sustainable use" of renewable energy, its policy documents and continued practice focus on the promotion of renewable energy and offer little guidance on how this energy can be used sustainably.¹³³⁷ One policy document that pays attention to managing environmental impacts is the Offshore Renewables: An Action

¹³³⁵ *ibid* art IV.A.1.

¹³³⁶ IRENA, 'Report of the Director-General Medium-Term Strategy 2023-2027' (2023) 10 <https://www.irena.org/-/media/Files/IRENA/Remember/Assembly/Thirteenth-session-of-the-Assembly/A_13_4_Report-of-the-Director-General-Medium-Term-Strategy-2023-2027.pdf?rev=c8cb69f7b95849c898d4d857e1cfe749> accessed 23 August 2024.

¹³³⁷ See IRENA's policy documents: IRENA, 'World Energy Transitions Outlook: 1.5°C Pathway' (n 5); IRENA, 'Climate Change and Renewable Energy: National Policies and the Role of Communities, Cities and Regions (Report to the G20 Climate Sustainability Working Group (CSWG))' (2019) <<https://www.irena.org/publications/2019/Jun/Climate-change-and-renewable-energy>> accessed 11 July 2022; IRENA, 'NDCs in 2020: Advancing Renewables in the Power Sector and Beyond' (2019) <<https://www.irena.org/publications/2019/Dec/NDCs-in-2020>> accessed 11 July 2022; IRENA, 'IRENA's Energy Transition Support to Strengthen Climate Action' (2021) <<https://www.irena.org/publications/2021/Nov/IRENA-Energy-Transition-Support-to-Strengthen-Climate-Action>> accessed 10 July 2022; IRENA, 'Fostering a Blue Economy: Offshore Renewable Energy' (2020) <<https://www.irena.org/publications/2020/Dec/Fostering-a-blue-economy-Offshore-renewable-energy>> accessed 9 July 2022; IRENA, 'Tracking the Impacts of Innovation: Offshore Wind as a Case Study' (2021) <<https://www.irena.org/publications/2021/Jun/Impact-of-Innovation-Offshore-wind-case-study>> accessed 9 July 2022; 'Future of Wind: Deployment, Investment, Technology, Grid Integration and Socio-Economic Aspects (A Global Energy Transformation Paper)' (n 7).

Agenda for Deployment, 2021. This document provides two key tools that should be employed in ocean governance: MSP and EIA.¹³³⁸

Finally, IRENA has a facilitative role and does not have any mandate to make binding obligations for the promotion of renewable energy. IRENA lacks express or implied power to negotiate or establish legal obligations for renewable energy targets.¹³³⁹ Neither does it have any substantive power to develop any international instrument for obliging member states to use or develop renewable energy.¹³⁴⁰ Hence, it has a facilitative role by being a global center of excellence for renewable energy innovation and development, providing data and analyses on energy transition, and fostering international collaboration and targeted actions.¹³⁴¹

4.6.2 International Civil Aviation Organization

Due to the challenges that wind farms may create for aviation, safety regulations in the vicinity of aerodromes (a defined area of land or water to be used for arrival, departure, and surface movement of aircraft) should be set to mitigate the hazards to civil aircraft. The Convention on International Civil Aviation (Chicago Convention) and its Annex 14, which can be further explored in Transport Canada's regulations, set safety standards. The requirements and standards include setting certain obstacle restrictions, equipping wind farm turbines with lights or marking them in case of creating potential obstacles for

¹³³⁸ IRENA, 'Offshore Renewables: An Action Agenda for Deployment' (2021) 73–77 <<https://www.irena.org/publications/2021/Jul/Offshore-Renewables-An-Action-Agenda-for-Deployment>> accessed 8 July 2022.

¹³³⁹ Bruce (n 72) 45.

¹³⁴⁰ Johannes Urpelainen and Thijs Van De Graaf, 'The International Renewable Energy Agency: A Success Story in Institutional Innovation?' (2015) 15 *International Environmental Agreements: Politics, Law and Economics* 162–171.

¹³⁴¹ IRENA, 'Report of the Director-General Medium-Term Strategy 2023-2027' (n 1336) 11.

aviation, using certain types of marking and lighting, and painting certain upper parts of turbines with white color.¹³⁴²

4.6.3 International Maritime Organization

As stated in the relevant subsection on regulating passage for the construction of OWE, IMO is the only organization that sets guidelines for ship routing systems. For example, countries must consider ship routing systems, traffic separation schemes, and the Guidelines for Safety Zones and Safety of Navigation around Offshore Installations and Structures, 1989, which can be explored further in Canadian regulation.¹³⁴³

Concerning the noise generated by commercial shipping including those providing services for the construction of offshore wind farms, IMO has set guidelines. The Revised Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address

¹³⁴² Convention on International Civil Aviation (adopted 7 December 1944, entered into force 4 April 1947) 15 UNTS 295 Annex 14, art 6.4.2 <https://www.iaacm.gov.mz/app/uploads/2018/12/an_14_v1_Aerodromes_8ed.2018_rev.14_01.07.18.pdf> accessed 23 August 2024; Canadian Aviation Regulations, SOR/96-433 ss 601.23 and 601.24; Transport Canada, ‘Standard 621 - Obstacle Marking and Lighting - Canadian Aviation Regulations (CARs)’ (AARBH 2025) <<https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/standards/standard-621-obstacle-marking-lighting-canadian-aviation-regulations-cars>> accessed 24 February 2025; Transport Canada, ‘Advisory Circular (AC) No. 601-001’ (AARAC 2018) <<https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-601-001>> accessed 24 February 2025; Transport Canada, ‘Exemption from Section 12.5 of Standard 621 – Chapter 12 – Marking and Lighting of Wind Turbines and Wind Farms and Paragraph 601.24(2)(a) of the Canadian Aviation Regulations’ (2019) <<https://tc.canada.ca/en/aviation/reference-centre/exemptions-canadian-aviation-regulations-cars/exemption-section-125-standard-621-chapter-12-marking-lighting-wind-turbines-wind-farms-paragraph-601242a-canadian-aviation-regulations>> accessed 24 February 2025. These regulations from Transport Canada outline the marking and lighting of obstacles, including marking and lighting of wind turbines.

¹³⁴³ The IMO Resolution No. 671(16) on Safety Zones and Safety of Navigation Around Offshore Installations and Structures (n 1017) para 1(a); ‘Navigation Safety Regulations’ SOR/2020-216; ‘Canada Gazette, Part 1, Volume 158, Number 22: Vessel Traffic Services Zones Regulations’ (Government of Canada, Public Works and Government Services Canada, Integrated Services Branch, Canada Gazette 2024) <https://canadagazette.gc.ca/rp-pr/p1/2024/2024-06-01/html/reg5-eng.html?utm_source=chatgpt.com> accessed 24 February 2025; Government of Canada, ‘Canada Gazette, Part 1, Volume 158, Number 8’ (n 848). These Canadian regulations ensure safe marine navigation by requiring proper voyage planning and communication systems on larger vessels, mandating reporting requirements for vessels entering Vessel Traffic Services zones, and requiring compatibility of navigational safety with established routing systems.

Adverse Impacts on Marine Life, 2023, generally provides advice on approaches to reduce underwater radiated noise (URN) and assists stakeholders in establishing mechanisms and programs whereby noise reduction measures can be realized.¹³⁴⁴ URN Management Planning includes establishing a baseline of a ship’s URN and setting URN targets.¹³⁴⁵ URN reduction approaches include optimizing/modifying ship hull and propeller design, using emerging technologies like wind-assist technologies, and use of “ship routing measures”, which is moving away from national and international designated areas (e.g. marine mammal habitats or migratory pathways).¹³⁴⁶

4.6.4 International Energy Agency

The International Energy Agency (IEA) plays a critical role in advancing the development of OWE.¹³⁴⁷ It promotes the use of clean technologies to achieve the global target of reduction in GHG emissions, energy security and sustainability. OWE is part of the IEA’s strategy for the low-carbon energy sector. IEA has also contributed to policy research, reports, market analysis, technology innovation, collaboration, and knowledge sharing on OWE. For example, “Offshore Wind Outlook 2019” provides extensive analysis of OWE advancements, related policy recommendations, market trends, and its significant possibility to contribute to energy transition.¹³⁴⁸ In addition, IEA has produced “The Future

¹³⁴⁴ IMO, ‘Revised Guidelines for the Reduction of Underwater Radiated Noise from Shipping to Address Adverse Impacts on Marine Life’ (2023) MEPC.1/Circ.906.

¹³⁴⁵ *ibid* 4.

¹³⁴⁶ *ibid* 5–9.

¹³⁴⁷ IEA, ‘IEA Members’ <https://energy.ec.europa.eu/topics/international-cooperation/international-organisations-and-initiatives/international-energy-agency_en> accessed 20 February 2025. According to this reference, Canada is a member of the IEA.

¹³⁴⁸ IEA, ‘Offshore Wind Outlook 2019: World Energy Outlook Special Report’ (2019) <https://iea.blob.core.windows.net/assets/495ab264-4ddf-4b68-b9c0-514295ff40a7/Offshore_Wind_Outlook_2019.pdf> accessed 20 February 2025.

of Offshore Wind” to explain the potential contributions of OWE, its economic benefits, and strategies to promote its deployment and overcome its challenges.¹³⁴⁹ Furthermore, “Net Zero by 2050: A Roadmap for the Global Energy Sector” reports the pathways to achieve global net-zero emissions by 2050 and calls for scaling up wind energy as a cost-effective solution to support worldwide decarbonization objectives.¹³⁵⁰ Finally, “Renewables 2023: Analysis and Forecast to 2028” presents trends in renewable energy markets, including OWE, and provides a forecast of deployment in different regions and the associated challenges and opportunities.¹³⁵¹

4.6.5 Organization for Economic Co-operation and Development

The Organization for Economic Co-operation and Development (OECD)¹³⁵² has adopted various initiatives for low-carbon energy transition including conducting research and data analysis, promoting clean energy transition, adopting policy guidelines, and fostering international collaboration. OECD’s overall strategy is to promote clean energy transition and advocate policies that facilitate renewable energy growth through appropriate regulatory frameworks, financial incentives, and stimulating investment.¹³⁵³ OECD has also provided recommendations on how countries can facilitate energy

¹³⁴⁹ IEA, ‘Energy Technology Perspectives 2020’ [2020] Energy Technology Perspectives <https://iea.blob.core.windows.net/assets/7f8aed40-89af-4348-be19-c8a67df0b9ea/Energy_Technology_Perspectives_2020_PDF.pdf> accessed 20 February 2025.

¹³⁵⁰ IEA, ‘Net Zero by 2050: A Roadmap for the Global Energy Sector’ (2021) <https://iea.blob.core.windows.net/assets/7ebafc81-74ed-412b-9c60-5cc32c8396e4/NetZeroby2050-ARoadmapfortheGlobalEnergySector-SummaryforPolicyMakers_CORR.pdf> accessed 20 February 2025.

¹³⁵¹ IEA, ‘Renewables 2023: Analysis and Forecast to 2028’ <https://iea.blob.core.windows.net/assets/96d66a8b-d502-476b-ba94-54ffda84cf72/Renewables_2023.pdf> accessed 20 February 2025.

¹³⁵² OECD, ‘Members and Partners’ (*OECD*) <<https://www.oecd.org/en/about/members-partners.html>> accessed 20 February 2025. According to this reference, Canada is a member of OECD.

¹³⁵³ OECD, ‘Towards Green Growth’ (OECD Publishing 2011) <https://www.oecd.org/en/publications/towards-green-growth_9789264111318-en.html> accessed 20 February 2025.

transition through climate policies, scaling up low-carbon investment and finance, taxation practices, and removing trade barriers.¹³⁵⁴ Using OECD's recommendations and guidelines could help the development of climate policies for OWE in Canada.

4.7 Conclusion

International law and policy offer a wealth of regulations, recommendations, best practices, and guidelines that support the regulatory framework for OWE in Canada. Some conventions establish general environmental obligations aimed at protecting and preserving the environment. In contrast, others, such as CBD and resolutions from the Conference of the Parties under different Conventions or regional agreements can serve as strong foundations and valuable resources.

These sources can guide the development of the OWE framework by emphasizing key concepts and principles, including ecological sustainability, the precautionary principle, the ecosystem approach, and adaptive management. Additionally, they provide practical solutions and recommendations for adequate processes related to EIA, SEA, and MSP, as well as the mitigation measures that should be adopted during the planning, construction, and operational phases of offshore wind energy projects.

Based on the discussions in this chapter, the following table summarizes the high-level requirements and recommendations that can be derived from international law and policy.

¹³⁵⁴ OECD/IEA/NEA/ITF, 'Aligning Policies for a Low-Carbon Economy' (OECD Publishing 2015) <https://www.oecd.org/en/publications/aligning-policies-for-a-low-carbon-economy_9789264233294-en.html> accessed 20 February 2025.

Table 3- Conventions, Regional Agreements, and Policies and their Applications, Requirements, and/or Recommendations

Conventions/ International Agreements/ Policies	Is Canada a party?	Applications/Requirements/Recommendations
The United Nations Convention on the Law of the Sea	Yes	<p>Sovereignty in internal waters, and sovereign rights in the territorial sea, EEZ and the continental shelf to permit OWE</p> <p>Limitations: the right of innocent passage in the territorial sea</p> <p>Considering other matters: The right of Canada to pass safety and environmental regulations, compliance with IMO’s conventions concerning the safety of navigation/the prevention of collisions at sea, compliance with rules related to the established designated sea lanes and traffic separation schemes, creation of a safety zone of no more than 500 meters for installations and structures, respect the laws and regulations of Canada concerning marine pollution</p> <p>Obligations: The duty to i) Protect and preserve the marine environment, ii) Prevent, reduce, and control marine pollution of the marine environment from the use of technologies, iii) Take measures necessary for the protection and preservation of “rare or fragile ecosystems” and “the habitat of depleted, threatened or endangered species and other forms of marine life”, and iv) Undertake EIA.</p>
United Nations Framework Convention on Climate Change, Kyoto Protocol, and Paris Agreement	Yes, but Canada withdrew from the Kyoto Protocol in 2011	<p>Commitment to i) Contributing to the objective of the Convention, which is to stabilize the concentration of GHG in the atmosphere, prevent the adverse effects of interference with the climate system, ii) Taking the lead in combatting climate change, iii) Adopting policies and taking measures to reduce GHG emissions</p> <p>OWE: it’s an option; but no obligation to select this option to fulfill obligations under the UNFCCC</p>

Convention on Biological Diversity	Yes	<p>Requirements under CBD: The consistency of the Parties’ policies and plans with the objectives of the CBD, Using EIA</p> <p>Some recommendations of COPs: Adopting an ecosystem approach, being “all-inclusive” in terms of considering all scientific and traditional information as well as involving all social actors and disciplines, promoting the participation of stakeholders and effective engagement of Indigenous people and communities, adopting adaptive management, using MSP, reducing the loss of areas of high biodiversity importance, reducing the impacts of invasive alien species on biodiversity, reducing pollution risk, adopting COP’s Guidelines on SEA and EIA, taking appropriate measures to avoid, minimize, and mitigate the potentially significant impacts of noise on marine and coastal biodiversity, and taking appropriate actions and policies to prevent and mitigate the potential adverse impacts of marine debris on marine and coastal biodiversity and habitats</p>
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	No	<p>Protecting migratory species by listing and maintaining the migratory species and their habitat on a long-term basis</p> <p>Some key recommendations of COPs: identifying areas where migratory species are vulnerable to the development of wind turbines, taking the precautionary principle, considering the results of impact assessments and monitoring, and taking appropriate measures to prevent or reduce the impacts of renewable energy or wind turbines on wildlife animals</p>
Convention on Wetlands of International Importance, especially as Waterfowl Habitat	Yes	<p>Conservation of wetlands and waterfowl by adopting and implementing plans, establishing nature reserves on wetlands, and promoting the increase in the population of waterfowl, In cases where an “urgent national interest” is involved, any loss of wetland resources must be compensated or an additional nature reserve for waterfowl is created.</p> <p>Some recommendations of COPs: applying COP’s guidance on the EIA and SEA and adopting the precautionary approach</p>

International Convention for the Regulation of Whaling	No	Some IWC’s recommendations: taking the precautionary principle for anthropogenic underwater noise, taking appropriate mitigation measures, such as establishing noise registers and monitoring programs
Convention on the Protection of the Underwater Cultural Heritage	No	Establishing national regulations for authorizing activities that may incidentally affect cultural and historical sites including by setting approvals and excluding these sites from activities or finding solutions that mitigate impacts
The International Convention for the Prevention of Pollution from Ships (MARPOL)	Yes	Setting limits for preventing pollution caused by ships, whether operational or accidental, such as oil, sewage, garbage, and air emissions.
Convention on Environmental Impact Assessment in a Transboundary Context (ESPOO) and its Protocol	Canada is a party to the Convention, but not the Protocol on SEA	Requiring EIA for projects that may have a significant adverse transboundary impact, notifying and consulting with the affected Parties as well as engaging the public Protocol: Requiring SEA for plans, programs, and projects such as OWE
Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS)	No	Some ACCOBAMS Meeting of the Parties’ Recommendations: Using impact assessments and adopting mitigation measures such as setting limits to underwater noise, using quieter technologies, applying BEP and BAT, defining buffer zones around marine mammals’ habitats and establishing “safe, precautionary, and scientifically-based exclusion zones” around noise sources, developing “noise hotspot maps” and “quiet zones, modelling the sound, monitoring noise, and dedicating watch to ensure mammals are not present
Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBAMS)	No	Some ASCOBANS Meetings of the Parties’ Recommendations: Using EIA and SEA, adopting BAT and BEP, developing adaptive measures, ensuring appropriate baseline assessments of habitat use before activities, and using MSP

Agreement on the Conservation of African-Eurasian Migratory Waterbirds	No	AEWA Meeting of the Parties’ Recommendations: Undertaking SEA and EIA, assessing cumulative effects, avoiding, minimizing, and mitigating the impacts on waterbirds, compensating for loss, and monitoring the effects and considering the lessons learned
Agreement on the Conservation of Populations of European Bats	No	EUROBATS Meeting of the Parties’ recommendations: conducting an assessment of impacts on bats and avoiding or reducing such impacts
Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)	No	The OSPAR Commission’s recommendations: Selecting wind farms outside migratory routes and avoiding sensitive and ecologically valuable areas
Stockholm Declaration	NA	Promoting the fundamental right to an environment of quality, effective integrated and coordinated management, and environmental stewardship
The 1992 Rio Declaration on Environment and Development and Agenda 21	NA	Adopting principles or recommendations including integration of environmental protection into decision-making processes, protecting the health and integrity of ecosystems, effective environmental regulations, the precautionary approach, and polluter pays principle
United Nations Millennium Declaration	NA	Recognizing “respect for nature”, ensuring prudent management of resources, and avoiding unsustainable patterns of production
The 2002 Johannesburg Declaration	NA	Increasing the share of renewable energy in the global energy supply
Rio+20 and the Future We Want	NA	Increasing the share of renewable energy and applying the ecosystem approach and precautionary approach in the management of activities

Sustainable Development Goals	NA	Increasing the share of renewable energy in the global energy mix by 2030 as well as preventing and reducing marine pollution of all kinds by 2025, and managing and protecting marine and coastal ecosystems
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Table 4- International Organizations and their Applications and/or Recommendations

International Organization	Is Canada a member?	Applications and/or Recommendations
International Renewable Energy Agency	Yes	Promoting and increasing the sustainable use of all forms of renewable energy Activities: analyzing, monitoring, and systematizing current renewable energy practices such as policy instruments and best practices
International Civil Aviation Organization	Yes	Setting safety standards
International Maritime Organization	Yes	Setting guidelines for ship routing systems and safety guidelines
International Energy Agency	Yes	Advancing policy research, reports, market analysis, technology innovation, collaboration, and knowledge sharing on OWE
Organization for Economic Co-operation and Development	Yes	Promoting clean energy transition and advocating policies that facilitate renewable energy growth through proposing policies

CHAPTER FIVE- OFFSHORE WIND ENERGY AND EMERGING PRACTICES IN THE LEADING EUROPEAN COUNTRIES: WHAT LESSONS CAN BE LEARNED FOR CANADA?

Europe is the largest producer of OWE in the world. Its cumulative OWE capacity reached 34 gigawatts by the end of 2023.¹³⁵⁵ EU countries have also agreed on ambitious and long-term goals to develop offshore renewable energy, which include OWE. They agreed to install around 111 GW of offshore renewable generation by 2030 and this target will rise by 317 GW by 2050.¹³⁵⁶

This chapter reviews the laws and policies related to OWE from three selected countries that have developed OWE for at least two decades: the UK, Germany, and Denmark. After discussing the selection criteria, the chapter examines the OWE regulatory framework of each of these three jurisdictions. But before delving into national laws, reviewing the EU legal framework related to the energy sector and the environment is important because, first, the related EU law and policy includes directives that the Member States of the EU must follow and incorporate into their national regulations. Second, there are references to the content of the EU directives (e.g. directives related to birds, habitats, and Natura 2000) in national laws and regulations reviewed in this chapter, making it necessary to understand the directives and how OWE fits into the national and EU laws and policies.

¹³⁵⁵ ‘Europe: Cumulative Offshore Wind Capacity 2023’ (*Statista*)
<<https://www.statista.com/statistics/271055/cumulative-european-offshore-wind-power-capacity-installations/>> accessed 26 August 2024.

