Prevailing Winds: Regulatory Frameworks and Commercial Realities for Developing Wind and Green Hydrogen Projects in Nova Scotia and Newfoundland and Labrador

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Table of Contents

1. INTRODUCTION

In recent years, there has been ever-growing enthusiasm on the part of both governments and industry for the development of onshore wind, offshore wind, and associated development of green hydrogen resources in Atlantic Canada. This is not surprising, given that many tout the proliferation of a hydrogen industry as a new frontier in energy development in Canada. A 2021 study prepared for the Offshore Energy Research Association estimates that if exports from Atlantic Canada were able to address just 5 % of the total European demand for hydrogen, it could generate $9 billion annually.[1] Current annual revenues from the oil and gas sector were approximately $8.2 billion in 2019.[2]

The potential of new wind-related energy development has attracted world leaders to the region, with a visit to Newfoundland and Labrador ("NL") by Prime Minister Trudeau and German Chancellor Scholz in 2022. In February, 2023, the Belgian Ambassador to Canada led a delegation to Halifax for discussions surrounding green hydrogen partnerships, including exports from Nova Scotia ("NS").[3] In NS, the provincial government has set a target of 5 gigawatts of energy to be supplied by offshore wind by 2030 and has amended a number of laws to support green hydrogen development.[4] In NL, the provincial government has removed a statutory onshore wind

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1 Zen and the Art of Clean Energy Solutions et al, *A Feasibility Study of Hydrogen Production, Storage, Distribution and Use in Newfoundland and Labrador* (Offshore Energy Research Association, 2021) online: <https://oera.ca/sites/default/files/2021-07/a-feasibility-study-of-hydrogen-production-storage-distribution-and-use-in-the-maritimes-nl.pdf>, at vi [OREA 2021].

2 *Ibid.*

3 Jesse Thomas, "Belgium looks to Nova Scotia to help deliver green hydrogen to Europe", *CTV NEWS Atlantic*, (9 February 2023), online: <https://atlantic.ctvnews.ca/mobile/belgium-looks-to-nova-scotia-to-help-deliver-green-hydrogen-to-europe-1.6267683?cache=rbyihszjzxf >.

4 Nova Scotia Department of Natural Resources and Renewables, News Release, "Province Sets Offshore Wind Target" (20 September 2022), online: <https://novascotia.ca/news/release/?id=20220920003>.

development restriction which has revitalized industry interest in the region.[5] The federal government in partnership with NS and NL, has begun environmental impact assessments of certain NS and NL offshore areas in anticipation of offshore wind development.[6] Additionally, the federal government, NS and NL have begun the process of reforming the joint federal-provincial offshore petroleum boards to provide for broader mandates to act as regulators for offshore wind development.[7]

Announcements and commentary from provincial and federal leaders point to imminent development of onshore, offshore and green hydrogen resources. Further, the decision to amend the mandate of existing offshore petroleum boards to regulate new wind-related development reflects governments' desires to rapidly develop new regulatory regimes to facilitate these industries. Focusing on NS and NL, this paper will examine existing and proposed regulatory frameworks associated with wind-related development, highlighting legislative, regulatory and commercial realities faced by lawmakers and industry in the rapidly shifting and competitive offshore and green hydrogen space.

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5 Newfoundland and Labrador Department of Industry, Energy and Technology, News Release, "Ministerial Statement – "Minister Parsons Announces End of Moratorium on Wind Development" (5 April 2022), online: <https://www.gov.nl.ca/releases/2022/iet/0405n07/> [NL News Release].

6 Impact Assessment Agency of Canada, New Release, "Governments of Canada and Newfoundland and Labrador launch regional assessment to support future decisions on offshore wind projects in the province" (23 March 2023), online: <https://www.canada.ca/en/impact-assessment-agency/news/2023/03/governments-of-canada-and-newfoundland-and-labrador-launch-regional-assessment-to-support-future-decisions-on-offshore-wind-projects-in-the-province.html>; Impact Assessment Agency of Canada, New Release, "Governments of Canada and Nova Scotia launch regional assessment to support future decisions on offshore wind projects in the province" (23 March 2023), online: <https://www.canada.ca/en/impact-assessment-agency/news/2023/03/governments-of-canada-and-nova-scotia-launch-regional-assessment-to-support-future-decisions-on-offshore-wind-projects-in-the-province.html>.

7 Impact Assessment Agency of Canada, New Release, "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" (11 April 2022), online: <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>.

This paper will also examine possible disconnects and gaps between the commercial realities of wind-related development and both existing and proposed regulatory regimes in comparison with select international offshore regimes.