¹³⁵⁶ ‘Member States Agree New Ambition for Expanding Offshore Renewable Energy’
<https://energy.ec.europa.eu/news/member-states-agree-new-ambition-expanding-offshore-renewable-energy-2023-01-19_en> accessed 26 August 2024.

5.1 The EU Legal Framework for the Energy Sector and the Environment

The Treaty on the Functioning of the European Union (the TFEU) considers various goals and principles that apply to the energy sector and environmental protection. Article 194(1) of the TFEU provides that the Union Policy aims to ensure the functioning of the energy market, the security of energy supply, the promotion of energy efficiency, and the promotion of interconnection of energy networks.¹³⁵⁷ Preservation, protection, and improvement of the quality of the environment are also among the objectives of the Union.¹³⁵⁸ The TFEU further provides that environmental protection requirements must be integrated into the definitions and implementation of policies and activities to promote sustainable development.¹³⁵⁹ The Union policy is also based on the precautionary, preventive, and “the polluter should pay” principles.¹³⁶⁰

These Union policy goals have been pursued by directives. The EU directives are legislative and binding acts that require Member States to achieve certain goals, although the member states are free to decide how to achieve them by devising their forms and means of implementation. The TFEU recognizes ‘a Member State’s right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply’.¹³⁶¹ The most relevant directives that form the legal framework within which OWE projects should develop are chronologically discussed below.

¹³⁵⁷ Treaty on the Functioning of the European Union of 13 December 2007, consolidated version [2016] O.J C326/47, art 194 (1).

¹³⁵⁸ *ibid* art 191 (ex art 174 TEC).

¹³⁵⁹ *ibid* art 11 (ex art 6 TEC).

¹³⁶⁰ *ibid* art 191(2).

¹³⁶¹ *ibid* art 194 (2).

5.1.1 The 1992 Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)¹³⁶²

This Directive aims to contribute to biodiversity conservation by protecting wild fauna, flora, and natural habitats.¹³⁶³ To achieve this goal, Member States must take measures to maintain or restore them to favourable conservation status.¹³⁶⁴ Member States must also establish the Natura 2000, which is a network of special areas of conservation, including special protected areas, based on the annex of this Directive.¹³⁶⁵ Sites of Community importance, which contribute to maintaining or restoring the status of natural habitats or species or to the coherence of Natura 2000, can be adopted.¹³⁶⁶ Under the Habitats Directive, all forms of killing species, the deliberate disturbance of species, and deterioration or destruction of breeding sites or resting places are prohibited.¹³⁶⁷ Derogation from this rule is permitted if there is no satisfactory alternative, and derogation is not detrimental to the maintenance of the population of the species.¹³⁶⁸ Such derogation must be for acceptable reasons identified under the Habitats Directive including

[I]n the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.¹³⁶⁹

¹³⁶² Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (n 280).

¹³⁶³ *ibid* art 2(1).

¹³⁶⁴ *ibid* art 2(2).

¹³⁶⁵ *ibid* arts 3(1) and 3(2).

¹³⁶⁶ *ibid* arts 1(k) and 4(2).

¹³⁶⁷ *ibid* art 12.

¹³⁶⁸ *ibid* art 16(1).

¹³⁶⁹ *ibid* art 16(1)(c).

This Directive is relevant to OWE because, as will be discussed under national laws and policies, one of the main concerns about the development of offshore wind farms is their impact on the Natura 2000. The OWE development must not compromise the objectives set for the conservation of the Natura 2000.

5.1.2 The 2001 Directive on the Assessment of the Effects of Certain Plans and Programs on the Environment (the Strategic Environmental Assessment Directive)¹³⁷⁰

The Strategic Environmental Assessment Directive sets out directions for Member States on how to examine plans and programs strategically to achieve sustainability. This Directive aims to ensure that SEA is conducted for plans and programs that may have significant environmental effects on the environment before their adoption or submission to legislative procedure.¹³⁷¹ This tool integrates environmental considerations into the preparation and adoption of plans and programs and promotes sustainable development.¹³⁷²

One of the areas that are covered by SEA is for plans and programs prepared for energy.¹³⁷³ Member States must determine whether energy plans or programs (which could include those related to OWE) are likely to have significant environmental effects. Annex II of the Strategic Environmental Assessment Directive offers guidance for determining the likely significance of effects. Firstly, the characteristics of plans or programs should be explored by examining

¹³⁷⁰ Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the Assessment of the Effects of Certain Plans and Programmes on the Environment, [2001] OJ L 197/30.

¹³⁷¹ *ibid* arts 1 and 4.

¹³⁷² *ibid* art 1.

¹³⁷³ *ibid* art 3(2).

- The framework of the plan or program for projects and activities by looking into the location, nature, size, and operating conditions, and the required resources;
- The influence of the plan or program on other plans and programs;
- The relevance of the plan or program to the integration of environmental considerations and sustainable development;
- The relevant environmental problems of the plan or program;
- The relevance of the plan or program to environmental plans and programs (e.g. water protection).

Secondly, the characteristics of the effects and the likely affected areas should be explored by examining:

- Different aspects of the effects such as probability, duration, frequency, and reversibility of the effects;
- The cumulative effects;
- The transboundary effects;
- Risks to human health or the environment;
- The magnitude and spatial dimensions of the effects;
- The value and vulnerability of the likely affected areas;
- How the plan and program may exceed the environmental standards or limits;
- The effects on protected areas.¹³⁷⁴

¹³⁷⁴ *ibid* Annex II.

5.1.3 The 2000 Directive Establishing a Framework for Community Action in the Field of Water Policy” (the Water Framework Directive)¹³⁷⁵

The Water Framework Directive establishes a framework for the protection of water. This Directive applies to waters including inland surface waters, coastal waters, groundwater, and transitional waters such as the North Atlantic Ocean, North Sea, Baltic Sea, Mediterranean Sea, Barents Sea, and Norwegian Sea.¹³⁷⁶ The purpose of the Directive is to prevent further deterioration of the status of bodies of water and enhance the protection of the aquatic environment through various measures including progressive reduction of discharges, emissions, and losses of priority substances.¹³⁷⁷ The Directive also sets environmental objectives for surface waters, groundwater, and protected areas.¹³⁷⁸ Therefore, based on this Directive, deterioration of the status of the water body must be prevented, and the objectives of the water body must not be compromised, prevented, or undermined.

This Directive is relevant to OWE projects as these projects may introduce wastes and substances into water that may reduce the quality of water. The introduction of wastes and substances should not be at a level that undermines the environmental objectives set for the conservation of the quality of water.

¹³⁷⁵ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy, [2000] OJ L 327/1.

¹³⁷⁶ *ibid* art 1 and Annex II.

¹³⁷⁷ *ibid* art 1(a) and (c).

¹³⁷⁸ *ibid* art 4.

5.1.4 The 2008 Directive Establishing a Framework for Community Action in the Field of Marine Environmental Policy (the Marine Strategy Framework Directive)¹³⁷⁹

The Marine Strategy Framework Directive establishes a framework that requires Member States to take necessary actions to “achieve or maintain good environmental status in the marine environment”.¹³⁸⁰ Good environmental status is defined as ‘the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations’.¹³⁸¹ Ecosystems should function well and maintain their resilience and anthropogenic inputs of substance and energy, including underwater noise, should not cause pollution.¹³⁸² This Directive specifically gives priority to achieving good environmental status in the management of human activities and notes:

By applying an ecosystem-based approach to the management of human activities while enabling a sustainable use of marine goods and services, priority should be given to achieving or maintaining good environmental status in the Community’s marine environment, to continuing its protection and preservation, and to preventing subsequent deterioration.¹³⁸³

¹³⁷⁹ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 Establishing a Framework for Community Action in the Field of Marine Environmental Policy (Marine Strategy Framework Directive), [2008] OJ L 164/19.

¹³⁸⁰ *ibid* art 1.

¹³⁸¹ *ibid* art 3(5).

¹³⁸² *ibid* art 3(5)(a) & (b).

¹³⁸³ *ibid* preamble para 8.

Under this Directive, the Member States must initially assess their marine waters, determine a set of good environmental status based on certain qualitative descriptors listed in the annex of the Directive, establish a set of environmental targets, apply adaptive management based on the ecosystem approach, and monitor them to achieve or maintain good environmental status in the marine environment.¹³⁸⁴

This Directive is relevant to the context of OWE in various ways. First, restoring the marine environment and maintaining its health, productivity, and functioning is the overarching objective of ecological sustainability, which should not be compromised as a result of OWE impacts. Second, assessing the environmental status or baseline conditions of the marine environment, using qualitative descriptors, before proceeding with OWE development is key. Such assessment helps with understanding whether the marine environment is in good environmental status. In other words, the ecological integrity of ecosystems necessitates evaluating whether they have the capacity to absorb shocks from the impacts of OWE.

5.1.5 The 2009 Directive on the Conservation of Wild Birds (The Birds Directive)¹³⁸⁵

The Birds Directive aims to ensure the conservation, protection, management, and control of all species of naturally occurring birds in the wild state in Europe and the territory of Member States.¹³⁸⁶ Member States must take necessary measures to protect birds, including by prohibiting “deliberate killing or capture by any method”, “deliberate

¹³⁸⁴ *ibid* arts 4, 8, 9, 10 and 11.

¹³⁸⁵ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds, [2009] OJ L 20/7.

¹³⁸⁶ *ibid* art 1.

destruction of, or damage to, their nests and eggs or removal of their nests”, and “deliberate disturbance of these birds”.¹³⁸⁷ This prohibition can be derogated based on a permit under “strictly supervised conditions” and “in small numbers”.¹³⁸⁸ Such derogation must also specify the species, the authorized means or arrangement of capture or killing, the conditions, time, and place in which such derogation may be granted, the authority requiring conditions of such permit, and the control employed.¹³⁸⁹

As discussed in chapter two of this thesis, collision, disturbance, or displacement of birds are serious concerns related to OWE development. This Directive prohibits OWE activities leading to killing birds or destruction of or damaging to their nests unless a permit is obtained (for further discussions on the interpretations of “deliberate” killing, see section 5.4.2). This permit, however, must set strict monitoring requirements, and the overall number of killings as a result of OWE activity must be small.

5.1.6 The 2009 Renewable Energy Directive¹³⁹⁰ and 2018 Renewable Energy Directive¹³⁹¹

The 2009 Renewable Energy Directive set national binding targets on Member States to achieve increases in renewable energy consumption. The most important obligation of each Member State until 2020 was to add up to 20 percent share of renewable energy for the EU as a whole, which was shared between the Member States based on

¹³⁸⁷ *ibid* art 5.

¹³⁸⁸ *ibid* art 9(1)(c).

¹³⁸⁹ *ibid* art 9(2).

¹³⁹⁰ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources and Amending and Subsequently Repealing Directives 2001/77/EC and 2003/30/EC, [2009] OJ L 140/16.

¹³⁹¹ Directive (EU) 2018/2001 of the European Parliament and of The Council of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources, [2018] OJ L 328/82.

various factors.¹³⁹² However, the 2018 Renewable Energy Directive took a different approach to respond to competitive energy markets and the affordability of energy for customers.¹³⁹³ Hence, this Directive sets a new target of 32 percent of energy from renewable sources in the overall energy consumption by 2030.¹³⁹⁴ The key difference between this Directive and the 2009 Renewable Energy Directive is that this new Directive does not have mandatory and legally binding targets on Member States at the EU level but it sets national contributions to achieve the target collectively.¹³⁹⁵

5.1.7 The 2011 Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment and the 2014 Amendment (Environmental Impact Assessment Directive)

Member States must take measures to ensure that when a development (e.g. OWE) may have significant effects on the environment, the development consent is made subject to prior environmental assessment.¹³⁹⁶ OWE projects are not considered projects that automatically require EIA. Such projects are among other projects listed in Annex II of the Directive that the Member States can determine whether the project is subject to an assessment through case-by-case examination and/or determination based on thresholds or criteria.¹³⁹⁷ For determination, they consider the selection criteria set out in Annex III of

¹³⁹² Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources and Amending and Subsequently Repealing Directives 2001/77/EC and 2003/30/EC (n 1390) art 3(1); Woolley, *Renewable Energy Law* (n 1046) 85.

¹³⁹³ Woolley, *Renewable Energy Law* (n 1046) 89.

¹³⁹⁴ Directive (EU) 2018/2001 of the European Parliament and of The Council of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources (n 1391) art 3(1).

¹³⁹⁵ *ibid* art 3(1) and 3(2); Woolley, *Renewable Energy Law* (n 1046) 90.

¹³⁹⁶ Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 Amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment and Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the Assessment of the Effects of Certain Public and Private Projects on the Environment, [2014] OJ L 124/1 (amending directive) and [2011] OJ L 26/1, art 2(1).

¹³⁹⁷ *ibid* art 4(2) and Annex II(3)(i).

the Directive, including the size, the cumulation with other projects, the use of natural resources, the production of waste, pollution, the risk of accident, the environmental geographical areas/protected areas to be affected, the environmental capacity for absorption of effects, environmental quality standards, landscapes of significance, the nature, magnitude, probability, duration, frequency, complexity, and reversibility of effects.¹³⁹⁸

5.1.8 The 2014 Directive “Establishing a Framework for Maritime Spatial Planning” (the MSP Directive)¹³⁹⁹

The MSP Directive established a framework for MSP to ensure the sustainability of marine economies, marine uses, and use of marine resources.¹⁴⁰⁰ The Directive defines maritime spatial planning as ‘a process by which the relevant Member State’s authorities analyze and organize human activities in marine areas to achieve ecological, economic, and social objectives’.¹⁴⁰¹ The MSP framework under this Directive is adopted because of the high demand for using marine areas for different purposes such as oil and gas exploitation, shipping, aquaculture, tourism, and production of energy from renewable sources, which need an integrated planning and management approach.¹⁴⁰² MSP is considered a cross-cutting tool to apply this approach to effectively manage marine activities and sustainably use marine resources.¹⁴⁰³ MSP should also ensure that all activities are compatible with the requirement to achieve “good environmental status” and

¹³⁹⁸ *ibid* Annex III.

¹³⁹⁹ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 Establishing a Framework for Maritime Spatial Planning, [2014] OJ L 257/135.

¹⁴⁰⁰ *ibid* art 1.

¹⁴⁰¹ *ibid* art 3(2).

¹⁴⁰² *ibid* para 1 preamble.

¹⁴⁰³ *ibid* paras 3 and 9 preamble.

that the capacity of ecosystems is not compromised.¹⁴⁰⁴ Furthermore, an ecosystem approach should be adopted to consider the characteristics of the specific marine region while taking adaptive management to learn from experience, knowledge, and data acquired over time.¹⁴⁰⁵ Based on these premises, each Member State must establish and implement MSP.¹⁴⁰⁶ Nonetheless, the Member States are not completely free to decide on how to establish MSP, but they must consider the following minimum requirements: land-sea interactions, environmental, social, economic, and safety aspects, promoting coherence between MSP and other plans or integrated coastal management, involvement of stakeholders, use of best available data, ensuring transboundary cooperation, and promoting cooperations with third countries.¹⁴⁰⁷

5.2 The Regulatory Framework of Offshore Wind Energy in the Leading European Countries

5.2.1 Selection Criteria

This thesis selects the UK, Germany, and Denmark as examples of countries that have previous experience in the development of OWE and developed MSP. For example, the UK is a world leader in OWE. Its first offshore wind farm was constructed in 2000 off the Northumberland coast with 2 MW wind turbines, which were at the time the largest turbines in the world.¹⁴⁰⁸ The UK's first commercial wind farm named North Hoyle was

¹⁴⁰⁴ *ibid* para 14 preamble.

¹⁴⁰⁵ *ibid* para 14 preamble, arts 4(4) and 5(2).

¹⁴⁰⁶ *ibid* art 4(1).

¹⁴⁰⁷ *ibid* art 6(2).

¹⁴⁰⁸ Catapult Offshore Renewable Energy, 'UK Offshore Wind History' <<https://guidetoanoffshorewindfarm.com/offshore-wind-history>> accessed 13 January 2023.

installed off the North Wales coast and consisted of thirty 2MW turbines in 2003.¹⁴⁰⁹ Gradually, the UK has developed OWE throughout the last few decades by attracting investment and reforming its regulatory framework. The CATAPULT graph below shows the progress of capacity installed per year (Figure 6).¹⁴¹⁰ The UK developed its regulatory framework to expand the development of OWE. The bureaucratic and fragmented system of management of the sea and the ambitious targets for decarbonization brought about a need to design an integrated, centralized, and streamlined management system in the UK.¹⁴¹¹ For instance, one of the challenges was that there were delays in the consenting process for the development of Rounds One and Two of offshore wind farms in 2000 and 2003.¹⁴¹² In addition, one of the main factors that contributed to a shift towards designing MSP was a need to promote offshore renewable energy.¹⁴¹³ To address these challenges, achieve other objectives like sustainable development, and strike a balance between economic, social, and environmental considerations, the UK's marine planning was introduced for the UK marine area by changing statutes related to marine policies.

¹⁴⁰⁹ *ibid.*

¹⁴¹⁰ *ibid.*

¹⁴¹¹ Gavin Scarff, Clare Fitzsimmons and Tim Gray, 'The New Mode of Marine Planning in the UK: Aspirations and Challenges' (2015) 51 *Marine Policy* 96 <<https://linkinghub.elsevier.com/retrieve/pii/S0308597X14002000>> accessed 5 May 2021.

¹⁴¹² Emma Gibson and Peter Howsam, 'The Legal Framework for Offshore Wind Farms: A Critical Analysis of the Consents Process' [2010] *Energy Policy* 4692.

¹⁴¹³ Scarff, Fitzsimmons and Gray (n 1411) 96.

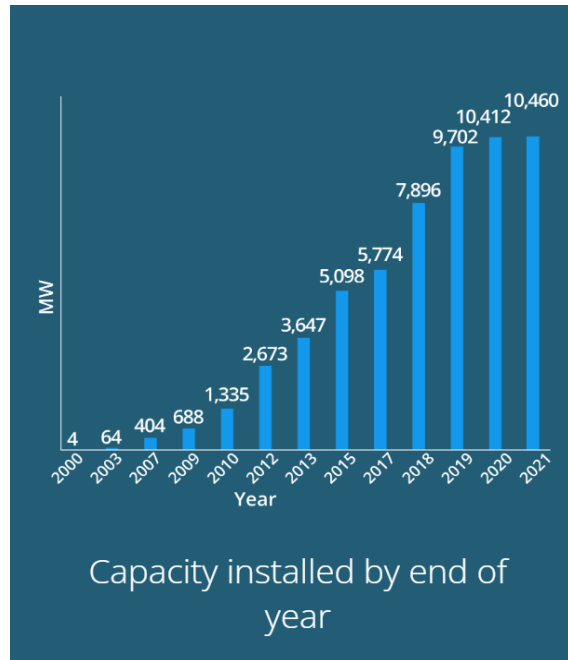


Figure 6

After the UK, Germany is the country that has had the most success in the development of OWE. Germany started the installation of the first wind farm in 2009 and as of 2022, it has installed around 1500 turbines with a capacity of 7.8 GW in German waters of the North Sea and Baltic Sea. The government has set an ambitious target of 30GW by 2030.¹⁴¹⁴ OWE in Germany is regulated by various acts and standards that will be discussed in the relevant subsection below. The effectiveness of German MSP in the preservation of the environment was subject to debate between different groups.¹⁴¹⁵ Reviewing these regulatory experiences is insightful.

¹⁴¹⁴ Clean Energy Wire, ‘German Offshore Wind Power - Output, Business and Perspectives’ <<https://www.cleanenergywire.org/factsheets/german-offshore-wind-power-output-business-and-perspectives>> accessed 13 January 2023.

¹⁴¹⁵ ‘Balancing Germany’s Offshore Wind Expansion with Environmental Protection | Energy Transition’ <<https://energytransition.org/2022/06/balancing-germanys-offshore-wind-expansion-with-environmental-protection/>> accessed 14 January 2023.

Following Germany, Denmark is the country with the most significant OWE installed capacity in Europe. Denmark was the first country that pursued the possibility of developing wind energy after the 1973 oil crisis and it was able to install the first commercial turbine in 1979.¹⁴¹⁶ The world's first offshore wind farm was constructed off the coast of Vindeby in Danish waters in 1991.¹⁴¹⁷ Denmark currently has 2.7 GW installed offshore wind capacity, and the Danish government has set a target to add 4 GW to increase the target for 2030 from 8.9 GW to 12.9 GW.¹⁴¹⁸ The Danish parliament passed the Maritime Spatial Planning Act in 2016, which aims to promote economic growth and the development of marine uses sustainably as well as to contribute to achieving the goals of MSP.¹⁴¹⁹ This thesis will review the Danish experience in OWE, its regulatory regime, MSP, and impact assessments in the relevant subsection below.

As noted above, the second reason for the selection is that each country has MSP or integrated management plans and the countries have developed OWE in their offshore areas. MSP or integrated management or other similar institutions aim at integrated management of marine uses, space, and the relationship between human development activities and the ecosystem. For instance, in the UK, England's marine plans and Scotland's National Marine Plan, which are relevant to OWE, are adopted. Germany has

¹⁴¹⁶ 'Clean and Renewable Energy | Denmark Leads the Way | Denmark.Dk' <<https://denmark.dk/innovation-and-design/clean-energy>> accessed 31 August 2024.

¹⁴¹⁷ 'Offshore Wind Energy in Denmark | CMS Expert Guides' <<https://cms.law/en/int/expert-guides/cms-expert-guide-to-offshore-wind-in-northern-europe/denmark>> accessed 15 January 2023.

¹⁴¹⁸ 'Denmark's Largest Offshore Wind Power Procurement Procedure Launched' (*Invest In Denmark*) <<https://investindk.com/insights/denmarks-largest-offshore-wind-power-procurement-procedure-launched>> accessed 10 February 2025; 'Denmark Aims to Raise Its 2030 Offshore Wind Target by 45% to 12.9 GW | Enerdata' <<https://www.enerdata.net/publications/daily-energy-news/denmark-aims-raise-its-2030-offshore-wind-target-45-129-gw.html>> accessed 15 January 2023.

¹⁴¹⁹ Danish Act on Maritime Spatial Planning (2016) Act 615.

established a maritime spatial plan for the German EEZ of the North Sea and Baltic Sea. Denmark has passed the Maritime Spatial Planning Act in 2016.¹⁴²⁰

5.2.2 Describing the Offshore Wind Energy Regulatory Framework in Jurisdictions under Consideration

5.2.2.1 The UK Regulatory Framework for Offshore Wind Energy

The UK has been reforming its regulatory framework to set targets, shape marine policies and plans, and permit and regulate OWE. The UK's general strategy in clean energy development is to generate income, create jobs, cut GHG emissions, and ensure affordable energy for businesses and customers.¹⁴²¹ The UK has set an ambitious target in 2022 under the British Energy Security Strategy to achieve up to 50 gigawatts of offshore wind by 2030, including 5 GW from innovative floating technology.¹⁴²² As stated in the introductory remarks for each jurisdiction, one of the challenges in the UK's regulatory system was delays in the permitting process for the development of OWE in 2000 and 2003. To address these challenges and to reach other objectives like sustainable development, several changes have been made in the UK's regulatory framework. These changes include streamlining consenting processes, strengthening marine planning for offshore activities, and adopting environmental regulatory measures.

¹⁴²⁰ *ibid* s 1.

¹⁴²¹ The UK Government, 'The Clean Growth Strategy: Leading the Way to a Low Carbon Future' 5 <<https://www.gov.uk/government/publications/clean-growth-strategy>> accessed 4 September 2024.

¹⁴²² 'Offshore Wind' <<https://www.great.gov.uk/international/content/investment/sectors/offshore-wind/>> accessed 16 September 2024.

5.2.2.1.1 Streamlining Consenting Processes

The UK has designed a centralized system for licensing OWE. The Marine and Coastal Access Act of 2009 created the Marine Management Organization (MMO),¹⁴²³ which is responsible for licenses of offshore wind projects of more than 1 megawatt and less than 100 megawatts under section 36 of the Electricity Act 1989.¹⁴²⁴ An offshore wind project as an offshore generation station with a capacity of more than 100 megawatts is considered a Nationally Significant Infrastructure Project, managed through the central licensing authority (Planning Inspectorate) under the Planning Act 2008 as amended.¹⁴²⁵ In terms of each administration, projects over 100 megawatts of generation capacity in England and Wales require consent from the Planning Inspectorate and projects below 100 megawatts require consent from MMO or Natural Resources Wales. In Scotland, any application for an OWE project with a generating capacity over 1 megawatt in the Scottish territorial sea or with a capacity over 50 megawatts in the Scottish Offshore region (beyond 12 up to 200 nautical miles) needs to be submitted to Marine Scotland for obtaining consent under section 36 of the Electricity Act 1989.¹⁴²⁶

Another authority is the Crown Estate, which is the owner of the seabed up to 12 nautical miles and has the right to explore and use the natural resources (excluding fossil fuels) of the British continental shelf under the Continental Shelf Act 1964 and the rights

¹⁴²³ Marine and Coastal Access Act 2009, s 1.

¹⁴²⁴ *ibid* s 12.

¹⁴²⁵ Planning Act 2008, ss 14(1)(a) and 15(3). In addition, according to section 15(4) of the Planning Act 2008, ‘an “offshore” generating station is a generating station that is (a) in waters in or adjacent to England up to the seaward limits of the territorial sea, or (b) in a Renewable Energy Zone, except [the Welsh zone or] any part of a Renewable Energy Zone in relation to which the Scottish Ministers have functions.’ Furthermore, under section 84 of the Energy Act 2004, the Renewable Energy Zone includes the UK’s exclusive economic zone.

¹⁴²⁶ ‘Marine Environment: Licensing and Consenting Requirements - Gov.Scot’ <<https://www.gov.scot/collections/marine-licensing-and-consent/>> accessed 30 August 2024.

to generate electricity from wind on the continental shelf under the Energy Act 2004.¹⁴²⁷ The Crown Estate is entrusted to manage such assets on behalf of the Crown and maintain and enhance their value and the return obtained from them in accordance with the principles of good estate management under the Crown Estate Act 1961.¹⁴²⁸ The Crown Estate grants the right to offshore wind developments under a lease/license agreement. It should be noted that the Crown Estate has the responsibility for the seabed in England, Northern Ireland, and Wales, and with respect to managing the seabed in Scottish territorial waters and adjacent areas of the EEZ of the UK, Crown Scotland was established in 2017.¹⁴²⁹

The lease agreement provides for certain terms and conditions. It grants the developer an option over an area of seabed, but this option is conditional upon the satisfaction of certain conditions. If those conditions are met, the developer can exercise the option and commence construction and if they are not met within a specified time, the option will lapse. The conditions include all statutory consents for the development.¹⁴³⁰ The developer will be able to apply for statutory consent after conducting technical and environmental studies. The developer must consult with relevant stakeholders to assess the project's potential impacts and consult with various organizations and the public. The developer must identify any impacts and demonstrate how such concerns are considered in the development project.¹⁴³¹ After such assessment, the developer must apply for statutory consent.

¹⁴²⁷ Crown Estate Act 1961, s 1; Energy Act 2004, s 84; Continental Shelf Act 1964, s 1(1).

¹⁴²⁸ Crown Estate Act 1961 (n 1427).

¹⁴²⁹ 'Guide to an Offshore Wind Farm' (Published on behalf of The Crown Estate and the Offshore Renewable Energy Catapult 2019) 17 <<https://www.thecrownestate.co.uk/media/2861/guide-to-offshore-wind-farm-2019.pdf>> accessed 29 August 2024.

¹⁴³⁰ *ibid* 18.

¹⁴³¹ *ibid* 19.

To summarize, the UK changed its permitting process and established central governmental bodies (such as the Planning Inspectorate or Marine Scotland in Scotland), creating a “one-stop-shop” system. This system reduces the number of bodies responsible for permitting and facilitates the development of OWE.

5.2.2.1.2 Strengthening Marine Planning for Offshore Activities

Reforming marine planning policies has led to the assignment of tasks to authorities to create plans, helping the management of marine activities. The Marine and Coastal Access Act 2009 introduced the “marine policy statement” (MPS), which is a document in which policy authorities jointly provide general policies to contribute to achieving sustainable development in the UK marine area.¹⁴³² The term “policy authorities” refers to the Secretary of State, the Scottish Ministers, the Welsh Ministers, and the Department of the Environment in Northern Ireland.¹⁴³³ The UK marine area includes the marine planning regions as follows: ‘(a) the English inshore region; (b) the English offshore region; (c) the Scottish inshore region; (d) the Scottish offshore region; (e) the Welsh inshore region; (f) the Welsh offshore region; (g) the Northern Ireland inshore region; (h) the Northern Ireland offshore region’.¹⁴³⁴ Each administration has to prepare and adopt its regional marine plans based on the UK’s MPS. For example, the Marine (Scotland) Act 2010 requires that Scottish Ministers prepare and adopt a national marine plan for the Scottish marine area.¹⁴³⁵ The Scottish National Marine Plan aims for sustainable development in the planning area and includes policies on the contribution of nature conservation, marine protected areas,

¹⁴³² Marine and Coastal Access Act 2009, s 44(1).

¹⁴³³ *ibid* s 44(4).

¹⁴³⁴ *ibid* s 49(1).

¹⁴³⁵ Marine (Scotland) Act 2010, s 5(1).

and relevant conservation sites.¹⁴³⁶ In the Scottish National Marine Plan, the Scottish Ministers must set “economic, social and marine ecosystem objectives” and “objectives relating to the mitigation of, and adaptation to, climate change”.¹⁴³⁷ The plan must also include an assessment of the condition of the Scottish marine area or region and “a summary of significant pressures and the impact of human activity on the area or region”.¹⁴³⁸

5.2.2.1.3 The UK Marine Policy Statement

The UK’s MPS is a framework used to integrate different objectives and marine uses and manage competing demands and compatible activities.¹⁴³⁹ The MPS, as mandated under the Marine and Coastal Access Act 2009, was jointly adopted by the UK Government, the Northern Ireland Executive, the Scottish Government, and the Welsh Assembly Government in 2011.¹⁴⁴⁰ Under the MPS, the UK administration authorities prepare marine plans, which provide the process for MPS implementation in a specific relevant area and should be consistent with the policy goals, principles, and considerations of the MPS.¹⁴⁴¹ The UK’s vision of a marine area, as introduced in MPS, is an area that is “clean, healthy, safe, productive and biologically diverse”.¹⁴⁴² MPS identifies marine

¹⁴³⁶ *ibid* s 5(3).

¹⁴³⁷ *ibid* s 5(4)(a).

¹⁴³⁸ *ibid* s 5(4)(b) & (c).

¹⁴³⁹ ‘UK Marine Policy Statement’ (2011) 3–4 <<https://www.gov.uk/government/publications/uk-marine-policy-statement>> accessed 31 August 2024.

¹⁴⁴⁰ UK Marine Policy Statement (n 1439).

¹⁴⁴¹ *ibid* 7.

¹⁴⁴² *ibid* 10.

planning as a tool that fulfills this vision by managing resources and competing activities to achieve sustainable development.¹⁴⁴³

The MPS also identifies high-level marine objectives which include: (i) “[A]chieving a sustainable marine economy” (e.g. through building infrastructure to enhance profitable and efficient industries); (ii) “[E]nsuring a strong, healthy, and just society” (e.g. through the equitable access of society to marine areas); (iii) “[L]iving within environmental limits” (e.g. through the protection and recovery of biodiversity); and (iv) “[U]sing sound science responsibly” (e.g. through sound evidence and monitoring).¹⁴⁴⁴ The defined high-level objectives give general guidance as to what direction the policymakers should take in the regional and specific marine statements they will adopt. It also enhances harmonization and integration among various MSPs.

5.2.2.1.4 The UK Marine Plans and the Role of OWE England’s East Inshore and East Offshore Marine Plan

One of the objectives of England’s East Inshore and East Offshore Marine Plan is to contribute to the development of OWE through planning, policies, and setting priorities. Offshore wind farms, which are anticipated to be completed by 2034 under this plan, will be the most transformational activity and will contribute to the economic growth of the areas.¹⁴⁴⁵ The Plan also provides two policies for OWE. Policy WIND1 protects the existing rights of offshore wind farms from other new developments and other activities until a) The offshore wind farm is constructed; b) The lease/agreement for lease is handed

¹⁴⁴³ *ibid.*

¹⁴⁴⁴ *ibid* 11–12.

¹⁴⁴⁵ East Inshore and East Offshore Marine Plans (Department for Environment, Food and Rural Affairs) 26 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312496/east-plan.pdf> accessed 31 August 2024.

over back to the Crown Estate; c) The lease has been terminated by the Secretary of State; or d) Exceptional circumstances arise.¹⁴⁴⁶ Policy Wind2 provides that “proposals for Offshore Wind Farms inside Round 3 zones, including relevant supporting projects and infrastructure, should be supported”.¹⁴⁴⁷ This means that public authorities are allowed to consider the development of offshore wind farms favorably.¹⁴⁴⁸ However, other policies may sometimes take precedence. For example, OG2, the oil and gas policy that supports proposals for new oil and gas activities over proposals for other developments, takes precedence over WIND2.¹⁴⁴⁹ The reason behind the OG2 is the policy objective set by MPS, which states that marine plan authorities should take into consideration “the UK’s policy objective to maximize economic development of the UK’s oil and gas resources reflecting their importance to the UK’s economic prosperity and security of energy supply”.¹⁴⁵⁰

Scotland’s National Marine Plan and Sectoral Plan for Offshore Wind Energy

Scotland’s National Marine Plan sets a mix of objectives and policies while providing resolution for conflicts. It has adopted an ecosystem approach to mainly protect the environment and the health and resilience of the ecosystem while supporting the

¹⁴⁴⁶ *ibid* 119. This Plan adds that ‘Examples of where a site may be surrendered back and not re-tendered include the development of oil and gas in part or all of an area covered by this policy (where negotiated in line with policy OG2) whereby some or all of the area may be surrendered ... The exceptional circumstances include where an Offshore Wind Farm lease holder or agreement for lease holder grants permission for another party to use that area for another (non- Offshore Wind Farm) use.’

¹⁴⁴⁷ *ibid* 121.

¹⁴⁴⁸ *ibid* 122.

¹⁴⁴⁹ *ibid* 115 & 122.

¹⁴⁵⁰ *ibid* 115; ‘UK Marine Policy Statement’ (n 1439) 30.

sustainable use of the marine ecosystem.¹⁴⁵¹ This Plan encourages co-existence among the sectors and activities and discourages uses causing an area to be unsuitable for future uses.¹⁴⁵² However, given that competing demands are increasing and conflict is unavoidable, the Plan provides some guidance on how to resolve conflicts between competing demands.¹⁴⁵³ The Plan sets out the following factors that should be considered in decision-making: emphasizing the overarching presumption planning principle of sustainable development and use, giving statutory weight to renewable energy development in marine planning, and using consultation and adaptive management.¹⁴⁵⁴ In the event that some activities are not compatible with other activities, “preferential use by specific sectors” may be identified in the regional marine plans.¹⁴⁵⁵ To select an area with preferential use, scoping the area, considering sectoral and environmental limitations, prioritizing development and uses, appraising the environmental and social impacts of uses, and conducting consultations should all be done.¹⁴⁵⁶

This Plan sets specific objectives for OWE and marine renewable energy and considers how to resolve conflicts in this specific sector. The objectives include sustainable development of this type of energy, maximized supply chain of the sector in Scotland, integrated marine and coastal planning and licensing, achieving energy and climate change targets (e.g. the generation of electricity equivalent to 100 percent of Scotland’s gross

¹⁴⁵¹ Scotland’s National Marine Plan (The Scottish Government 2014) 10
<<https://www.gov.scot/publications/scotlands-national-marine-plan-9781784128555/>> accessed 31 August 2024.

¹⁴⁵² *ibid* 22.

¹⁴⁵³ *ibid* 12 & 20.

¹⁴⁵⁴ *ibid*.

¹⁴⁵⁵ *ibid* 22.

¹⁴⁵⁶ *ibid*.

annual electricity consumption) and coordinated monitoring between industry and government.¹⁴⁵⁷ The Plan acknowledges that the development of renewable energy requires space and can have impacts on other existing or planned sectors such as fisheries, aquaculture, and shipping, to name a few. It suggests that an inclusive approach that can avoid or minimize such impacts can be adopted.¹⁴⁵⁸ An inclusive approach would identify the impacts on other sectors and would address them through creating communications among developers and by mitigating the impacts of the development of renewable energy on other sectors at the planning, assessment, and application stages.¹⁴⁵⁹ For example, good communication and working groups have been created between OWE and the fishing sector, such as the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW).¹⁴⁶⁰ In addition, the cumulative environmental impacts of OWE should be assessed on a case-by-case basis because the impacts depend on various factors such as location and technology.¹⁴⁶¹ This Plan also sets out some policies for the renewable energy sector. For example, it provides for the preferred locations for the development of marine renewables where preference should either be given to them by decision-makers over other development proposals or development proposals must be consulted with the public or stakeholders to assess the impacts.¹⁴⁶²

Scotland has experienced conflicts between marine renewable energy and other sectors. The “Pentland Firth and Orkney Waters” is an example of what happened when

¹⁴⁵⁷ *ibid* 82.

¹⁴⁵⁸ *ibid* 88.

¹⁴⁵⁹ *ibid*.

¹⁴⁶⁰ *ibid*.

¹⁴⁶¹ *ibid* 88–89.

¹⁴⁶² *ibid* 90.

marine planning was applied to this area.¹⁴⁶³ The government of Scotland designated this area as a non-statutory pilot regional marine spatial plan because it included rich renewable sources and plans for marine renewables development while there were habitats and human activities in place in this area.¹⁴⁶⁴ The reported central conflict in the planning of this area was related to rights and ownership. There were statutory uncertainties about how to resolve the conflict between the seabed rights of the Crown Estate, the ancient public right to fish and the right of navigation, and the UK marine protected areas program.¹⁴⁶⁵ There were stakeholder interests in onshore and offshore installations, operations, and infrastructures. Fishing has also been a traditional human activity that cannot be shut down or substituted because it generated substantial benefits (8 million pounds per year) for the local community.¹⁴⁶⁶ Some initiatives could reduce these conflicts. For instance, the Marine Planning Partnership, which involved Marine Scotland, local authorities, and stakeholders was employed for more integration.¹⁴⁶⁷ Such integration, however, needed a clear mechanism to resolve competing interests.¹⁴⁶⁸ Another undertaken initiative was consultation through events and workshops, although time and interest were among the obstacles to achieving effective participation.¹⁴⁶⁹

¹⁴⁶³ Kate R Johnson, Sandy A Kerr and Jonathan C Side, 'The Pentland Firth and Orkney Waters and Scotland – Planning Europe's Atlantic Gateway' (2016) 71 *Marine Policy* 285.

¹⁴⁶⁴ *ibid.*

¹⁴⁶⁵ *ibid* 287–288.

¹⁴⁶⁶ *ibid* 288.

¹⁴⁶⁷ *ibid* 289.

¹⁴⁶⁸ *ibid.*

¹⁴⁶⁹ *ibid* 290.

Scotland has also formulated a Sectoral Marine Plan for OWE, seeking to achieve Scottish and UK energy policy targets through a spatial strategy.¹⁴⁷⁰ The Plan establishes a spatial strategy to help reduce the conflicts between OWE and other marine uses and the environment such as commercial fishing, shipping, and natural heritage.¹⁴⁷¹ To materialize the strategy, the Plan identifies 15 sustainable plan options, which are the outcomes of consultation processes and sustainability appraisals.¹⁴⁷² Part of the iterative process is the consultation, which engages stakeholders and uses GIS and spatial data resources, to analyze opportunities and constraints and identify suitable areas so that the impacts on the environment, other sectors, and users of the sea are minimized.¹⁴⁷³ The other part of the process is sustainability appraisal, which consists of SEA, Habitats Regulations Appraisal, and Social and Economic Impact Assessment. This appraisal is undertaken to create reports with findings that help regional locational guidance for OWE.¹⁴⁷⁴

The implementation of the Plan must integrate various measures. Firstly, the community and stakeholders must be engaged to discuss relevant issues resulting from the conflict between OWE and other marine uses and the environment, the cumulative assessment, socio-economic impacts, and commercial fishing.¹⁴⁷⁵ Secondly, project-level assessment should be conducted to guide consenting bodies about the impacts of projects

¹⁴⁷⁰ Scottish Government, ‘Sectoral Marine Plan for Offshore Wind Energy’ (2020) 12
<<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/10/sectoral-marine-plan-offshore-wind-energy/documents/sectoral-marine-plan-offshore-wind-energy/sectoral-marine-plan-offshore-wind-energy/govscot%3Adocument/sectoral-marine-plan-offshore-wind-energy.pdf>>
accessed 5 September 2024.

¹⁴⁷¹ *ibid.*

¹⁴⁷² *ibid.*

¹⁴⁷³ *ibid.* 21.

¹⁴⁷⁴ *ibid.* 28.

¹⁴⁷⁵ *ibid.* 59.

individually and provide certainty on the type, location, and scale of technology.¹⁴⁷⁶ Thirdly, as part of the licensing conditions, the developers must gather and submit monitoring data to the licensing authority, which can inform iterative planning and further assessments.¹⁴⁷⁷

The overarching regulatory objectives and policies for all involved sectors are the most important characteristic of the UK's marine planning. The policies acknowledge that climate change should be addressed by clean energy. OWE is the main source of renewable energy production. The development of OWE in the context of MSP needs support and the UK marine policies have recognized this necessity and have specified priority areas for the development of OWE. The policies also contain some principles on public engagement in planning or conducting cumulative environmental assessments. Therefore, for the inclusion of OWE in MSP, all technological, environmental, economic, and social facts should be considered.

5.2.2.1.5 Adopting Environmental Regulatory Measures

Introduction of New Regulatory Measures in 2023

The Energy Act 2023 introduces a set of new measures for regulating the impacts of OWE. Chapter 1 of Part 13 of this Act introduces three crucial schemes for OWE. Firstly, it introduces strategic compensation for adverse environmental effects.¹⁴⁷⁸ There are obligations under the UK primary legislation that the relevant public authority must ensure

¹⁴⁷⁶ *ibid.*

¹⁴⁷⁷ *ibid* 60.