In its first section, this paper will provide a high-level overview of energy generation and consumption in NS and NL. This section will examine specific legislative and regulatory instruments adopted in each province to promote renewable energy targets and associated development of new renewable energy sources. This overview will highlight the underlying motivations, opportunities and challenges for NS and NL in the pursuit of onshore and offshore wind and green hydrogen development.

The second section of the paper will review the experience of both NS and NL to date with onshore wind turbine deployment in order to examine its role in meeting renewable energy targets and providing renewable electricity for proposed green hydrogen developments. It will be shown that new large-scale onshore wind installations, which are expected to be completed before offshore installations, will be critical for supplying proposed green hydrogen facilities. Provincial and federal government initiatives to promote the development of offshore wind and green hydrogen will be examined. The regulatory regime for the burgeoning wind and hydrogen industries in NS and NL will be compared to the more mature regimes of select European countries and the European Union ("EU"), highlighting key similarities and differences against the NS and NL context. Drawing upon the preceding sections, this paper will review significant challenges that could be faced by NL and NS as each try to rapidly pursue wind and green hydrogen development.

2. ENERGY PRODUCTION AND REGULATION IN NS AND NL

Newfoundland and Labrador

Without context, the resistance of NL to exploit its world-leading wind resource is baffling. The main reasons for the province's hesitance to tap into this resource are its historical lack of reliability from a capacity perspective (i.e. it is an intermittent resource) for domestic use and that it never made sense from an export perspective. The proliferation of a wind to hydrogen industry is a game-changer, but understanding the province's energy mix is critical to understanding the challenges that lay ahead.

NL prioritized a combination of hydroelectric and oil-fired generation sources in order to service its domestic customers for decades. Wholesale domestic supply of energy is provided through a crown corporation, Newfoundland and Labrador Hydro ("NL Hydro"). Energy generation was intended to come from 98% renewable sources by now with the recent development of the Muskrat Falls Project, an 824 MW hydroelectric generating facility with new multi-billion-dollar transmission system.[8]

There has been export of energy produced at Upper Churchill Falls secondary to a power contract dated 1969 between Hydro Quebec and a subsidiary of NL Hydro, Churchill Falls (Labrador) Corporation Limited. Upper Churchill Falls is one of the largest hydroelectric production facilities in the world with installed capacity of 5,428 MW. Save for a 300 MW recall

[8] First power at the Decision Gate 3 stage was expected to be achieved by July 2017. The project considered to be "commissioned" on April 14, 2023 after critical testing of transmission infrastructure. The project was expected to cost $6.2 billion, but will cost at least $13 billion. Delays in construction on the Muskrat Falls Project and its related transmission system, along with reliability concerns for the transmission system, has delayed the out-service of the Holyrood Generating Facility, which is the NL's major oil-fired generator.

block and 225 TwinCo block, virtually all of this power has been exported to Quebec at low rates which the contract provides will continue until 2041.[9]

Wind energy generation has never seriously been a priority for domestic use.[10] Notwithstanding the potential synergies of wind and hydro resources (if the wind does not blow, NL Hydro can simply manipulate the flow of water reservoirs behind hydro dams), NL's energy plan actually precluded the development of wind resources on the island of Newfoundland under the *Electrical Power Control Act.* This was meant to eliminate any potential competition for Muskrat Falls as the domestic source of electricity in the province, thereby guaranteeing the revenue to NL Hydro necessary to support financing for the Muskrat Falls project. Until now, with the potential proliferation of a wind to hydrogen industry opening up new export markets, wind energy generation has not been a large factor in the energy mix.[11]

Nova Scotia

Unlike NL, NS does not have significant domestic hydroelectricity generation as a source of renewable energy. NS has remained heavily reliant on burning coal and other fossil fuels for its energy needs throughout its history. Fuel oil was the predominant resource used for energy generation until the 1970s OPEC crisis, when a transition was made to locally mined coal.[12] Since

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9 The Upper Churchill Falls Project and associated contract with Hydro-Quebec has long been a sore point for NL, culminating in what is colloquially referred to as the "good faith case" wherein the Supreme Court of Canada concluded that Hydro Quebec's large windfall in relation to the project was "honestly earned". See *Churchill Falls (Labrador) Corp v. Hydro Quebec,* 2018 SCC 46 at 107.

10 Some wind generation was considered as part of the isolated island option in comparison to the Muskrat Falls option.

11 There are exceptions. There are 27 MW wind farms in Fermeuse and St. Lawrence, NL. There was also the development of wind turbines in Ramea, NL.

12 Nova Scotia Power, "How We Make Electricity" (2023), online: <https://www.nspower.ca/about-us/producing>.

1999, coal has been procured from international markets following the closure of coal mining operations in Cape Breton.[13]

In 2007, the provincial government passed the ambitious, *Environmental Goals and Sustainable Prosperity Act* (the "*EGSPA*").[14] This legislation was premised upon the belief that NS "…was well positioned to prosper by embracing the "environmental economy," evidenced by its earlier success in waste management, the growing importance to its business sector of environmental sustainability, and the perceived strengths of its higher education sector in fields of study related to the environmental economy."[15] The *EGSPA* set out a number of long term objectives relating to emissions and electricity generation with specific targets for the reduction of nitrogen, mercury and sulphur dioxide emissions and for an overall reduction of greenhouse gas emissions by 10 % below 1990 levels.[16] The *EGSPA* also set the target of 18.5% of the electricity needs of NS being obtained from renewable sources.[17]

The *EGSPA* was amended in 2012 to identify climate change adaptation as a specific goal and to update targets for electricity generated by renewable energy sources as follows:

> *(i) 18.5 per cent is obtained from renewable energy sources by 2013,*
>
> *(ii) 25 per cent is obtained from renewable energy sources by 2015, and*
>
> *(iii) 40 per cent is obtained from renewable energy sources by 2020.* [18]

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13 *Ibid.*

14 *Environmental Goals and Sustainable Prosperity Act,* SNS 2007, c. 7. [EGSPA].

15 William Lahey and Meinhard Doelle (2012) "Negotiating the Interface of Environmental and Economic Governance: Nova Scotia's Environmental Goals and Sustainable Prosperity Act", 35:1 Dalhousie LJ at 3. [Lahey and Doelle]

16 EGSPA, *supra* note 14 at s. 4(2).

17 *Ibid.*

18 ESGA, *supra* note 14, as amended by *Green Economy Act,* SNS 2012, c 42, at s. 4(2)(b)

The *EGSPA* is a somewhat unique environmental and policy instrument as noted by Lahey and Doelle:

> *[…] EGSPA is different from typical green plans because it is law. That said, EGSPA does not do what environmental law typically does: it does not regulate, or create authority to regulate, non-governmental actors. At most, it sets the stage for regulation necessary for the achievement of its goals, primarily, but not exclusively under Nova Scotia's Environment Act.*[19]

The *Renewable Electricity Regulations* made under Section 5 of the *Electricity Act* SNS 2004, c. 25 (the "RER"), were first introduced in 2010 as a regulatory mechanism to regulate energy generation by "load serving entities" including Nova Scotia Power Incorporated ("NSPI").[20] The RER mandated that NSPI was to supply its customers with renewable electricity in an amount equal to or greater than 40 % of the total amount of electricity supplied to its customers by 2020.[21] NSPI was to meet the 2020 renewable energy target by:

> *"[…] directly or indirectly acquiring, to deliver to customers in the Province, 20% of the electricity generated by the Muskrat Falls Generating Station if the Muskrat Falls Generating Station and associated transmission infrastructure is completed and in normal operation and the UARB [Nova Scotia Utilities and Review Board] has approved an assessment against NSPI under the Maritime Link Act and its regulations.*[22]

The Maritime Link is a major infrastructure project undertaken by NSP Maritime Link Inc., a wholly-owned subsidiary of Emera Newfoundland & Labrador Holdings Inc. and an affiliate of NSPI. Linking Labrador to NS via the island of Newfoundland, the project consists of both over-land transmission lines and a 170-kilometre subsea transmission line to deliver electricity

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19 Lahey and Doelle, *supra* note 15, at p. 8.

20 NS Reg 155/2010 at ss 6A (1), 6A (2) [RER].

21 RER, *supra* note 20, at 6A (2).

22 RER, *supra* note 20, at 6A(2)(c).

generated by the Muskrat Falls to NS.[23] The Maritime Link is set to deliver 900 GWh of electricity per year to NS. The project will also make additional electricity available for purchase. The NS government estimates that the Maritime Link will supply between 8 and 20 % of the Province's electricity needs based on the delivery of 900 GWh and additional purchased electricity.[24] The Maritime Link was completed in 2018, however delays in the delivery of electricity from Muskrat Falls contributed to Nova Scotia missing the target of having 40% of electricity supplied by renewable sources by 2020.[25]

Pursuant to the RER, renewable electricity must account for 80 % of total electricity delivered to customers by "load serving entities," including NSPI from 2030 onward. [26] The RER sets parameters for how NSPI is to meet renewable electricity targets by mandating NSPI to acquire renewable electricity from different sources. Notably, in connection with the 2030 target described above, NSPI must:

1. Continue to supply at least 5% of its total annual sales from independent power producers;
2. Acquire at least 1100 GWh from independent power producers; and
3. Directly or indirectly acquire, to deliver to customers in the Province, 20% of the electricity generated by the Muskrat Falls Generating Station if the Muskrat Falls

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23 Emera Newfoundland & Labrador, "Project Overview: Maritime Link" (2023), online: <https://www.emeranl.com/maritime-link/overview>.