¹⁴⁷⁸ Energy Act 2023, s 291.

that appropriate measures are taken for adverse environmental effects of an activity related to OWE.¹⁴⁷⁹ The term “adverse environmental effects” is defined as

- (a) anything that adversely affects the integrity of any site comprised in the national site network, or
- (b) anything that hinders the achievement of the conservation objectives stated for a protected marine area.¹⁴⁸⁰

The term “the national site network” also refers to the network of sites in the UK’s territory, which consists of the sites that formed part of Natura 2000 immediately before Brexit or the sites for retained transposing regulations after Brexit. Natura 2000 includes the network of Special Areas of Conservation and Special Protection Areas under the Birds Directive and Habitats Directive.¹⁴⁸¹

Secondly, Chapter 1 of Part 13 of the Energy Act 2023 introduces the marine recovery fund. While the establishment, operation, and management of this fund are left to the regulations that may be made by the Secretary of State, the purpose of this fund is to make payments for expenditures on measures to compensate for adverse environmental effects of relevant OWE activities.¹⁴⁸²

Thirdly, compensatory measures must be taken or secured by a public authority about the adverse environmental effects of OWE on protected sites.¹⁴⁸³ However, the

¹⁴⁷⁹ *ibid* s 291 (1), (2) & (3).

¹⁴⁸⁰ *ibid* s 291(4).

¹⁴⁸¹ ss 3(1). It should be noted that the retained laws are those EU laws or regulations that have been retained to avoid uncertainty or gaps after Brexit. The EU (Withdrawal) Act 2018 was passed after the post-Brexit transition period in 2020 to provide legal certainty. This Act is significantly changed subsequently by the Retained EU Law (Revocation and Reform) Act 2023, which sets new revocation and sunset procedures for all retained EU law.

¹⁴⁸² Energy Act 2023 (n 1478) s 292(1) & (2).

¹⁴⁸³ *ibid* s 292(1)(b).

related details such as the matters to be assessed and the assessment procedures are left to the relevant authorities.¹⁴⁸⁴ For example, the appropriate authority can make provisions regarding the nature and scope of the assessment, the assessor, and other regulatory requirements. Details of this fund help reduce the adverse effects of OWE.

Protection of Marine Conservation Zones

The appropriate authority may designate Marine Conservation Zones to conserve marine flora or fauna (e.g. to conserve their diversity or the rare/threatened species), marine habitats, and features of geological or geomorphological interest.¹⁴⁸⁵ When the appropriate authority determines an application for development activity (e.g. OWE), which may affect the protected features of Marine Conservation Zones or their underlying ecological or geomorphological processes, some conditions must be met.¹⁴⁸⁶ The person seeking authorization must satisfy the authority that there is no significant risk of hindering the achievement of the objectives set for the Marine Conservation Zones.¹⁴⁸⁷ Suppose the person seeking authorization cannot demonstrate that there is no significant risk of hindering the achievement of the objectives set for Marine Conservation Zones. In that case, that person must satisfy the authority that there is not any other manner or location to lower the risk of damage by the activity to the environment, the benefit to the public outweighs the damage to the environment, and measures of environmental benefits to the damage will be taken.¹⁴⁸⁸

Impact Assessments for European Offshore Marine Sites

¹⁴⁸⁴ *ibid* s 293(4).

¹⁴⁸⁵ Marine and Coastal Access Act 2009 (n 1423) ss 116 and 117.

¹⁴⁸⁶ *ibid* s 126(1).

¹⁴⁸⁷ *ibid* s 126(6).

¹⁴⁸⁸ *ibid* s 126(7).

Undertaking an EIA is usually required for OWE projects. For example, when a project such as projects related to OWE may have a significant impact on a European offshore marine site, which includes Special Areas of Conservation and Special Protection Areas, a competent authority must undertake an appropriate assessment of the implications of that project on the sites in light of the site's conservation objectives (known as Habitats Regulations Appraisal).¹⁴⁸⁹

After determining that the project will not adversely affect the integrity of the European offshore marine site, the authority may approve it.¹⁴⁹⁰ Notwithstanding the negative implications of the project on a European offshore marine site, the authority may approve a project if there are no alternative solutions, and the project must be carried out for 'imperative reasons of overriding public interests..., which may be of a social or economic nature'.¹⁴⁹¹ In case a priority species or priority natural habitat is present in the site, the nature of the reasons must either be related to the 'human health, public safety or beneficial consequences of primary importance to the environment' or considered to be "imperative reasons of overriding public interest".¹⁴⁹² The authority must have due regard to "the national interest" when giving an opinion about whether the reasons are imperative reasons for overriding public interest.¹⁴⁹³ In addition, for the cases where a project has negative implications on a European marine site and consent, permission, or authorization

¹⁴⁸⁹ The Conservation of Habitats and Species Regulations 2017, s 63(1).

¹⁴⁹⁰ *ibid* s 63(5).

¹⁴⁹¹ *ibid* s 64(1).

¹⁴⁹² *ibid* s 64(2).

¹⁴⁹³ *ibid* s 64(4).

is given, the authority must make sure that ‘any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected’.¹⁴⁹⁴

Another case is when an OWE project may have adverse impacts on marine wildlife by disturbing or harming species protected under the Habitats Directive. A license must be obtained when there is an adverse impact on protected species such as whales, dolphins, porpoises, and turtles under the Conservation of Offshore Marine Habitats and Species Regulations 2017. A deliberate capture, injury, or killing of any wild bird and taking, damaging, or destroying the nest of any wild bird are, among others, prohibited unless a license is obtained under regulations.¹⁴⁹⁵ For granting a license, there must not be any other satisfactory solutions, and such a grant must be consistent with the restrictions of the Birds Directive, including being “under strictly supervised condition and on a selective basis” and in respect of a small number of birds.¹⁴⁹⁶ Furthermore, a license may be given for ‘imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment’.¹⁴⁹⁷ If a license is granted for the imperative reasons of overriding public interest, the authority must be satisfied that there is no satisfactory alternative and the activity ‘will not be detrimental to the maintenance of the populations of the species concerned at a favorable conservation status in their natural range’.¹⁴⁹⁸

Natural England, which is a statutory advisor for nature conservation, has also reviewed and explained its approach to minimizing the impacts of OWE and thriving

¹⁴⁹⁴ *ibid* s 68.

¹⁴⁹⁵ The Conservation of Offshore Marine Habitats and Species Regulations 2017, ss 40(1) and 55.

¹⁴⁹⁶ *ibid* s 55(4).

¹⁴⁹⁷ *ibid* s 55(6)(a).

¹⁴⁹⁸ *ibid* s 55(7).

marine and coastal nature. It has provided some recommendations: (i) Avoiding irreparable harm by selecting appropriate OWE sites through a “risk and opportunity spatial map” or “heat map” in the planning system, “strategic and standardized baseline data collection”, and accurate and evidenced information; (ii) Mitigating impacts through feedback cycles, strategic monitoring, and forward-looking and innovative designs for future; (iii) Compensating residual or negative effects in advance of impacts strategically and effectively; and (iv) Designing developments that enhance biodiversity, reduce pressures on biodiversity and restore habitats and species by applying nature enhancement mechanisms such as Net Gain.¹⁴⁹⁹

5.2.2.1.6 Just Transition for the Fishing Industry

Just transition for the fishing industry underscores the importance of a fair and compensatory framework for the fishing industry. First, procedural fairness should be considered to ensure that people in the fishing industry affected by the development of OWE are heard and provided with the opportunity to participate in the decision-making process, particularly through MSP.¹⁵⁰⁰ “Fisheries-led initiatives” and “fisheries liaisons” are critical in achieving effective management.¹⁵⁰¹ For example, FLOWW was established in the UK in 2002 to facilitate discussions and communication between the fishing industry and developers and the co-existence of these industries.¹⁵⁰² FLOWW offers guidance on

¹⁴⁹⁹ Alex Natural England, ‘Natural England’s Approach to Offshore Wind’ (2021) Natural England Technical Information Note, TIN181.

¹⁵⁰⁰ Claire Haggett and others, ‘Offshore Wind Projects and Fisheries: Conflict and Engagement in the United Kingdom and the United States’ (2020) 33 *Oceanography* 42–43.

¹⁵⁰¹ *ibid* 43.

¹⁵⁰² ‘FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison’ (2014) 1 <<https://www.thecrownestate.co.uk/media/1775/ei-km-in-pc-fishing-012014-floww-best-practice-guidance-for-offshore-renewables-developments-recommendations-for-fisheries-liaison.pdf>> accessed 20 November 2024.

how the liaison is established and operates between developers and the fishing industry during the planning, construction, and operation phases of offshore renewable energy projects.¹⁵⁰³ This liaison helps with an appropriate site selection and assessment of the likely impacts on the fishing industry. It also creates a forum where developers and their contractors are obliged to disseminate information and include fishing liaisons in their contractual documents such as execution, safety, and navigation plans.¹⁵⁰⁴

Second, co-existence, mitigation measures, and compensation are other options that provide a collaborative approach to the development of OWE. The project planning should provide a systematic and timely opportunity to engage the fishing industry to explore the co-existence option. There is no one-size-fits-all approach to achieve the co-existence between offshore renewable energy and the fishing industry as the identification and exploration of this option is context-dependent.¹⁵⁰⁵ If co-existence is not possible or, if undertaken, significant residual impacts remain, mitigation measures should be adopted. These measures may include improving stocks and fishing vessels, enhancing profits, and developing new fishing grounds or activities.¹⁵⁰⁶ Finally, a compensation regime is a form of distributional justice for the fishing industry in case of loss or damage due to the displacement or disruption of fisheries.¹⁵⁰⁷ Compensation is considered only if co-

¹⁵⁰³ *ibid* 16.

¹⁵⁰⁴ *ibid* 28.

¹⁵⁰⁵ *ibid* 30.

¹⁵⁰⁶ *ibid*.

¹⁵⁰⁷ Haggett and others (n 1500) 42.

existence and mitigation are not possible or adequate.¹⁵⁰⁸ The compensation claim must be substantiated by factual evidence and accurate information.¹⁵⁰⁹

The UK experience highlights the importance of balancing OWE development with ecosystem health, biodiversity protection, and the mitigation of conflicts with other marine activities, such as fishing and shipping. A centralized and tiered system simplifying permitting due to the climate urgency while addressing environmental impacts through early stakeholder engagement and adaptive management is a key lesson. The second key lesson is the focus on MSP to provide a robust tool for ensuring sustainable development, incorporating ecosystem-based approaches, designating priority areas for OWE, and reconciling competing demands through consultation and spatial strategies. A third critical lesson is the importance of fostering dialogue and co-existence between OWE developers and industries like fishing—through initiatives such as the Fishing Liaison with FLOWW— to ensure procedural fairness and equitable solutions. Involving local communities early and addressing socio-economic impacts to promote a just transition for affected sectors is also of central importance. Finally, the UK's emphasis on innovative environmental designs, such as establishing a marine recovery fund, achieving biodiversity net gain, and strategic monitoring offers a model for aligning renewable energy development with ecological objectives.

5.2.2.2 Germany's Regulatory Framework for Offshore Wind Energy

Germany has a federal system, which affects how the regulatory system governs OWE projects. Based on the Basic Law for the Federal Republic of Germany 1949, the law

¹⁵⁰⁸ 'FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison' (n 1502) 31–32.

¹⁵⁰⁹ *ibid.*

relating to economic matters including energy as well as the protection of nature and landscape management are within the concurrent legislative power.¹⁵¹⁰ In addition, the general rule is that ‘on matters within the concurrent legislative power, the *Länder* (state) shall have the power to legislate so long as and to the extent that the Federation has not exercised its legislative power by enacting a law’.¹⁵¹¹

Laws applicable to OWE provide clarification on how powers are employed. While federal laws apply to OWE projects that are located in the territorial sea, state authorities administer these projects.¹⁵¹² The projects that are located in the EEZ are administered by the Federal Maritime and Hydrographic Agency (BSH) under the Federal Marine Installations Ordinance, or for OWE projects starting after December 31, 2020, under the Offshore Wind Energy Act.¹⁵¹³ BSH is the authority within the Federal Ministry of Transport and Digital Infrastructure, which develops marine plans for the EEZ of the North Sea and the Baltic Sea. The Marine Facilities Ordinance regulates the EEZ concessions and the BSH is responsible for conducting EIA and ensuring that the public participates in the process of decision-making on the development of OWE. For the territorial sea, the approval procedure is determined under the planning of each state and the Federal Pollution Control Act.

¹⁵¹⁰ Christian Tomuschat and others (trs), ‘Basic Law for the Federal Republic of Germany’ The revised version published in the Federal Law Gazette Part III, classification number 100-1, as last amended by the Act of 19 December 2022 (Federal Law Gazette I p. 2478) arts 74(1)(11) and 74(1)(29) <https://www.gesetze-im-internet.de/englisch_gg/englisch_gg.html> accessed 9 September 2024.

¹⁵¹¹ *ibid* art 72(1).

¹⁵¹² White & Case, ‘Offshore Wind Projects: Assessing the Environmental Impact’ (2019) 6 <<https://www.whitecase.com/sites/whitecase/files/offshore-wind-projects-assessing-the-environmental-impact-final.pdf>> accessed 30 August 2024.

¹⁵¹³ *ibid*.

5.2.2.2.1 Environmental Regulatory Requirements

The impacts of OWE are assessed through regulatory tools, including SEA, EIA, and nature conservation assessments. SEAs are used to assess regional and sectoral plans and planning alternatives and focus on the species (fish, birds, and marine mammals), their habitats, and the interaction of protected areas with other areas.¹⁵¹⁴ They inform marine spatial plans and site development plans to be updated or amended according to new data and findings.¹⁵¹⁵ In particular, BSH uses the outcome of SEA for suitability examination of OWE sites.¹⁵¹⁶ Environmental impacts assessment is also required for planning OWE projects to examine the impacts of the project on species and their habitats.¹⁵¹⁷ Wind farms and their grid infrastructure are listed in Annex II of the Environmental Impact Assessment Directive and in accordance with the German Federal Emission Control Act and the Federal Act on Environmental Impact Assessment, 2000, when a wind farm project consists of 20 or more wind turbines and an overall height of 50 meters, it must undergo an EIA; and for a wind farm project with less than 20 turbines, the need for EIA will be decided on a case by case basis.¹⁵¹⁸

BSH also sets and follows certain regulatory measures in the approval process of OWE to protect the environment. For example, it sets standards and procedures on the

¹⁵¹⁴ 'BSH - Environmental Assessments' <https://www.bsh.de/EN/TOPICS/Offshore/Environmental_assessments/environmenta_assessments_node.html> accessed 6 September 2024.

¹⁵¹⁵ *ibid.*

¹⁵¹⁶ *ibid.*

¹⁵¹⁷ *ibid.*

¹⁵¹⁸ Christia Pielow, Hans Martin Koopmann and Philip Engels, 'Energy Law in Germany' in Martha Roggenkamp and others (eds), *Energy Law in Europe: National, EU and International Regulation* (Second Edition, 2007) 702; European Investment Bank, 'Environmental and Social Data Sheet' (2022); 'Federal Act on Environmental Impact Assessment' <<https://www.fao.org/faolex/results/details/en/c/LEX-FAOC089276/>> accessed 6 September 2024.

minimum requirements for marine environmental surveys and monitoring during construction and operation periods.¹⁵¹⁹ Under the standards, there are restrictions on the lights of offshore wind farms and requirements for monitoring and reporting the impacts of OWE on birds for three to five years.¹⁵²⁰ Developers must also take preventive and mitigation measures such as selecting appropriate sites to avoid barrier effects on birds and loss of their habitats, employing technologies that introduce the least noise to minimize the impacts on fish and marine mammals, and selecting appropriate time for construction to avoid impacts on marine life processes.¹⁵²¹ Another regulatory tool is nature conservation assessment, which is used to assess the impacts of projects on protected areas, species, and biotopes to avoid or minimize negative effects or take compensatory measures.¹⁵²²

BSH develops plans to coordinate marine activities (such as OWE and shipping) and protect the environment. The plans designate some priority areas for OWE. In the priority areas, other marine uses which are not compatible with OWE are prohibited. Such designation does not mean that other marine areas cannot be permitted to develop OWE. However, areas of the Natura 2000 Network, which is a nature protection area designated under the Habitats Directive and the Birds Directive, are excluded from offshore installations.

¹⁵¹⁹ ‘Standard Investigation of the Impacts of Offshore Wind Turbines on the Marine Environment (StUK4)’ (Bundesamt für Seeschifffahrt und Hydrographie (BSH) Federal Maritime and Hydrographic Agency 2013) <https://www.bsh.de/DE/PUBLIKATIONEN/_Anlagen/Downloads/Offshore/Standards/Standard-Investigation-impacts-offshore-wind-turbines-marine-environment_en.pdf?__blob=publicationFile&v=6> accessed 10 September 2024.

¹⁵²⁰ White & Case LLP - JDSupra, ‘Offshore Wind Projects: Assessing the Environmental Impact: Germany’ <<https://www.jdsupra.com/legalnews/offshore-wind-projects-assessing-the-48704/>> accessed 13 January 2023.

¹⁵²¹ *ibid.*

¹⁵²² ‘BSH - Environmental Assessments’ (n 1514).

After 2017, there have been some changes in its regulatory framework. Germany has a statutory target of increasing the installed capacity of offshore wind turbines to a total of at least 30 gigawatts by 2030, 40 gigawatts by 2035, and 70 gigawatts by 2045 under the Offshore Wind Energy Act.¹⁵²³ The governmental authorities are responsible for preselecting the locations suitable for OWE. Developers must compete at public auctions to receive an award to develop OWE. In particular, the Federal Network Agency is the responsible body for the preliminary investigation of sites. It conducts this responsibility in agreement with BSH if the sites are located in the EEZ or with the authority responsible under Land Law if the sites are located in the territorial sea.

Approval of OWE projects is not without limitations. The compatibility of projects with the conservation objectives of the Natura 2000 site must be assessed if they, individually or in combination with other activities, may significantly affect the site and do not directly serve the purpose of the site's management.¹⁵²⁴ To determine the compatibility, the purpose of the protection and the provisions issued to serve that purpose shall be considered.¹⁵²⁵ After the assessment, if it is found that the effects of the project on the site are significant, that project will not be approved unless the project is essential for “imperative reasons of overriding public interest, including those of social or economic nature” and “there are no reasonable alternative ways of achieving the project's purpose at

¹⁵²³ Offshore Wind Energy Act 2016 (Federal Law Gazette I p. 2258, 2310), last amended by Article 10 of the Act of 8 May 2024 (Federal Law Gazette 2024 I No. 151) s 1(2) <<https://www.gesetze-im-internet.de/windseeg/BJNR231000016.html#BJNR231000016BJNG000100000>> accessed 9 September 2024.

¹⁵²⁴ Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act – BNatSchG) 2009: Unofficial Translation' (Federal Law Gazette [Bundesgesetzblatt] I p. 2542, s 34(1) <https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Naturschutz/bnatschg_en_bf.pdf> accessed 9 September 2024.

¹⁵²⁵ *ibid* s 34(1).

another location with no or fewer adverse effects'.¹⁵²⁶ In addition, if priority natural habitats or species in the site are affected, the acceptable reasons for overriding public interest are a few cases such as human health, public safety (e.g, national defense), or beneficial effects of the project on the importance of the environment.¹⁵²⁷ Other reasons (e.g. of economic nature) require authorization from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).¹⁵²⁸

Even if the project is approved, general provisions related to intervention in nature and landscape will be applied to OWE projects under the Act on Nature Conservation and Landscape Management. If there are any significant adverse effects of the project on nature and the landscape that are unavoidable, they must be offset through compensation measures, substitution measures, or where offset is not possible, through monetary substitution.¹⁵²⁹ When reasonable alternatives can be employed with lesser or no adverse effects on nature and landscape, the effects are considered avoidable.¹⁵³⁰ Compensation measures are the measures taken to restore the impaired functions of natural balance equivalently, and they are considered substituted if they restore the impaired functions of natural balance to an equivalent value.¹⁵³¹

5.2.2.2.2 Spatial Planning in the North Sea and the Baltic Sea

In the German EEZ of the North Sea and the Baltic Sea, spatial planning objectives and principles must be established as a spatial plan in accordance with the Annex to the

¹⁵²⁶ *ibid* s 34(3).

¹⁵²⁷ *ibid* s 34(4).

¹⁵²⁸ *ibid* s 34(5).

¹⁵²⁹ *ibid* art 13.

¹⁵³⁰ *ibid* art 15(1).

¹⁵³¹ *ibid* art 15(2).

Ordinance on Spatial Planning in the German Exclusive Economic Zone in the North Sea and the Baltic Sea.¹⁵³² This ordinance entered into force on 1 September 2021.¹⁵³³ The plan annexed to the ordinance identifies some areas as priority areas for OWE to ensure the expansion of OWE to achieve targets for the energy sector by 2030 and decarbonization of the electricity sector by 2045.¹⁵³⁴ A priority area may be designated for development at a specific time in the future (e.g. from 2030) with conditions. For example, the area may be required for shipping. If there are reasonable grounds for the safety and efficiency of shipping, priority will be given to shipping.¹⁵³⁵ Some areas might also be designated as reservation areas for further expansion of 40 gigawatts by 2040.¹⁵³⁶ A reservation area for OWE for development from a specific time in the future might also be set aside if it proves that such an area must be free from development and is essential for fishery research.¹⁵³⁷

The plan, however, authorizes the multi-use of OWE and fishing under certain circumstances. Fishing vessels can pass through the offshore wind farms to reach their fishing grounds. Some types of passive fishery (e.g., fish traps and baskets) are possible in the safety zones of offshore wind farms but not in the enclosed areas of installations or near

¹⁵³² Ordinance on Spatial Planning in the German Exclusive Economic Zone in the North Sea and the Baltic Sea, Federal Law Gazette Volume 2021 Part I Number 58, issued at Bonn on 26 August 2021, s 1 <https://www.bsh.de/EN/TOPICS/Offshore/Maritime_spatial_planning/Maritime_Spatial_Plan_2021/_Anlagen/Downloads/ROP_2021/Ordinance.pdf;jsessionid=F0F139612AD2EA958F0835801E77688D.live11293?__blob=publicationFile&v=5> accessed 10 September 2024.

¹⁵³³ *ibid* s 2.

¹⁵³⁴ ‘Annex to the Spatial Planning Ordinance for the German Exclusive Economic Zone in the North Sea and in the Baltic Sea Dated 19 August 2021 - Unofficial Translation -’ Annex Volume to the Federal Law Gazette Part I No. 58 dated 26 August 2021 12 and para 2.2.2(1) <https://www.bsh.de/EN/TOPICS/Offshore/Maritime_spatial_planning/Maritime_Spatial_Plan_2021/_Anlagen/Downloads/ROP_2021/Maritime_Spatial_Plan_2021.pdf;jsessionid=F0F139612AD2EA958F0835801E77688D.live11293?__blob=publicationFile&v=5> accessed 10 September 2024.

¹⁵³⁵ *ibid* para 2.2.2(1).

¹⁵³⁶ *ibid* paras 12 and 2.2.2(2).

¹⁵³⁷ *ibid* para 2.2.2(2).

installations.¹⁵³⁸ The plan also requires that the introduction of sound into the marine environment during the construction period of OWE installations be avoided as much as possible using state-of-the-art science and technology.¹⁵³⁹ Cables must also be laid with overall coordination and “the most non-disruptive laying procedure”.¹⁵⁴⁰

The effectiveness of the regulatory framework and marine planning has been criticized by NABU, which is the largest and oldest nature conservation association in Germany. According to NABU, the current MSP reflects existing marine uses and includes offshore wind farms in the remaining areas while some designated areas for offshore wind farms should be kept free.¹⁵⁴¹ Sufficient buffer zones should be established for marine protected areas and such critical areas must be avoided in the planning of OWE.¹⁵⁴² Even in the green areas, which are more compatible with nature and identified in its study, NABU notes that such areas are not a “free pass” and appropriate compensatory measures must be adopted.¹⁵⁴³ NABU recommends that the locations of OWE projects should be selected based on nature conservation criteria, environmental assessments must be conducted carefully, and effective preventive and mitigation measures must be taken.¹⁵⁴⁴

Germany's regulatory framework demonstrates the importance of combining robust environmental assessments, spatial planning, and compensatory mechanisms to enable the development of OWE while safeguarding ecological considerations. It also offers

¹⁵³⁸ *ibid* para 2.2.2(4).

¹⁵³⁹ *ibid* para 2.2.2(6).

¹⁵⁴⁰ *ibid* para 2.2.3(6).

¹⁵⁴¹ ‘NABU Study: How Can Nature-Friendly Offshore Development Be Achieved?’ <<https://www.nabu.de/natur-und-landschaft/meere/offshore-windparks/33162.html>> accessed 11 September 2024.

¹⁵⁴² *ibid*.

¹⁵⁴³ *ibid*.

¹⁵⁴⁴ *ibid*.

cautionary lessons on the importance of prioritizing early and careful site selection using nature conservation criteria, alongside enhanced buffer zones for marine protected areas, to minimize the risks associated with OWE development.

5.2.2.3 Denmark’s Regulatory Framework for Offshore Wind Energy

5.2.2.3.1 General Remarks

Denmark is a unitary state with three separate powers: the legislature, the executive, and the judiciary.¹⁵⁴⁵ It is organized on a decentralized basis with three levels of governance including the State (the central administration), regional, and municipal administration.¹⁵⁴⁶ The municipalities have the right to manage affairs under their jurisdiction but under the State’s supervision.¹⁵⁴⁷

The political structure of Denmark has created a streamlined and transparent process for the development of OWE. Jurisdictional mandates and permitting procedures are regulated under the Promotion of Renewable Energy Act. According to this Act, the Danish State has the exclusive right to exploit wind energy in the territorial sea and the EEZ of Denmark.¹⁵⁴⁸ Establishing offshore wind in Denmark requires three licenses. Project developers must obtain such permits from the Danish Energy Agency, which is a “one-stop-shop” for planning and permitting. The licenses must be obtained for three purposes: i) License for performing preliminary investigations; ii) License for establishing

¹⁵⁴⁵ Anita Ronne, ‘Energy Law in Denmark’ in Martha Roggenkamp and others (eds), *Energy Law in Europe: National, EU and International Regulation* (Second Edition, 2007) 444.

¹⁵⁴⁶ ‘CoR - Denmark Introduction’ <<https://portal.cor.europa.eu/divisionpowers/Pages/Denmark-Introduction.aspx>> accessed 11 September 2024.

¹⁵⁴⁷ Ronne (n 1545) 445.

¹⁵⁴⁸ ‘Promotion of Renewable Energy Act- Unofficial Translation’ Act no. 1392 of 27 December 2008 s 22(1) <https://ens.dk/sites/ens.dk/files/Vindenergi/promotion_of_renewable_energy_act_-_extract.pdf> accessed 11 September 2024.

offshore wind turbines; and iii) License for exploiting power and electricity production.¹⁵⁴⁹
This permitting process reduces the regulatory burden for investors.

There are also two types of application procedures for the development of OWE in Denmark. In the “Open-door Procedure”, the project developer proposes site investigation, pays for grid connections to the land, and provides an outline of the project including the estimated scope of the preliminary investigation, the size and number of turbines, and the coordinates of the project.¹⁵⁵⁰ A license is not granted for areas previously designated for OWE in 2011.¹⁵⁵¹ In addition, the license is granted after examining the results of preliminary investigations.¹⁵⁵² The second type of granting a license is through a governmental call for tender, which is mostly used for the establishment of new wind farms.¹⁵⁵³ In the tender, the area for developing the offshore wind farm is defined and the farm must be established in the defined area.¹⁵⁵⁴ Notwithstanding the types of procedures, the project developer must obtain all three licenses mentioned above.¹⁵⁵⁵

It is a general condition that if a project may have adverse environmental effects, an EIA must be conducted. Offshore wind farms are subject to a case-by-case examination to determine the need for an EIA.¹⁵⁵⁶ In practice, an EIA has been conducted for all OWE

¹⁵⁴⁹ *ibid* ss 22, 25, and 29.

¹⁵⁵⁰ ‘Procedures and Permits for Offshore Wind Parks’ (*The Danish Energy Agency*, 17 June 2016) <<https://ens.dk/en/our-responsibilities/offshore-wind-power/offshore-procedures-permits>> accessed 11 September 2024.

¹⁵⁵¹ *ibid*.

¹⁵⁵² *ibid*.

¹⁵⁵³ *ibid*.

¹⁵⁵⁴ *ibid*.

¹⁵⁵⁵ *ibid*.

¹⁵⁵⁶ Helle Tegner Anker, ‘Renewable Energy Projects and Species Law- a Legal Comparative Research: Denmark’ in C Backes and S Akerboom (eds), *Renewable energy projects and species protection: a comparison into the application of the EU species regulation with respect to renewable energy projects in*

projects in Denmark.¹⁵⁵⁷ The obligation of the project developer under the tender procedure is less onerous than the open-door procedure. Before the tender, the Danish Energy Agency and Energinet (Danish Transmission System Operator) conduct SEA and preliminary investigation to specify areas suitable for OWE, specific details of a project, and the likely environmental impacts.¹⁵⁵⁸ After completion of the tender, the winner must undertake an EIA to obtain the license.¹⁵⁵⁹

Furthermore, EIA helps to understand whether the project will have any adverse impact on Danish Natura 2000 areas. Special Protection Areas designated under the EU Birds Directive and Special Areas of Conservation under the EU Habitats Directive, which are recognized as the Natura 2000, are protected under Danish law. These Directives are transposed into Danish law and the Danish Natura 2000 areas are designated by an executive order. The assessment of the environmental impacts of the project must be conducted in light of the conservation objectives set for these areas.¹⁵⁶⁰ If the project has significant impacts on the Danish Natura 2000 areas, the project cannot be authorized unless the project does not damage the integrity of these areas, there are imperative reasons for overriding public interest, no alternative solutions are available, and all compensatory measures are adopted.¹⁵⁶¹ It is considered in the public interest if it is necessary for human

the Netherlands, United Kingdom, Belgium, Denmark, and Germany (Utrecht Centre for Water, Oceans and Sustainability Law 2018) 266 <https://static-curis.ku.dk/portal/files/258090824/Renewable_energy_projects_and_species_law_a_legal_comparative_research_Denmark.pdf> accessed 7 March 2023.

¹⁵⁵⁷ ‘Procedures and Permits for Offshore Wind Parks’ (n 1550).

¹⁵⁵⁸ Danish Energy Agency, ‘Environmental Assessment of Offshore Windfarm Tenders’ 1–2 <https://ens.dk/sites/ens.dk/files/Vindmoller_hav/notes_on_ea_for_owf_tenders_dk.pdf> accessed 12 September 2024.

¹⁵⁵⁹ *ibid* 1.

¹⁵⁶⁰ ‘Promotion of Renewable Energy Act- Unofficial Translation’ (n 1548) s 27(1).

¹⁵⁶¹ *ibid* s 27(2).

health, and public safety, or to achieve beneficial consequences of primary importance for the environment.¹⁵⁶²

5.2.2.3.2 The Danish Law on Marine Spatial Planning

Denmark passed a law for MSP, establishing a framework for objectives, principles, and processes to achieve a dynamic plan. The Danish Parliament adopted the Maritime Spatial Planning Act in 2016, which aims to promote economic growth and the sustainable development of marine uses as well as contribute to achieving the goals of MSP.¹⁵⁶³ The Act expressly provides that it will not have any effect on the rights and jurisdiction of Denmark or other states over marine areas and the marine boundaries determined under international law.¹⁵⁶⁴ MSP is defined in this Act as ‘a process by which the relevant authorities analyze and organize human activities in marine areas to achieve economic, ecological, and social objectives’.¹⁵⁶⁵ Under this Act, MSP must cover internal waters, the territorial sea, and the EEZ.¹⁵⁶⁶ MSP aims to contribute to ‘the preservation, protection, and improvement of the environment, including resilience to the consequences of climate change’, as well as the sustainable development of various sectors including the energy sector.¹⁵⁶⁷ The Act requires that the Minister for Business and Growth adopt an ecosystem approach and the Minister considers the social, economic, and environmental conditions and safety aspects in the implementation of MSP.¹⁵⁶⁸ In the implementation of

¹⁵⁶² *ibid* s 27(4).

¹⁵⁶³ ‘Danish Act on Maritime Spatial Planning’ (n 1419) s 1.

¹⁵⁶⁴ *ibid* s 3.

¹⁵⁶⁵ *ibid* s 3(3).

¹⁵⁶⁶ *ibid* s 3(1) & (4).

¹⁵⁶⁷ *ibid* s 5(2).

¹⁵⁶⁸ *ibid* s 5(3).

MSP, the specific conditions of each marine region, ‘the relevant existing and future activities and uses and their impact on the environment and natural resources’ and “land-sea interaction” must be taken into account.¹⁵⁶⁹ The coexistence of current and future activities and interests must be considered.¹⁵⁷⁰

The legal effect of MSP is that permission for installations or uses cannot be granted if they contradict MSP.¹⁵⁷¹ If they do, necessary and urgent measures must be taken, enforcement notices must be issued, and safety systems must be established.¹⁵⁷² Denmark has published the legally binding maritime spatial plan after public consultation, EIA, and SEA.¹⁵⁷³ This map is constantly updated through a dynamic process, creating a dialogue between authorities and updating data.¹⁵⁷⁴

Several regulations apply to marine activities in different sectors such as the operation of fisheries and electricity supply. There are designated zones under this MSP for renewable energy. The designation of zones for renewable energy does not impose any restrictions on the access of other uses such as fishing and navigation and does not restrict other rules on environmental protection.¹⁵⁷⁵

Denmark has established a comprehensive regulatory framework aimed at streamlining the permitting process for various projects, particularly in the OWE sector.

¹⁵⁶⁹ *ibid* s 6.

¹⁵⁷⁰ *ibid* s 8.

¹⁵⁷¹ *ibid* s 14.

¹⁵⁷² *ibid* s 14 & 16.

¹⁵⁷³ ‘Danmarks Havplan’ <<https://havplan.dk/en/page/info>> accessed 12 September 2024; ‘Denmark | The European Maritime Spatial Planning Platform’ <<https://maritime-spatial-planning.ec.europa.eu/countries/denmark>> accessed 12 September 2024.

¹⁵⁷⁴ Danish Energy Agency, ‘Offshore Wind Development’ (2022) 21 <https://ens.dk/sites/ens.dk/files/Vindenergi/offshore_wind_development_final_june_2022.pdf> accessed 14 November 2022.

¹⁵⁷⁵ ‘Danmarks Havplan’ <<https://havplan.dk/en/page/search>> accessed 31 August 2024.

This framework employs a one-stop-shop approach, which simplifies the application process for developers by allowing them to access all necessary approvals and permits through a single point of contact. This method not only enhances efficiency but also reduces administrative burdens on both the authorities and project developers.

Moreover, all projects are required to undergo thorough environmental assessments, which are integral to the permitting process. These assessments are designed to evaluate the potential impacts of proposed projects on the marine environment, ensuring that ecological considerations are taken into account before any development proceeds.

In addition to this permitting process, Denmark has implemented a comprehensive MSP. This planning initiative is codified under national law and serves to effectively manage the use of marine spaces, minimizing conflicts between offshore wind energy installations and other marine activities, such as fishing, shipping, and recreation.

5.3 Lessons Learned from Selected Jurisdictions

The EU guidelines and the regulatory frameworks for OWE in the UK, Germany, and Denmark share common principles and practices that offer some lessons on how to advance renewable energy goals through OWE while safeguarding marine ecosystems and addressing competing uses. These shared elements highlight the importance of developing the renewable energy transition with the protection of marine ecosystems and the accommodation of other marine uses and can guide Canada on its path to developing OWE.

5.3.1 The Effects of Policies on Renewable Energy Targets

Clear and robust policies based on needs, priorities, and environmental limits enlighten the role of OWE in a sustainable future. As discussed, the regulatory frameworks

of the selected jurisdictions are influenced by policies.¹⁵⁷⁶ The provision of TFEU reflects the EU's policy objectives of energy security and preservation of the environment. The 2018 Renewable Energy Directive establishes a target of 32 percent of energy from renewable sources in the overall energy consumption by 2030. Each jurisdiction must adhere to EU Directives which serve as the primary drivers for national energy policies, while still retaining the discretion to determine the specific implementation methods and circumstances. An example of how differently jurisdictions implement the EU Directives is their various targets for the development of OWE and their commitment to address climate change and energy security.¹⁵⁷⁷ For instance, the UK aims to achieve up to 50 gigawatts of offshore wind by 2030 as part of its energy security strategy, while Germany has set statutory targets for OWE of at least 30 gigawatts by 2030, 40 gigawatts by 2035, and 70 gigawatts by 2045.

5.3.2 Adopting Precautionary Principle for Protecting Birds

Although the interpretation of the Birds Directive and Habitats Directives may vary from one jurisdiction to another, authorities tend to adopt the precautionary principle. In Germany, proving the deliberate killing of birds is not required, but if an activity causes a “significant” increase in mortality risk, it is interpreted that such an activity is prohibited due to the “deliberate killing” of birds.¹⁵⁷⁸ The UK has also adopted a precautionary approach, which is a consideration of reckless disregard. It means that killing is deliberate

¹⁵⁷⁶ A similar conclusion is drawn by other comparative studies; see, for example, Nicolas Boillet and Gaëlle Guéguen-Hallouët, ‘A Comparative Study of Offshore Renewable Energy Legal Frameworks in France and the United Kingdom’ (2016) 30 *Ocean Yearbook Online* 382.

¹⁵⁷⁷ IRENA, ‘30 Years of Policies for Wind Energy Lessons from 12 Wind Energy Markets’ (n 101) 28.

¹⁵⁷⁸ Helle Tegner Anker and others, ‘Wind Energy Projects and Species Protection Law: A Comparative Analysis of the Application of EU Law in Five Member States’ (2019) 28 *European Energy and Environmental Law Review* 144, 149.

when a developer fails to cooperate with authorities to consider mitigation measures once the killing is identified at the site.¹⁵⁷⁹

5.3.3 Centralized and Streamlined (One-stop-shop) Approach for Permitting Processes

All three jurisdictions employ centralized permitting systems to streamline the approval process, attracting investment in the renewable energy sector, while reducing regulatory complexity and fostering efficiency. The goal is to incentivize the transition towards decarbonization, but the centralization also allows better control of regulatory frameworks to address environmental impacts. For instance, the UK has implemented a centralized permitting system where major project permits are issued by the planning authority and the seabed ownership authority. Similarly, Germany has a federal system where federal laws apply to its territorial sea and the EEZ, and the federal government is responsible for granting permits for OWE. BSH serves as a single authority, conducting EIA and acting as a “one-stop-shop” to streamline the permitting process while integrating environmental safeguards and spatial planning to balance OWE development with biodiversity protection and other marine uses. Likewise, the Danish Energy Agency, acting as a “one-stop-shop” for planning and permitting, authorizes OWE projects under the law. Moreover, additional assistance could be offered to developers. Potential sites could be identified in advance through initial assessments, EIA, and SEA. For instance, in Denmark, developers face fewer challenges in the process because the areas have already been researched and specified in tender documents. However, it is essential to emphasize that

¹⁵⁷⁹ *ibid.*

this does not exempt the developer from completing the full EIA to obtain the necessary permit.

A marked example of developing OWE through streamlined processes is Scotland. It has been ambitious in terms of political commitments towards decarbonization with the defined level of development, organizational integration, and support mechanisms, which provide investors with a good prospect and increase their confidence. For example, after a developer submits its development application, Marine Scotland has a nine-month determination process.¹⁵⁸⁰ In addition, the one-stop shop as a clear line of contact provides a streamlined decision-making process, organizational efficiency, enhanced integration, and a network approach that includes other marine sectors.¹⁵⁸¹ Scotland also has Marine Scotland's Scottish Marine Energy Research program, which consists of representatives from industry, environmental NGOs, Statutory Nature Conservation Bodies, and interested stakeholders and informs and assists decision-making. It also enjoys the Offshore Wind Growth Partnership, which was established as part of the UK offshore wind sector deal and supports the local content and supply chain, which is one of the challenging areas.¹⁵⁸²

5.3.4. Strict Conditions to Conserve Natura 2000 against Environmental Impact of OWE

Due to the environmental impacts of OWE, it is necessary that states also take appropriate measures to protect the environment. Under the EU Birds and Habitats Directives, they must establish Natura 2000 and prohibit certain activities such as killing

¹⁵⁸⁰ Zoë O'Hanlon and Valerie Cummins, 'A Comparative Insight of Irish and Scottish Regulatory Frameworks for Offshore Wind Energy – An Expert Perspective' (2020) 117 *Marine Policy* 8.

¹⁵⁸¹ *ibid* 7–10.

¹⁵⁸² *ibid* 10.

and disturbance of protected species, deterioration or destruction of their habitats, deterioration of waters, and the discharge of substances into water.

There are exceptional circumstances and under the satisfaction of certain conditions that prohibitions can be derogated. For example, the Birds Directive only authorizes derogation under strict monitoring for a small number of birds based on a permit. For authorizing projects that have adverse effects, they need to verify that there is no satisfactory alternative, that derogation is not detrimental to the maintenance of the population of species, and that derogation should serve the public health and safety, or be necessary for overriding public interest, such as social or economic benefits and positive environmental impact. In practice, Germany, the UK, and Denmark have not provided any explicit derogation from the prohibition of the Birds Directive and Habitats Directive.¹⁵⁸³ For instance, Germany requires conducting EIA and taking preventive and mitigation measures in case of significant adverse effects on the population of protected species.¹⁵⁸⁴ The Netherlands, which is not a jurisdiction under consideration, provides the possibility to apply for derogation based on the reasoning that wind projects contribute to cutting GHG emissions and have positive effects on the climate system.¹⁵⁸⁵

5.3.5 Using SEA and EIA to Assess Impacts

SEAs and EIAs are integral to identifying suitable sites for OWE development and minimizing environmental impacts in all three countries. These assessments evaluate ecological, social, and economic factors, with particular attention to protected areas and biodiversity. For example, SEA is a common tool to consider the impacts of plans and

¹⁵⁸³ Anker and others (n 1578) 149.

¹⁵⁸⁴ *ibid.*

¹⁵⁸⁵ *ibid.*

programs. Various factors should be considered in the decision-making processes when integrating OWE projects into policies and programs. These include assessing the potential effects of OWE on other projects, determining the relevance of OWE to environmental plans and programs, and establishing guidelines for the inclusion or exclusion of OWE in plans and policies. Additionally, setting environmental limits for OWE, evaluating the nature and scale of its effects, including cumulative and transboundary effects, and considering its impact on protected areas are all crucial aspects to be considered.

Another common tool for project-level assessment is EIA. In EIA, some criteria must be used to assess the effects of OWE projects. Such criteria include the size of OWE project, the cumulative effects of OWE projects with other projects in marine areas, the pollution or introduction of harmful substances into marine waters, the risk of accidents between OWE projects and shipping, the environmental effects on marine protected areas, environmental quality standards, the impact on landscapes of significance, the nature, magnitude, probability, duration, frequency, complexity, and reversibility of effects.

Canada should embrace advanced analytical tools designed to assess the impacts of OWE projects, including cumulative effects. This approach should focus on thoroughly examining how these developments might affect ecosystems, fish populations, and the habitats they rely on. By prioritizing the preservation of these vital components, Canada can ensure that its OWE initiatives align with the principles of ecosystem-based management. This strategy not only promotes sustainable development but also safeguards the biodiversity essential for maintaining healthy aquatic environments.

5.3.6 Promoting MSP in the EU and National Laws and Policies

The UK, Germany, and Denmark all integrate MSP into their regulatory frameworks, using it to designate zones for OWE development while balancing competing marine uses such as fishing, shipping, and conservation of the environment. MSP ensures that marine activities are harmonized and that renewable energy projects are developed in areas with minimal conflict and ecological sensitivity. Canada could benefit from a similar approach by adopting dynamic and mandatory MSP processes that allow for adaptive management and stakeholder engagement.

The lesson that can be learned from the UK MSP is that centralized management is crucial in forming the MSP. Under the law, the UK prepared a national policy with a collaborative approach from all administrations in the UK. The benefit of this policy statement is that it covers all marine areas to be planned, hence no area will remain untouched. In addition, all possible marine areas throughout the UK are included. Each administration prepares its marine plan in line with the UK's policy. This regulatory strategy creates some level of coordination and integrity between the laws and policies of each administration and the UK's policy. At the same time, it gives sufficient discretion to each administration to assess the social, economic, and ecological factors of its marine areas and to adopt a marine plan that addresses the current and future opportunities and challenges in that particular marine area.

In addition to an overall integrated plan, sectoral policies and plans for OWE are very important. The UK and Germany's MSPs designate priority areas for OWE to ensure the plans in specific zones are protected from other plans or development activities unless the OWE plan is changed for specific reasons. Some preferred zones might also be designated as areas where OWE development is considered favourably. In these areas,

other activities may be prioritized over the development of OWE based on the revised objectives of the plan. Furthermore, in priority areas for OWE, other marine uses that are not compatible with OWE may not be permitted to carry out activities. Multi-use is, however, permitted under Denmark's MSPs. In Denmark, generally, the designation of zones for renewable energy does not impose any restrictions on the access of other uses such as fishing and navigation.

There should be a binding statutory obligation on authorities to create MSP. In Denmark, MSP establishment is through an Act of Parliament. The Act states that upon establishing the plan out of MSP, all activities must not be in contradiction with the plan. It does not mean that the plan is inflexible. It is an evolving plan, which can be changed through consultation and engagement processes defined under the law.

Finally, it should be noted that there is a limit for MSP in balancing different economic, social, and ecological objectives. Balance of objectives should not compromise the good environmental status and the capacity of ecosystems. In addition, MSP is not just a plan. It should be inclusive of all marine activities and new developments while achieving environmental objectives. Indeed, it is a challenging task that should be done through iterative public and stakeholder consultation and appraisals.

5.3.7 Avoiding any Compromise of Ecosystem Resilience

Each country emphasizes the protection of marine biodiversity through measures such as Natura 2000 networks in Germany and Denmark and the Marine Conservation Zones in the UK. They enforce strict conditions on OWE projects to ensure compatibility with conservation objectives and require mitigation and then compensatory measures when adverse impacts cannot be avoided.

Canada can draw on these practices to align its OWE projects with biodiversity protection commitments and avoid critical ecological areas. The overall status of the marine environment must be good to achieve or maintain a clean, healthy, and resilient environment for current and future generations. To maintain a good environmental status, environmental targets must be set. Project developments such as OWE development must not prevent, undermine, or compromise these targets. Any project that hinders the objectives of the network of special areas of conservation and special protection areas or adversely affects their integrity must not be approved. If the project developer cannot demonstrate that the project does not hinder the targets for protected areas or species, the project developer must satisfy the authority that there is no other alternative location to lower the risk of damage by the activity to the environment. The benefit of the project for the public must outweigh the damage to the environment and to rectify this damage, measures to the interest of the environment must be taken. For assessing environmental impacts and compensatory measures, a marine recovery fund can be established to ensure that compensatory measures are taken for the coherence and integrity of protected areas. Furthermore, OWE sites must be selected appropriately. They should be selected based on nature conservation criteria, a carefully conducted EIA, anticipation of effects, and effective preventive and mitigation measures.

5.3.8 Stakeholder Engagement

The jurisdictions under consideration have highlighted the critical role of engaging various stakeholders, including members of the fishing industry and local communities, to effectively address conflicts and promote coexistence among different user groups. For instance, the FLOWW initiative in the UK exemplifies a structured approach to stakeholder

engagement, fostering open dialogue and collaboration among developers and fishermen. Similarly, Denmark's development of integrated multi-use zones serves as a practical model for balancing competing interests, allowing for sustainable fishing practices alongside recreational and conservation efforts.

In light of these examples, Canada could greatly benefit from adopting analogous frameworks that encourage equitable and inclusive participation in the decision-making process. By creating platforms for open communication and partnership among all stakeholders, Canada can address the socio-economic impacts of OWE management more effectively. This could involve establishing advisory boards or forums that represent diverse interests, ensuring that the voices of local communities and industry representatives are heard and considered in policy development. Such an approach would not only enhance collaboration but also contribute to more sustainable and accepted management practices in Canada's marine environments.

5.3.9 Adaptive Management

Adaptive and forward-looking management represents a crucial lesson emerging from the regulatory practices observed in the jurisdictions under consideration. The regulatory frameworks implemented in Denmark, Germany, and the UK emphasize the importance of adaptive management and aim to create dynamic MSPs. These frameworks are designed to facilitate continuous updates, enabling them to integrate new environmental data, advancements in technology, and evolving stakeholder perspectives. For instance, in Denmark, regulatory authorities are empowered by law to regularly revise the MSP to ensure they remain relevant and effective in addressing contemporary issues. This proactive approach allows for adjustments based on the latest scientific research and

environmental assessments, thereby enhancing the resilience and sustainability of marine ecosystems.

Similarly, both Germany and the UK have integrated adaptive monitoring systems within their regulatory frameworks. These systems provide real-time feedback on the effectiveness of management strategies and environmental conditions, which in turn supports informed decision-making and timely interventions when necessary.

Canada could significantly benefit from adopting similar adaptive strategies. By implementing flexible management approaches that can appropriately respond to shifting environmental conditions and diverse stakeholder needs, Canada would enhance its ability to manage marine resources sustainably. This kind of forward-thinking regulatory framework would not only improve conservation efforts but also promote a more collaborative and responsive governance model for MSP.

5.4 Conclusion

The UK, Germany, and Denmark have each established regulatory frameworks for OWE that aim to both foster the growth of the sector and mitigate its environmental impacts. A key feature of these frameworks is the implementation of centralized permitting systems, which streamline the approval process for OWE projects, ensuring that development is both efficient and coordinated. The use of EIA for offshore wind projects has been also crucial in identifying potential risks to Natura 2000 sites, which are designated areas of high ecological value across the EU.

The jurisdictions under consideration have facilitated the effective management of conflicts between various marine uses, such as shipping, fishing, and conservation, through the mandatory process of MSP. By integrating OWE into the spatial plans, these

jurisdictions could balance the demand for renewable energy with the need to protect sensitive marine ecosystems. Moreover, the incorporation of OWE into sectoral plans under MSP ensures that the growth of offshore wind is carefully managed in a way that minimizes disruptions to other marine activities while supporting long-term sustainability. The design of these plans takes into account the spatial distribution of marine activities and habitats, enhancing the overall coherence of marine management. While it is imperative to prevent harm to marine environments from offshore wind activities, the concept of a recovery fund offers a proactive solution to compensate for any unavoidable environmental damage. Such a fund would provide financial resources for restoring ecosystems or addressing adverse impacts, ensuring that the development of OWE contributes to both climate goals and the protection of marine biodiversity.

The table below provides a comparative summary of key issues at the EU level and within each national jurisdiction.

Table 5- The Comparison of Case Studies on the EU and National Regulatory Frameworks

Comparison Issues	EU	UK	Germany	Denmark
Importance of Policy Targets for setting targets to expand OWE/ Renewable Energy	32 percent of energy from renewable sources in the overall EU energy consumption by 2030	50 gigawatts of offshore wind by 2030, including 5 GW from innovative floating technology	30 gigawatts by 2030, 40 gigawatts by 2035, and 70 gigawatts by 2045	12.9 gigawatts of offshore wind by 2030

Centralized Permitting Process	NA	Planning Inspectorate as a central licensing authority for projects of more than 100 megawatts and the Crown Estate as a seabed licensing authority for England, Northern Ireland, and Wales, and Crown Scotland for Scotland	The Federal Maritime and Hydrographic Agency (BSH) for OWE development in the EEZ	The Danish Energy Agency as a “one-stop-shop” for planning and permitting
Using SEA/EIA	The Strategic Environmental Assessment Directive and Environmental Impact Assessment Directive set criteria for determining the likely significance of the effects of plans/programs and whether the project should be subject to assessment	Conducting EIA and Habitats Regulations Assessments by project developers, examined by competent authority to assess the impacts particularly the impacts on Special Areas of Conservation, Special Protection Areas, and marine wildlife	SEA for suitability of OWE sites and EIA for planning projects and their impacts on species and their habitats EIA are required for a wind farm project consisting of 20 or more wind turbines and an overall height of 50 meters	Conducting SEA by the Danish Energy Agency and Energinet (Danish Transmission System Operator) conduct, and EIA must be conducted by the winner of the tender
Promoting MSP	The MSP Directive requires every Member State to establish an MSP	i) Creating a national policy statement for MSP based on the law, establishing integration and coordination	MSP for the German EEZ of the North Sea and the Baltic Sea is established under the law.	MSP is established under an Act of Parliament. It is an evolving plan changing through

<p>between UK administrations</p> <p>ii) Creating overall integrated plan sectoral policies and plans under MSP</p> <p>iii) establishing preferred zones for OWE in the plans</p>	<p>Priority areas are designated for OWE projects. Multi-use is allowed. Some areas might also be designated as reservation areas for further expansion</p>	<p>consultation and engagement processes. Multi-use is allowed.</p>
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<p>Conditions for derogation from protection of species / their habitats / natura 2000 or additional protective measures</p>	<p>i) The absence of any satisfactory alternative, ii) No detrimental effect on the maintenance of the population of the species, iii) The necessity to protect the public interest, iv) Undertaking monitoring / strict supervision conditions, v) Applying other conditions in the permit.</p>	<p>In addition to EU conditions, other measures include</p> <p>i) Adopting strategic compensation for adverse environmental effects, ii) Establishing a marine recovery fund, iii) Securing compensation measures about the adverse environmental effects of OWE on protected sites, iv) Imposing no significant risk of hindering the achievement of the objectives set for the Marine Conservation Zones.</p>	<p>In addition to EU conditions, other measures include offsetting through compensation measures (restoring the impaired functions of natural balance), substitution measures, or where offset is not possible, monetary substitution.</p>	<p>Conditions under the EU directives are reiterated in the national law.</p>
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CHAPTER SIX- CONCLUSION

The discussions and analyses presented in this thesis outline a path for improving the legal and policy framework in Canada, drawing from literature, international law, and practices in other countries to promote OWE development that is ecologically sustainable. The research emphasized the need for a regulatory framework that is responsive to the ecological impacts of OWE and maintains ecological integrity. To be clear, this thesis does not assert that its recommendations will guarantee ecological sustainability in OWE development in Canada. Achieving ecological sustainability involves multiple factors. For example, a regulatory response must be complemented by enriching relevant scientific knowledge. It should also be adaptable, evolving in response to updated scientific findings, monitoring results, technological advancements, and changes in marine conditions. The science and policy interface and adaptability should in fact be embedded in the regulatory framework to help promote ecological sustainability.

In light of principles, rules, and guidelines from international law, and informed by lessons learned from comparative jurisdictions, this final chapter offers key directions for the future of OWE law and policy in Canada to advance the critical environmental objective of mitigating GHG emissions to address climate change, while safeguarding other vital environmental priorities, such as ecosystem health and biodiversity protection. This chapter provides guidance on developing legal and policy frameworks based on ecological sustainability by enhancing MSP, implementing ecologically robust SEA and EIA, strengthening OWE pollution understandings and controls, and managing conflicts with shipping and fishing sectors. This chapter also provides specific recommendations about amending key federal and provincial laws and regulations or taking regulatory initiatives

to enhance environmental protection in the context of OWE development. In addition, the chapter raises some remaining questions for further research. Finally, it concludes with a concise conclusion.

6.1 Embracing Ecological Sustainability in the Regulatory Framework

Ecological sustainability as a theoretical framework can contribute significantly to developing an appropriate regulatory framework for OWE in Canada. The primary aim of considering ecological sustainability is to ensure that laws and policies contain rules prohibiting harm to ecological integrity.¹⁵⁸⁶ In other words, OWE regulation should prioritize ecological integrity as a non-negotiable baseline for law-making and decision-making. This means ensuring that OWE projects do not compromise marine ecosystem health, biodiversity, or the functioning of natural processes, even while addressing the critical goal of GHG emissions reduction. More specifically, placing ecological integrity at the center signifies that OWE law and policy should aim to conserve biotic and abiotic components, their structures, the composition and abundance of native species and biological communities, and their natural function and processes.

As discussed, there are references to ecological integrity in the Canada National Parks Act¹⁵⁸⁷ and the Oceans Act¹⁵⁸⁸. However, these references have limited applications. Maintaining or restoring ecological integrity is not a benchmark to assess activities in these Acts, but it is a reason for establishing management plans or marine protected areas. These references may set spatial limitations for activities such as OWE so that they do not fall

¹⁵⁸⁶ Bosselmann, 'The Framework of Ecological Law' (n 292) 479.

¹⁵⁸⁷ The Canada National Parks Act (n 244) s 2(1).

¹⁵⁸⁸ Oceans Act (n 246) s 35(1)(1.1).

within those protected areas or undermine management objectives, however, these references do not provide a benchmark to examine projects. This limitation should be overcome by including this benchmark to avoid compromising ecological integrity in OWE project approvals.

Based on ecological sustainability, the benefits of OWE to the climate system (through reducing GHG emissions) and to ecosystems (such as creating artificial reefs) cannot justify a “green regulatory pass” for this technology. It is essential to evaluate whether the activities of OWE projects - both individually and in combination with other activities - diminish the ecological integrity of a site or an ecosystem.

Ecological sustainability highlights the importance of science in guiding environmental laws and policies. Human beings rely on scientific research to understand and protect ecological integrity. Science provides the tools to assess the biological conditions of ecosystems, establish baseline conditions and metrics, and analyze key elements related to ecosystem functioning, productivity, structure, and processes. This scientific understanding is critical for determining the resilience of ecosystems to external shocks and identifying thresholds where human-induced pressures may compromise ecological integrity. The integration of such knowledge into OWE regulatory frameworks ensures that they are grounded in evidence, allowing for informed decision-making that balances OWE activities with the need to safeguard ecosystem health and resilience.

Holistic, robust, and cohesive environmental laws and policies are also essential to fostering ecological sustainability. Fragmented legal frameworks that separately address species at risk, fisheries, migratory birds, and other ecosystem components are not adequate from this perspective. A comprehensive approach that prioritizes the conservation of entire

ecosystems or their integrity is necessary. Applying this approach would require regulators to assess the impacts of OWE development, both individually and in combination with other marine activities, to maintain the integrity of marine systems. This holistic perspective aligns with MSP and SEA which prioritize interconnectedness and ecological limits. It would also help prevent further consequences of climate change and biodiversity loss, which have been exacerbated by historically isolated and fragmented legal approaches.

The complexities of ecosystems may hinder the development of full scientific certainty about ecological integrity. Ecosystems are complex because it is hard to understand the interactions between their components and the full effects of human activities on the whole ecosystem and their components.¹⁵⁸⁹ They are dynamic and evolve as a result of natural disturbances and pressures from human activities.¹⁵⁹⁰ Ecosystems are also non-linear as there are not always direct and linear effects from the activities, making it hard to predict the effects of an activity, particularly when they are combined with the effects of other activities.¹⁵⁹¹ In this context, ecological sustainability necessitates that OWE regulations are guided by the precautionary principle.

Due to the potentially significant environmental effects of OWE in the complex world of ecosystems, the precautionary principle can play a critical role in protecting ecological integrity. According to this principle,

¹⁵⁸⁹ Woolley, *Ecological Governance: Reappraising Law's Role in Protecting Ecosystem Functionality* (n 262) 162.

¹⁵⁹⁰ *ibid.*

¹⁵⁹¹ *ibid.*

[W]here there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.¹⁵⁹²

This principle is particularly important where there are marine protected areas, management objectives, and recovery plans to conserve an ecosystem or a component such as species at risk. The OWE projects will likely undermine these objectives and plans by causing the death or displacement of fish, destroying the habitat of fish or species at risk, and changing the composition of fish. In this situation, protecting the ecological integrity of ecosystems requires the intervention of law through the application of the precautionary principle. It is understood from the provision of the Habitats Directive¹⁵⁹³ and the decisions of the European Court of Justice¹⁵⁹⁴ that in case of scientific uncertainty, an assessment must be undertaken. If the assessment identifies potential adverse effects of a project on the integrity of a special conservation area, it should be enough to disapprove that project, even if the harm is not significant. In other words, there should be no reasonable scientific doubt that adverse effects on the integrity of protected areas are absent to approve a project. The Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia also considered the precautionary approach by defining a 25-kilometer buffer from the coast and around Sable Island where no OWE should be developed to avoid any conflict with fisheries, migratory bird corridors, bats, shipping, and visual impacts.¹⁵⁹⁵

¹⁵⁹² Convention on Biological Diversity (n 1099) preamble.

¹⁵⁹³ Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (n 280) art 6(3).

¹⁵⁹⁴ *Case C-127/02 Landelijke Vereniging Tot Behoud van de Waddenzee and Nederlandse Vereniging Tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer En Visserij* [2004] ECR I-7405 (n 282); *Case C-258/11 Peter Sweetman and Others v An Bord Pleanála* [2013] General (n 284).

¹⁵⁹⁵ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 241.

The comparative study, however, adds an exception. For example, under the EU Habitats Directive, derogation is permitted if there is no satisfactory alternative and derogation is not detrimental to the maintenance of the population of the species.¹⁵⁹⁶ Such derogation must be for acceptable reason identified under the Habitats Directive, i.e.,

[I]n the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.¹⁵⁹⁷

While this broad derogation is not helpful in light of ecological sustainability, further conditions understood from national laws reduce the granted discretion under this broad exception. For example, it is understood from national laws under comparative law that strict supervision or monitoring and mitigation measures must be employed¹⁵⁹⁸ and all mitigation and compensatory measures must be adopted.¹⁵⁹⁹

6.2 Advancing MSP

MSP is a participatory process that should be recognized under the law to promote ecological sustainability. There have been initiatives under different policies and plans such as the Blue Economy Regulatory Roadmap¹⁶⁰⁰, but these initiatives are not effective largely due to the absence of a binding statutory obligation requiring authorities to establish MSP. As highlighted in a review of other jurisdictions, the EU addressed this issue through

¹⁵⁹⁶ Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (n 280) art 16(1).

¹⁵⁹⁷ *ibid* art 16(1)(c).

¹⁵⁹⁸ The Conservation of Offshore Marine Habitats and Species Regulations 2017 (n 1495) s 55(4).

¹⁵⁹⁹ ‘Promotion of Renewable Energy Act- Unofficial Translation’ (n 1548) s 27(2).

¹⁶⁰⁰ Fisheries and Oceans Canada, ‘Blue Economy Regulatory Roadmap’ (n 647).

the MSP Directive, mandating Member States to implement MSP to ensure the sustainability of marine activities.¹⁶⁰¹ Countries such as the UK¹⁶⁰², Germany¹⁶⁰³, and Denmark¹⁶⁰⁴ have integrated MSP into their legal frameworks and developed plans guided by MSP principles. In Denmark, MSP is governed by an Act that sets out objectives, principles, and processes to create an inclusive and dynamic plan.¹⁶⁰⁵ The Act states that upon establishing the plan out of MSP, all activities must align with the plan.¹⁶⁰⁶ The Act also accommodates flexibility. The plan is evolving, which can be changed through consultation and engagement processes defined under the Act. The administrations in the UK (e.g. England, Wales, Ireland, and Scotland) have also achieved plans through MSP.¹⁶⁰⁷ Such plans include a set of policy objectives, principles, sectoral plans, and designated areas for different purposes such as OWE, and rules for the resolution of conflicts between different sectors.

Similarly, Canada could amend the Oceans Act to mandate authorities to establish MSP, making it legally effective and enforceable. It must ensure that the public and all stakeholders are actively involved in the process resulting in a legally binding plan that has been agreed upon by all parties. Such legislation should require that plans be implemented using science-based knowledge and revised as necessary to remain effective and

¹⁶⁰¹ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 Establishing a Framework for Maritime Spatial Planning (n 1399).

¹⁶⁰² For example, Marine (Scotland) Act sub-s 5(1).

¹⁶⁰³ Ordinance on Spatial Planning in the German Exclusive Economic Zone in the North Sea and the Baltic Sea (n 1532) s 1.

¹⁶⁰⁴ Danish Act on Maritime Spatial Planning (n 1419).

¹⁶⁰⁵ *ibid* s 1.

¹⁶⁰⁶ *ibid* s 14.

¹⁶⁰⁷ For example, Marine (Scotland) Act sub-s 5(1); The Scottish Government, ‘Scotland’s National Marine Plan - A Single Framework for Managing Our Seas - A Summary of Objectives and Policies’ <<https://www.gov.scot/publications/scotlands-national-marine-plan/>> accessed 5 August 2022.

relevant.¹⁶⁰⁸ Materializing MSP through law is not a prescriptive task but it requires extensive exploration of needs and circumstances and examination of relevant laws, policies, and administrations.¹⁶⁰⁹

Amendment of the Oceans Act to establish MSP should include consideration of certain characteristics. First, MSP should be formulated as a tool that applies the ecosystem approach.¹⁶¹⁰ Adopting this approach is critical as it helps biodiversity be included in the plan. An integrated and biodiversity-inclusive spatial planning and effective management processes covering all areas will reduce the risk of losing areas of high biodiversity importance (e.g. ecosystems of high ecological integrity). Using the ecosystem approach, scientific and traditional data and information are analyzed regularly to understand and manage marine activities, their interactions, and the potential conflicts between uses and the environment. Scientific biological knowledge related to the structure, processes, functions, and interactions among organisms and their environment should be involved. Adaptive management should be employed to anticipate and adapt to ecosystem conditions and make decisions that mitigate the effects of OWE while being cautious that decisions do not prevent flexibility and the use of other available options.¹⁶¹¹ The ecosystem approach also reinforces an “all-inclusive” method that involves the public and all actors.¹⁶¹²

¹⁶⁰⁸ ‘Designing Marine Spatial Planning Legislation for Implementation: A Guide for Legal Drafters’ (Blue Prosperity Coalition 2020) 7 <<https://primarysources.brillonline.com/browse/climate-change-and-law-collection/designing-marine-spatial-planning-legislation-for-implementation-a-guide-for-legal-drafters;cccc0191202001911089>> accessed 14 October 2024.

¹⁶⁰⁹ *ibid* 8.

¹⁶¹⁰ The Conference of the Parties to the Convention on Biological Diversity, ‘The Ecosystem Approach’ (n 1111) para 1.

¹⁶¹¹ *ibid* para 6, principle 9.

¹⁶¹² *ibid* para 6, principles 11, 12.

Second, an integrated approach to planning marine areas and resources is essential based on the lessons learned from the selected jurisdictions. The benefit of this approach is that it covered all marine areas to be planned, hence no area remained untouched.¹⁶¹³ All possible marine areas throughout the UK were included. Each administration in the UK prepared its marine plan in line with the UK's national statement. This regulatory strategy creates some level of coordination and integrity between the laws and policies of each administration and the UK's national statement. At the same time, it gives sufficient discretion to each administration to assess the social, economic, and ecological factors of its marine areas and to adopt a marine plan that addresses the current and future opportunities and challenges in that particular marine area.

Third, Canada which has a federal system should ensure that a federal-provincial cooperative framework is made so that MSP includes both federal and provincial jurisdictions, particularly protected areas. MSP can build on and update the national and regional plans and policies (e.g. Canada's Oceans Strategy and Regional Oceans Plan – Scotian Shelf, Atlantic Coast, Bay of Fundy)¹⁶¹⁴ to inform the planning of activities. The current and potential plans related to marine protected areas (e.g. Oceans Act Marine Protected Areas, Marine Wildlife Areas, National Marine Conservation Areas, Migratory Bird Sanctuaries, National Wildlife Areas, and National Parks, and their network) must be included in MSP so that they are not affected by OWE activities. The Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia also recommends

¹⁶¹³ 'UK Marine Policy Statement' (n 1439).

¹⁶¹⁴ Department of Fisheries and Oceans Canada (n 625) 9.

supporting the ongoing research by federal authorities to create a comprehensive and adaptable marine spatial plan.¹⁶¹⁵

Fourth, in addition to an overall integrated plan, sectoral policies and plans for OWE are very critical. The UK and Germany's MSPs designate priority areas for OWE to ensure the plans in specific zones are protected from other plans or development activities unless the OWE plan is changed for specific reasons. Some preferred zones might also be designated as areas where OWE development is considered favorably.¹⁶¹⁶ In these areas, other activities may be prioritized over the development of OWE based on the revised objectives of the plan. Furthermore, in priority areas for OWE, other marine uses that are not compatible with OWE may not be permitted. Multi-use is, however, permitted under Denmark's MSPs. In Denmark, generally, the designation of zones for renewable energy does not impose any restrictions on the access of other uses such as fishing and navigation.¹⁶¹⁷

Fifth, relevant laws and regulations should also be reviewed to make sure that all sectors are connected to MSP appropriately. For example, for OWE projects (and future oil and gas developments), the memorandum of understanding for coordination among various levels of authorities used in the Canada-Nova Scotia Offshore Petroleum Resources Implementation Act,¹⁶¹⁸ which is the underlying Act for the 2024 Act, is not appropriate. This tool has general contents and fails to provide details on how projects are planned in marine areas and obtain regulatory approvals. MSP should be incorporated in the 2024 Act

¹⁶¹⁵ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 369.

¹⁶¹⁶ 'East Inshore and East Offshore Marine Plans' (n 1445) 122.

¹⁶¹⁷ 'Danmarks Havplan' (n 1575).

¹⁶¹⁸ 'Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act' (n 67) s 46.

and be applied to integrate OWE into the management of all activities in the marine environment.

Finally, it should be noted that there is a limit for MSP in balancing different economic, social, and ecological objectives. Balance of objectives should not compromise the good environmental status and the ecological integrity of ecosystems. The overall status of the marine environment must be good to achieve or maintain a clean, healthy, and resilient environment for current and future generations. To maintain a good environmental status, environmental targets must be set and project developments such as OWE development must not prevent, undermine, or compromise these targets.

6.3 Ensuring Ecologically Robust SEAs and EIAs

Under international law, as stated by the Advisory Opinion of ITLOS, it can be said that there is a direct obligation to conduct an EIA under UNCLOS and a general obligation under customary international law.¹⁶¹⁹ Mainstreaming biodiversity protection in the SEA and EIA processes and decision-making is also crucially important in the regulatory framework to support ecological sustainability. The Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia also recommends that OWE projects should not be exempted from the impact assessment process¹⁶²⁰, although it fails to acknowledge the essential values of SEAs. Drawing from discussions in this thesis, particularly the review of international law and practices of selected jurisdictions in chapters four and five, the following recommendations should be considered in the EIA, SEA, and decision-making processes.

¹⁶¹⁹ Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Advisory Opinion of 1 February 2011) ITLOS Reports 2011 para 145.

¹⁶²⁰ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 392.

- Biodiversity protection should be mainstreamed in the SEA and EIA processes. Conflicts between OWE projects and protected and non-protected species should be identified. OWE projects that adversely affect the ecological integrity of biological diversity or ecologically or biologically significant areas should not be approved.¹⁶²¹ In case of doubt, as discussed in the first part of this chapter, the precautionary principle must be applied and strict conditions, which include examining other options, must be imposed. However, as discussed under the Impacts Assessment Act section in chapter three of this thesis, the Committee of the Regional Assessment of Offshore Wind Development in Nova Scotia took a less stringent approach. The Committee included sensitive areas including ecologically and biologically significant areas in the functional considerations, which may allow OWE development in these areas, although avoidance and mitigation measures are recommended by the Committee to be taken.¹⁶²²
- Biodiversity criteria based on scientific evidence should be used so that OWE activities do not compromise biodiversity objectives.
- The impacts of the development of OWE on species extinction, habitat loss or ecosystem loss, and loss of ecosystem services of social and economic value should be assessed.¹⁶²³
- The impacts of OWE projects, including the cumulative effects, on migratory species should be assessed. In addition, the location of OWE should be assessed to see

¹⁶²¹ The Conference of the Parties to the Convention on Biological Diversity, 'Marine and Coastal Biodiversity' (n 822) paras 72, 73.

¹⁶²² 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 240.

¹⁶²³ The Conference of the Parties to the Convention on Biological Diversity, 'Marine and Coastal Biodiversity: Revised Voluntary Guidelines for the Consideration of Biodiversity in Environmental Impact Assessments and Strategic Environmental Assessments in Marine and Coastal Areas' (n 1132) para 8 of the annex.

whether it is a high-risk area for migratory species, and what impacts this location might have on migratory species. The limit for OWE projects is that these projects should not undermine the distribution and abundance of migratory species and their current and future habitats in the long term.¹⁶²⁴

- The sensitivity of the environment, where OWE projects are constructed, should be assessed. Sensitive areas include protected areas, areas containing threatened ecosystems outside protected areas, areas important for the maintenance of key ecological or evolutionary processes, and habitats for threatened species.
- The size of the area affected by OWE activities, the duration and frequency of OWE activities, the magnitude of change as a result of OWE activities, the important biodiversity areas, and their legal status should be assessed.¹⁶²⁵
- The possible alternatives, which among others include location alternatives, scale alternatives, and technology alternatives should be assessed.¹⁶²⁶
- The expected biophysical changes to the components of the environment and the spatial and temporal scale of such changes with cumulative effects and effects on connectivity between ecosystems should be assessed.¹⁶²⁷

¹⁶²⁴ See Section 4.2.2 of this thesis, including The CMS Conference of the Parties, ‘Wind Turbines and Migratory Species’ (n 1167) para 1.

¹⁶²⁵ Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 Amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment and Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the Assessment of the Effects of Certain Public and Private Projects on the Environment (n 1396) Annex III.

¹⁶²⁶ The Conference of the Parties to the Convention on Biological Diversity, ‘Marine and Coastal Biodiversity: Revised Voluntary Guidelines for the Consideration of Biodiversity in Environmental Impact Assessments and Strategic Environmental Assessments in Marine and Coastal Areas’ (n 1132) para 25 of the annex.

¹⁶²⁷ *ibid.*

- The effects on the composition and processes of ecosystems, and any irreversible impacts and irreplaceable loss should be assessed.¹⁶²⁸ OWE projects that cause irreversible damage or irreplaceable loss of biodiversity should not be approved.
- Distinction and priority should be respectively made among avoidance, mitigation, and compensation measures.¹⁶²⁹
- Biodiversity-related indicators should be set to monitor the impacts of OWE projects on ecosystems so that adaptive measures can be taken to avoid unacceptable effects on ecosystems.¹⁶³⁰
- OWE projects should not undermine the conservation of wetlands and waterfowl, the related plans, established nature reserves on wetlands, and the increase in the population of waterfowl.¹⁶³¹ This can be done by identifying suitable areas for the development of OWE and avoiding areas that might have negative effects on protected areas or cause displacement or disturbance of migratory waterbirds such as migration corridors, Ramsar Sites, Special Protection Areas, and Important Bird Areas.¹⁶³²
- Areas that would have impacts on bat populations should be avoided. Bats' mortality should be reduced through using the best available technologies and measures

¹⁶²⁸ *ibid.*

¹⁶²⁹ *ibid* para 23 of the annex.

¹⁶³⁰ For example, see The CMS Conference of the Parties, 'Migratory Species Conservation in the Light of Climate Change' (n 1161) para 12; The CMS Conference of the Parties, 'Renewable Energy and Migratory Species' (n 1171) para 2(c).

¹⁶³¹ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (n 1186) arts 3.1, 4.1, 4.4.

¹⁶³² AEW Meeting of the Parties, 'Renewable Energy and Migratory Waterbirds' (n 1282) paras 1.1, 1.2, and 1.4; AEW Meeting of the Parties, 'Addressing Impacts of Renewable Energy Deployment on Migratory Waterbirds' (n 1282) para 1.1.

including blade feathering, higher turbine cut-in wind speeds, and temporary shut-down of facilities during peak periods.¹⁶³³

- The location of OWE projects must be carefully selected to be outside migration routes.
- In EIA, some criteria must be used to assess the effects of OWE projects. Such criteria include the size of OWE project, the cumulative effects of OWE projects with other projects in marine areas, the pollution or introduction of harmful substances into marine waters, the risk of accidents between OWE projects and shipping, the environmental effects on marine protected areas, environmental quality standards, the impact on landscapes of significance, the nature, magnitude, probability, duration, frequency, complexity, and reversibility of effects.¹⁶³⁴

6.4 Strengthening OWE Pollution Controls

Canada has a broad duty to protect and preserve the marine environment and has jurisdiction to pass and enforce environmental laws and regulations for the protection of the environment. This obligation includes pollution from the construction and operation of OWE installations. Pollution definition has also been strengthened to include other impacts of noise¹⁶³⁵, electromagnetic fields, and the introduction of alien or new species into the marine environment.

¹⁶³³ EUROBATS Meeting of the Parties (n 1288) paras 3 & 18.

¹⁶³⁴ Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 Amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment and Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the Assessment of the Effects of Certain Public and Private Projects on the Environment (n 1396) Annex III.

¹⁶³⁵ Scott (n 1046) 292–294; Woolley, *Renewable Energy Law* (n 1046) 197; Firestone and Jarvis (n 1046) 126; The CMS Conference of the Parties, ‘Adverse Impacts of Anthropogenic Noise on Cetaceans and Other

Various measures can be taken to avoid noise. The OWE activities, which introduce noise, should not be in the habitats of vulnerable species, concentrated areas by marine mammals, or endangered species.¹⁶³⁶ Avoidance can be done through scheduling activities based on the time when cetaceans are not present. Buffer zones around marine mammals' habitats and "safe, precautionary, and scientifically based exclusion zones" around noise sources must be established. "Noise hotspot maps" and "quiet zones" should be also developed for the identification of areas that should be avoided for the new introduction of noise.¹⁶³⁷

Several mitigation measures can be taken to reduce noise through the adoption of BEP and BAT. The measures could be in terms of the type of technology (e.g. noise reduction or suitable foundation type) with the least noise or identifying the environment with the least sensitivity to noise.¹⁶³⁸ Species and their composition that might be affected by noise should be identified and relevant mitigation measures should be adopted. National and regional noise registers and standards also help protect marine life against noise introduced during the construction and operation of OWE.¹⁶³⁹ For example, there can be a noise threshold, metrics, and measurements for noise. The impacts of noise on cetaceans, the cumulative effects of noise from other sources, and alternatives should be evaluated.

Migratory Species' (n 1046) 1. This resolution recognizes, depending on source and intensity, human-induced marine noise is a form of pollution that contains energy and that may have adverse effects on marine life.

¹⁶³⁶ ACCOBAMS Meeting of the Parties, 'Resolution 2.16 - Assessment and Impact Assessment of Man-Made Noise' (n 1253) para 1.

¹⁶³⁷ ACCOBAMS Meeting of the Parties, 'Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area' (n 1256) para 12.

¹⁶³⁸ The CMS Conference of the Parties, 'Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species' (n 1046) para 15.

¹⁶³⁹ International Whaling Commission (n 1206) para 3 (b), (c), (d) & (f).

In addition, measures should be taken to protect the marine environment from marine debris.¹⁶⁴⁰ Marine debris must be mitigated through identification and providing economic incentives, adoption of best practices for waste management, and setting quantifiable criteria for mitigation. BEP and BAT should be used, and relevant conditions should be incorporated into the contracts or permits to protect the marine environment, species, and habitats.¹⁶⁴¹

Furthermore, the Kunming-Montreal Global Biodiversity Framework's targets for 2030 include the reduction of the impacts of invasive alien species on biodiversity and ecosystem services through the prevention of their introduction by at least 50 percent.¹⁶⁴² Appropriate regulatory measures should be taken to avoid the introduction of alien species, which is the likely impact of OWE expansion.

Finally, the objective of the compensation mechanism under Canada's Oceans Protection Plan¹⁶⁴³ is to recover the marine environment from the adverse impacts of pollution. Such a compensation mechanism is limited to pollution arising from oil. While oil spill is a risk from ships providing goods and services during the construction and operation of OWE, pollution from OWE facilities such as wastes, noise, and electromagnetic fields may also adversely affect ecosystems and wildlife. There should be compensation mechanisms under the law based on the polluter pays principle so that

¹⁶⁴⁰ 'Faulty Manufacturing Blamed for Vineyard Wind Offshore Blade Failure | Reuters' <<https://www.reuters.com/business/energy/ge-vernova-says-manufacturing-issue-led-vineyard-turbine-blade-failure-2024-07-24/>> accessed 24 February 2025. The turbine blade broke and fell to the ocean on 13 July 2024 and left potentially dangerous debris on beaches on the island of Nantucket, U.S., which led to a shutdown order by authorities.

¹⁶⁴¹ Conference of the Parties to the Convention on Biological Diversity, 'Addressing Impacts of Marine Debris and Anthropogenic Underwater Noise on Marine and Coastal Biodiversity' (n 1151) paras 6 and 8.

¹⁶⁴² Conference of the Parties to the Convention on Biological Diversity, 'Kunming-Montreal Global Biodiversity Framework' (n 1127) para 11 of the Annex, targets 1, 2, 3, 6, and 8.

¹⁶⁴³ Government of Canada, 'Canada's Oceans Protection Plan' (n 859) 1.

sufficient funds are available in cases where adverse effects on ecosystems cannot be avoided or reduced. This concern has been addressed in the UK's and Germany's laws, although the details and relevant regulations are still pending.

6.5 Managing Conflicts with Shipping and Just Transition for Fishing Sector and Local Communities

In case of any potential conflict between OWE and shipping, certain rules must be followed when OWE projects are planned. These rules consider the priority of the current sea lanes, TSS, and shipping routes in the EEZ or on the continental shelf over the newly planned construction of OWE. Under the UNCLOS, Canada must consider the currently established designated sea lanes and TSS in the EEZ when it plans to develop OWE. In case of conflict, there is a possibility to amend lanes and TSS under the SOLAS regulation V/10, the IMO General Provisions on Ships' Routeing adopted by Resolution A.572(14)¹⁶⁴⁴, as amended¹⁶⁴⁵, and the rules under the COLREG.¹⁶⁴⁶ The Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia also recommends the use of Automatic Identification System (AIS) tracking introduced by SOLAS and DFO's National Vessel Monitoring System (VMS) for navigation safety and making vessel locations and movements publicly available.¹⁶⁴⁷ Canada should also ensure that the exploitation of OWE on the continental shelf and in the EEZ does not seriously obstruct sea approaches and shipping routes. In addition, the exercise of the rights of Canada to

¹⁶⁴⁴ The IMO Resolution A.572(14) on General Provisions on Ships' Routeing (n 998).

¹⁶⁴⁵ The IMO Resolution MSC.165(78) on Adoption of Amendments to the General Provisions on Ships' Routeing (Resolution A.572(14) (n 999).

¹⁶⁴⁶ The Secretariat of IMO (n 1000) 31.

¹⁶⁴⁷ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 392–393.

authorize the construction of OWE over the continental shelf ‘must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States as provided for’ in the UNCLOS.¹⁶⁴⁸

Nonetheless, Canada has the right to pass laws and regulations for the safety of OWE facilities and navigation. For instance, Canada is authorized to pass safety laws and regulations to protect the safety of navigation and OWE facilities in the territorial sea and cables laid from marine areas to land. The construction of installations and structures of OWE in the EEZ must be notified and in terms of safety as well as navigational safety, Canada must provide notification of reasonable safety zones based on international standards, which shall be no more than 500 meters, unless otherwise permitted in accordance with the “generally accepted international standards” or “recommended by the competent international organization”.¹⁶⁴⁹ Canada should also take necessary measures to ensure that ships do not enter or pass through safety zones unless specific authorization has been obtained or in case of provision of services to facilities, emergencies, or saving life or property, due coordination is made by radio contact.

Canada can also pass laws and regulations related to pollution from activities. For instance, foreign ships must follow the laws and regulations of Canada applicable to the territorial sea and “all generally accepted international regulations relating to the prevention of collisions at sea”.¹⁶⁵⁰ In addition, States must have due regard to the rights and duties of Canada in the EEZ and follow the laws and regulations of Canada such as pollution regulations. As stated earlier, the Canada Shipping Act provides for strict liability

¹⁶⁴⁸ United Nations Convention on the Law of the Sea (n 974) art 78.2.

¹⁶⁴⁹ *ibid* art 60(3),(4) & (5).

¹⁶⁵⁰ *ibid* art 21(4).

on ship owners due to damage arising from oil pollution or garbage discharges from ships. In addition, IMO has set the Revised Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life, 2023, advising on noise reduction measures.¹⁶⁵¹ The Fisheries Act is also applicable to control the introduction of deleterious substances. However, some types of pollution such as electromagnetic fields are not regulated.

In case of conflict between OWE and the fishing sector, several measures can be taken. First, fisheries-led initiatives such as fisheries liaisons established by FLOWW in the UK are effective ways for discussions and communication between the fishing industry and developers and the co-existence of these industries.¹⁶⁵² Second, OWE sites and a buffer zone around them are normally considered exclusion areas for fisheries due to reasons such as safety or lack of insurance coverage.¹⁶⁵³ Third, the impacts must be assessed to understand the loss of access to fishing grounds and the alternative locations to which commercial fisheries can have access.¹⁶⁵⁴ Dislocation of fishers may create costs (e.g. longer travels), lower fish quality and quantity of alternative grounds, and loss of income. Finally, preventive, mitigation, and compensation measures should be adopted.¹⁶⁵⁵ Appropriate site location, consultation with fishers, compensation packages to cover additional costs, and use of new technologies are among the measures that can be taken.¹⁶⁵⁶

¹⁶⁵¹ IMO (n 1344).

¹⁶⁵² ‘FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison’ (n 1502) 1.

¹⁶⁵³ Gill and others (n 450) 119, 120 & 125.

¹⁶⁵⁴ Kafas and others (n 449) 97–99.

¹⁶⁵⁵ ‘FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison’ (n 1502) 30.

¹⁶⁵⁶ Kafas and others (n 449) 100.

For compensation, it is also recommended that guidelines be developed to provide procedures for stakeholders' engagement, compensation of loss, and a unified model for industry-wide funding based on "equitable distribution of liability among OSW leaseholders".¹⁶⁵⁷

Finally, community benefit agreements have been used as a model to promote procedural, distributive, and recognitional justice. Energy justice is built upon how costs and benefits should be shared (distribution), who is affected (recognition), and what process or strategy should be used to remedy the imbalanced conditions (procedure).¹⁶⁵⁸ Distributive justice helps to identify the distribution imbalance of energy resources and how the benefits and impacts should be shared to ensure a fair outcome through a community benefit agreement.¹⁶⁵⁹ Recognitional justice requires that all members of the community are given the opportunity to represent in the process of shaping the community benefit agreement.¹⁶⁶⁰ Procedural justice also creates a participatory environment where community members are involved in establishing the design and governance of community benefits.¹⁶⁶¹

Depending on the definitional, social and regulatory context, the community benefits agreements may vary. For example, in Scotland, community benefit is a voluntary donation made by developers to support communities impacted by their projects, aiming

¹⁶⁵⁷ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 388–389.

¹⁶⁵⁸ Kirsten Jenkins and others, 'Energy Justice: A Conceptual Review' (2016) 11 *Energy Research & Social Science* 174, 175.

¹⁶⁵⁹ David Rudolph, Claire Haggett and Mhairi Aitken, 'Community Benefits from Offshore Renewables: The Relationship between Different Understandings of Impact, Community, and Benefit' (2018) 36 *Environment and Planning C: Politics and Space* 92, 93.

¹⁶⁶⁰ *ibid.*

¹⁶⁶¹ *ibid.*

to address long-term effects on local resources and the environment.¹⁶⁶² Developers are not legally required to offer such contributions and Scottish Government planning guidelines do not consider these donations as conditions for planning approval due to lack of power for enforcement in case of developers' failure to make this contribution.¹⁶⁶³ In contrast, in Massachusetts, a legally enforceable agreement between a bidder and one or more community-based organizations is made, where the bidder agrees to deliver defined community benefits, and the community-based organizations commit to supporting the project in the government approval process in specific ways.¹⁶⁶⁴ Therefore, community benefit schemes should be customized to local contexts, with clear guidance and communication between developers, local authorities, and communities to ensure meaningful and inclusive outcomes.¹⁶⁶⁵

6.6 Using OWE to Comply with Commitments under the Climate Change Regime

Canada should reduce GHG emissions, contribute to the objective of the UNFCCC, and, with other developed countries, should take the lead in combatting climate change. The development of OWE is a feasible option to fulfill this obligation. Under the Paris Agreement, Canada does not have any specific legal constraint on how to reduce GHG emissions, hence the reduction could be done through OWE, other types of renewable energy, and any other appropriate ways for reduction of GHG emissions. Nonetheless, the

¹⁶⁶² The Highland Council, 'Community Benefit' <https://www.highland.gov.uk/info/198/planning_-_long_term_and_area_policies/639/community_benefit> accessed 21 February 2025.

¹⁶⁶³ *ibid.*

¹⁶⁶⁴ BOEM, 'Massachusetts Proposed Sale Notice' (2014) <<https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/BOEM-MA-Auction-Seminar-PSN-Overview-Presentation.pdf>> accessed 21 February 2025.

¹⁶⁶⁵ Rudolph, Haggett and Aitken (n 1659) 106.

individual actions, in particular mitigation actions of Canada (like any other Party to the Paris Agreement), should be consistent with and adequate to achieve the goal of the Paris Agreement.

6.7 Federal and Provincial Legislation: Amendments and/or Regulatory

Initiatives

6.7.1 Federal Regulatory Framework

6.7.1.1 The 2024 Act

Several amendments or regulatory initiatives should be made to the 2024 Act. First, there should be clear procedures for the use of regional assessments, SEA, and EIA. Second, assessing the cumulative effects of OWE projects should be referred to in the 2024 Act and included in the regional assessments, SEA, and EIA. Such tools, with cumulative assessment, ensure that the adverse effects of OWE are assessed in combination with the adverse effects of other existing or prospective projects. For example, noise is a common adverse effect of OWE projects during construction and operation that should be assessed with other projects to ensure that the combined underwater noise does not exceed an acceptable level. Third, regulations should be adopted to prevent, avoid, and reduce the environmental impacts of OWE. There are also recommendations drawn from practices under international agreements, which were discussed in this thesis, including in this chapter. The Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia also recommends that the Canada-Nova Scotia Offshore Energy Regulator develop best practice guidelines for the OWE industry, drawing from other best practices,

guidelines, and standards of other jurisdictions.¹⁶⁶⁶ Fourth, MSP (logically after the amendment of the Oceans Act) should be referred to in the 2024 Act and be used to integrate OWE into the management of all activities in the marine environment. Finally, the Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia recommends that a position in the Canada-Nova Scotia Offshore Energy Regulator Board be reserved for a Mi'kmaq nominee, which requires the amendment of the 2024 Act.¹⁶⁶⁷

6.7.1.2 The Oceans Act

The Oceans Act should be amended and/or regulatory initiatives should be taken to include the following recommendations. First, as discussed above, the details and procedures for regulatory initiatives should be included in the Oceans Act. For instance, the draft of Canada's Ocean Noise Strategy considers research and monitoring of the individual and population-level impacts of ocean noise and evidence-based tools such as numeric criteria or acoustic thresholds.¹⁶⁶⁸ Finalizing this Strategy with the target of creating detailed regulations for noise under the Oceans Act is recommended. Similarly, MSP departmental and whole-of-government policies such as the Blue Economy Regulatory Roadmap¹⁶⁶⁹ should continue with the target to establish clear mandatory procedures for MSP under the Oceans Act. In other words, while these initiatives are primarily policy-based, they must lay a solid foundation to facilitate the development of mandatory processes for MSP under the Oceans Act.

¹⁶⁶⁶ 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 391.

¹⁶⁶⁷ *ibid.*

¹⁶⁶⁸ Fisheries and Oceans Canada, 'Canada's Ocean Noise Strategy: A Coordinated Approach to Minimize Impacts on Marine Life: Draft for Review' (n 887).

¹⁶⁶⁹ Fisheries and Oceans Canada, 'Blue Economy Regulatory Roadmap' (n 647).

Second, it is crucial that regulations ensure that marine protected areas are excluded from OWE activities. Under the Oceans Act, an area of the sea can be designated under the Oceans Act as a marine protected area for the conservation and protection of fishery resources and their habitats, endangered or threatened marine species and their habitats, unique habitats, marine areas of high biodiversity and biological productivity, and marine areas for the purpose of maintaining ecological integrity. Marine protected areas can include existing areas as well as any potential future designations in line with overarching ecological objectives. Therefore, the regulations related to marine protected areas should be updated to prohibit OWE activities in these areas. In the regulations, it should be stated that the OWE projects must not undermine the ecological objectives of protected areas.

6.7.1.3 The Fisheries Act

The Fisheries Act and relevant regulations and policies should be improved. First, the Fisheries Act only covers cases where a deleterious substance is added or released into water.¹⁶⁷⁰ This Act should include cases where activities cause the suspension of seabed sediment contaminants, which may be harmful to fish.¹⁶⁷¹

Second, the Marine Mammal Regulations¹⁶⁷², which prohibit the disturbance of marine mammals by human activities, should be amended to include a harmful incident that may occur due to the activities of OWE projects. In other words, the regulations should be clear about the conditions of permitting and consequences of cases where the

¹⁶⁷⁰ Fisheries Act (n 671) s 34(1).

¹⁶⁷¹ For reviewing this possible effect, see these two reference: *R. v. Byron Creek Collieries Ltd.* BC Provincial Court (1977) cited in Fisheries and Oceans Canada, 'Habitat Enforcement Bulletin' (n 678); Horwath and others (n 308) 27.

¹⁶⁷² Marine Mammal Regulations (n 686).

development of OWE may disturb marine mammals, including, for example, the measures that should be taken to avoid or mitigate the consequences.

Third, precaution necessitates the adoption of regulations, standards, and codes of practice to reduce discretions of authorities when reviewing and approving OWE projects. Objective-based reviewing will prevent approval of projects that cause significant loss of fish, harmful alteration, disruption, or destruction of fish habitats. Subsection 34.2(1) authorizes the Minister to ‘establish standards and codes of practice for (a) the avoidance of death to fish and harmful alteration, disruption or destruction of fish habitat; (b) the conservation and protection of fish or fish habitat; and (c) the prevention of pollution’.¹⁶⁷³ Appropriate standards should be set for all phases of OWE to protect fish and fish habitat. Subsection 34.2(2) also provides that ‘The standards and codes of practice may specify procedures, practices or standards in relation to works, undertakings, and activities during any phase of their construction, operation, modification, decommissioning or abandonment.’¹⁶⁷⁴ Adopting regulations, standards, and codes of practice should help prevent or reduce the harmful effects of OWE activities.

Fourth, the Fish and Fish Habitat Protection Policy Statement¹⁶⁷⁵ should consider the extension of its provision to regulate the impacts of OWE projects on fish and fish habitats. With this extension, the scale and type of impacts of an OWE project on the productivity of fish would be examined under this Policy Statement to determine whether OWE activities affect the lifecycle of fish, fish population, and the connection of fish and fish habitats with the components of productivity. Such an examination would inform

¹⁶⁷³ Fisheries Act (n 671) s 34.2(1).

¹⁶⁷⁴ *ibid* s 34.2(2).

¹⁶⁷⁵ Fisheries and Oceans Canada, ‘Fish and Fish Habitat Protection Policy Statement’ (n 684) 14.

whether the OWE project is harmful to ecological integrity and guide what types of measures should be taken to avoid or mitigate the impacts.

Finally, the ecosystem approach and the precautionary principle are well recognized under international law and promote ecological sustainability. The Minister of Fisheries and Oceans is allowed to consider them but not required to do so.¹⁶⁷⁶ The Act should be amended to require the application of these approaches to reduce the discretionary decisions under the Act.¹⁶⁷⁷

6.7.1.4 The Species at Risk Act

Two clear recommendations can be made regarding the Species at Risk Act, although they are general in nature and not specific to OWE. First, the listing process of species at risk, identification of critical habitats, and action plans should be made in a timely manner. To effectuate this suggestion, this Act should be amended to set specific action plan timelines and prevent delays by reducing DFO's wide discretion in listing decisions.¹⁶⁷⁸ Second, regulations or guidelines under this Act must be clear so that even when the development of OWE incidentally affects a protected species, the permit must contain terms and conditions necessary for protecting species, minimizing the impacts of OWE on species, and providing recovery plans. For instance, a condition could be if the ongoing activities of OWE threaten the survival or recovery of a species, the competent minister may revoke or amend the permit.

¹⁶⁷⁶ Fisheries Act (n 671) s 2.5.

¹⁶⁷⁷ David L VanderZwaag and others, 'Canada and Ocean Climate Adaptation: Tracking Law and Policy Responses, Charting Future Directions' (2023) 10 *Frontiers in Marine Science* 1168573, 12; IUCN Council (n 279) Introduction and Guideline 1.

¹⁶⁷⁸ VanderZwaag and Engler-Palma (n 697) 14; Koubrak, VanderZwaag and Worm (n 706) 3.

6.7.1.5 Migratory Birds Convention Act

The Migratory Birds Convention Act should clearly outline the regulatory framework governing the impacts of offshore wind farms on migratory birds. A relevant question is what protections should be in place in addition to the prohibition of pollution from vessels and other sources, which is the central concern of the Act. The Act provides an opportunity for the Governor in Council to make regulations for the purpose of this Act. The Migratory Bird Sanctuary Regulations identify migratory bird sanctuaries and prohibit activities ‘harmful to migratory birds or the eggs, nests, or habitat of migratory birds, except under the authority of a permit’.¹⁶⁷⁹ However, the Regulations should be reviewed, and revised to ensure that the potential OWE sites do not overlap migratory birds’ routes and nests. It is imperative to ascertain whether these sanctuaries cover the protection of all migratory birds, their entire migratory routes, and nesting sites. Furthermore, it is essential to delineate the extent of protection and the corresponding regulations in the event of permitting the OWE project that may result in a collision, disturbance, or displacement of birds. For example, under the Birds Directive of the EU, prohibition can be derogated based on a permit under “strictly supervised conditions” and “in small numbers”.¹⁶⁸⁰ Such derogation must also specify the species, the impacts on the species, and the conditions and monitoring measures under which a project is granted.

In any case, in the event of any adverse effects from OWE projects on migratory birds, it is also crucial to make regulations for monitoring and mitigation measures and assessment of the cumulative effects and impacts on the population level of birds.

¹⁶⁷⁹ Migratory Bird Sanctuary Regulations (n 758) s 10(1).

¹⁶⁸⁰ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds (n 1385) art 9(1)(c).

Regulations are indispensable to prevent, monitor, and mitigate the risks to migratory birds posed in various stages of OWE projects, including construction and operation.

6.7.1.6 Canadian Environmental Protection Act

The Canadian Environmental Protection Act provides wide coverage for regulating pollution from different activities, including OWE. Other Acts such as the Fisheries Act and the 2024 Act have prohibited the discharge of substances into water. The Canadian Environmental Protection Act, however, provides a better route with more jurisdictional coverage and a less fragmented approach. For instance, regulations can be set under the general obligations of this Act, requiring “nationally consistent standards of environmental quality”, protection of “the environment.... from the risk of any adverse effects of the use and release of ...pollutants and wastes”, “guidelines recommending environmental limits” for the quantity of release of substances, “codes of practice respecting pollution prevention” to control activities during various phases of OWE projects such as construction and operation.¹⁶⁸¹

This thesis recommends that general issues such as cutting and waste of materials, noise during the construction and operation phases of OWE, and electromagnetic fields are regulated under the Canadian Environmental Protection Act by determining an acceptable level of pollution from OWE.

6.7.1.7 Canadian Energy Regulator Act

The Canadian Energy Regulator Act and the Canada Offshore Renewable Energy Regulations proposed in February 2024¹⁶⁸² lack environmental regulations and standards,

¹⁶⁸¹ Canadian Environmental Protection Act (n 764) s 2(1)(g), s 2(1)(j).

¹⁶⁸² Government of Canada, ‘Canada Gazette, Part 1, Volume 158, Number 8’ (n 848).

compliance mechanisms for operators, and adequate liability mechanisms. This Act and regulations only contain liability for loss, damage, costs or expenses related to debris” and do not cover compensation mechanisms for any other environmental loss or damage. Adequate liability mechanisms should be established in the Act or Regulations to cover compensation mechanisms for any other environmental loss or damage. Such mechanisms highly depend on improving other laws and regulations because so long as laws and regulations do not require meeting a specific acceptable standard related to various environmental effects of OWE such as noise, electromagnetic fields, and loss of fish, birds, and bats, how can the regulatory framework make operators liable?

6.7.1.8 Additional Regulatory Support for Birds and Bats

Considering significant concerns over the conservation of birds and bats arising from the likely negative impacts of OWE, additional regulatory support is needed. Migratory Bird Sanctuaries are identified under the Migratory Birds Convention Act. Bat species, including Tri-colored Bats, the Little Brown Myotis, and the Northern Myotis, are listed as endangered species under the Species at Risk Act.¹⁶⁸³ However, due to their limited applications, these two Acts do not provide full coverage for the protection of birds and bats. In other words, the status of birds and bats, whether they are migratory or whether they are at risk, should not be considered for receiving protection. For instance, The EU Birds Directive covers the conservation, protection, management, and control of “all

¹⁶⁸³ Species at Risk Act (n 694) sch 1.

species of naturally occurring birds in the wild state” in Europe and the territory of Member States.¹⁶⁸⁴ A specific Act such as the Bat Protection Act can be suggested as well.¹⁶⁸⁵

6.7.2 Provincial Regulatory Framework

6.7.2.1 Nova Scotia Environment Act

Two sets of amendments should be considered with respect to the Environment Act. Firstly, the Environmental Assessment Regulations, 1995,¹⁶⁸⁶ under the Nova Scotia Environment Act should be revised to classify the type of required environmental assessment. The criterion for classification can be the size of the project (the output of the project per megawatts) or the number of turbines that will be used to produce energy. Such classification affects the stringency of the process for impact assessment.

Secondly, the Activities Designation Regulations¹⁶⁸⁷ could be amended to consider OWE as a designated activity that requires approval (e.g. type A) under this regulation. Such designation requires that the project shall not commence unless the proponent holds an appropriate class of approval under Section 50 of the Act and this regulation. In this case, Section 50 would require that if the OWE project is not in the public interest, contravenes a governmental policy, or has an unacceptable location or adverse effects, the Minister has the discretion not to issue an approval.

¹⁶⁸⁴ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds (n 1385) art 1.

¹⁶⁸⁵ Meredith Blaydes Lilley and Jeremy Firestone, ‘Wind Power, Wildlife, and the Migratory Bird Treaty Act: A Way Forward’ [2008] Environmental Law 148.

¹⁶⁸⁶ Environmental Assessment Regulations (n 927).

¹⁶⁸⁷ Activities Designation Regulations (n 934).

6.7.2.2 Marine Renewable-energy Act

The Act¹⁶⁸⁸ has not designated a priority area for OWE but offers a possibility that such an area is established. Establishing such an area is subject to SEA, public consultation, and examining any existing rights or interests over property, permits, and licenses. However, according to the findings of this thesis, it is more appropriate that developments, including OWE, in provincial waters fall within broader provincial-federal management plans. This was not the case in the previous MSP initiatives on the West Coast. The lack of federal involvement in the Marine Plan Partnership in British Columbia excluded management issues related to fisheries and marine transportation.¹⁶⁸⁹ However, DFO has recently published the “Marine Spatial Planning Framework for the Southern B.C. Planning Area” which involved the Province of British Columbia, First Nations, Indigenous organizations and stakeholders to create a framework for future stages of MSP.¹⁶⁹⁰ Likewise, a high-level MSP initiative has recently been published for Scotian Shelf and Bay of Fundy.¹⁶⁹¹

6.8 Remaining Questions

The broader implications of theories are areas that need research. Rights of Nature, Earth trusteeship, and ecological sustainability all require rethinking property rights and rights to own and exploit natural resources. This line of thinking has significant implications for justice, law, and political structures. The inherent conflict between ownership rights and the conflict with the normative content of protecting the environment

¹⁶⁸⁸ Marine Renewable-Energy Act (n 939).

¹⁶⁸⁹ Short and others (n 147) 11.

¹⁶⁹⁰ Fisheries and Oceans Canada, ‘Southern B.C. Marine Spatial Planning Framework’ (n 153).

¹⁶⁹¹ ‘Maritimes Region First-Generation Marine Spatial Plan: Scotian Shelf and Bay of Fundy’ (n 643).

and ecosystems signifies a new approach to formulating the relationship with the environment. This conflict, which has been the subject of numerous decisions of the Supreme Court of Canada, urges us to think about how the Constitution Act 1867 should be amended to offer power to the environment. The effect of this rethought legal system on the energy sector and its transition to new technologies such as OWE would be an interesting area for research.

Further questions that come to mind include: How should international law respond to the competing economic interest of developing OWE, achieving climate change targets, and advancing ecological/biodiversity goals? How might OWE be best addressed in a transboundary context where development pressures are advancing in neighboring jurisdictions? What are the social perceptions in Nova Scotia about OWE and how law can respond to those perceptions? How should legal procedures enable socio-economic structures to advance MSP under the Oceans Act? How should the law reconcile any potential conflicts between Indigenous people's rights, the development of OWE, and ecological objectives? How should laws and regulations respond to other requirements related to the safety of OWE in-field personnel, the abandonment and decommissioning of OWE structures, and coexistence between OWE and other sectors (e.g. commercial fisheries) or a compensation regime for fisheries?¹⁶⁹²

In conclusion, the fast-moving federal-provincial blades of the economy for the development of OWE should be equipped with an ecologically sustainable regulatory engine. This thesis demonstrates that current Canadian laws and policies governing OWE are insufficient to ensure an ecologically sustainable future. Achieving climate objectives

¹⁶⁹² 'Regional Assessment of Offshore Wind Development in Nova Scotia: Final Report' (n 806) 383–384.

through OWE must not come at the expense of ecological integrity and biodiversity. Drawing on ecological sustainability, guidance from international law, and lessons from selected jurisdictions, this thesis proposes a more integrated and holistic regulatory framework for OWE in Canada. A clear legal commitment to ecological sustainability must serve as the foundation of Canada's OWE governance to avoid the adverse effects of OWE development on marine ecosystems. The framework must also unequivocally incorporate the ecosystem approach, adaptive management, and the precautionary principle, and be firmly anchored in tools such as MSP, SEA, and EIA. The experiences of the UK, Denmark, and Germany underscore the importance of centralizing regulation to simplify permitting processes while safeguarding ecological integrity. In sum, informed by these lessons, this thesis provides a roadmap for reform, ensuring that Canada can develop OWE in a way that aligns with both its climate goals and its responsibility to preserve ecological integrity for future generations.

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