24 Nova Scotia Department of Natural Resources and Renewables, " Maritime Link/ Lower Churchill Hydroelectric Project" (2014), online: < https://energy.novascotia.ca/renewables/programs-and-projects/maritime-linklower-churchill>.

25 Gianina Giacosa and Tony Walker, "A policy perspective on Nova Scotia's plans to reduce dependency on fossil fuels for electricity generation and improve air quality" (2022) 3 *Cleaner Production Letters*, online: <https://www.sciencedirect.com/science/article/pii/S266679162200015X> at 7; Also note that the "Atlantic Loop" has been touted as a means to bring more renewable energy to NS from Labrador and Quebec by upgrading the transmission lines through Labrador, Quebec, New Brunswick and Nova Scotia. While the project is intended to be complete by 2030, Premier Tim Houston of Nova Scotia has recently voiced skepticism regarding the feasibility of the project.

26 RER, *supra* note 20, at s 6B (1).

> Generating Station and associated transmission infrastructure is completed and in normal operation.[27]

Additionally, in order to meet the 80% target, the RER provides that NSPI may acquire renewable electricity from other sources outside of the Province.[28]

3. WIND-RELATED ENERGY IN NOVA SCOTIA AND NEWFOUNDLAND AND LABRADOR

Onshore Wind in NS

As of 2019, 11% electricity generation in NS came from onshore wind turbines.[29] According to NSPI, there are currently 300 commercial wind turbines operational in NS.[30] Most of the onshore wind turbines currently operating in NS are owned by independent commercial power producers, while NSPI owns and operates facilities on Nuttby Mountain and Digby Neck, and has a minority stake in several projects.[31] Most commercial wind installations in NS are small in scale with less than 3 turbines; however there have been a number of larger scale projects that have come online in the last fifteen years including:[32]

Project Name	**Number of Turbines**	**Capacity**
Dalhousie Mountain	34	51 MW
Glen Dhu	27	62.1 MW

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27 RER, *supra* note 20, at ss 6B (2), 6B (3).

28 RER, *supra* note 20, at ss 6B (2), 6B (3); Additionally, following the passage of the *Electricity Efficiency & Conversation Restructuring (2014) Act*, SNS 2014, c.5, Demand Side Management programs were implemented. These programs are funded by rates collected by NSPI to reduce and shape electricity usage in a manner which would reduce electrical generation from high carbon generation facilities.

29 Canada Energy Regulatory, " Provincial and Territorial Energy Profiles – Nova Scotia" (2023), online: <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-nova-scotia.html> [CER-NS].

30 Nova Scotia Power, "Clean Energy Sources" (2023), online: <https://www.nspower.ca/cleanandgreen/clean-energy/clean-energy-sources>.

31 *Ibid.*

32 *Ibid.*

Sable	6	13.8 MW
South Canoe	34	102 MW

In February 2022, through its independent procurement administrator, CustomerFirst Renewables, the NS government issued a request for proposals for wind and solar energy projects that would supply 350 megawatts of electricity or 10 % of the Province's electricity.[33] This represents the largest procurement of renewable energy ever in NS. In August 2022, five contracts were awarded in response to the February request for proposals. Each project is set to be complete in 2025 and are to be majority owned by Mi'kmaw communities. The new projects are summarized below:

Developers	**Project Name**	**Location**
Natural Forces Development and Wskijnu'k Mtmo'taqnuow Agency Ltd.	Benjamin Mills Wind	Hants County
Potentia Renewables and Annapolis Valley First Nation.	Ellershouse 3 Wind	Hants County
Elemental Energy and Sipekne'katik First Nation	Higgins Mountain Wind Farm	Colchester and Cumberland Counties
SWEB Development and Glooscap First Nation.	WEB Weavers Mountain	Pictou and Antigonish Counties
Elemental Energy and Sipekne'katik First Nation	Wedgeport Wind Farm	Yarmouth County

33 Nova Scotia Department of Natural Resources and Renewables, News Release, "Province's Largest Procurement for Renewable Energy Moves Forward" (11 February 2022), online: <https://novascotia.ca/news/release/?id=20220211004>.

The five projects listed above, have a nameplate generating capacity of 372 MW and are projected to produce 1,373 GW hours per year of electricity, representing approximately 12 % of Nova Scotia's total annual energy consumption.[34] This exceeds the figures provided for in the initial request for proposals. Accordingly, each of the five new projects will be among the largest ever constructed in the Province.

All onshore wind projects with a production rating of at least 2 MW must obtain a Class I Environmental Assessment Approval under the *Environmental Assessment Regulations* made under Section 49 of the of the *Environment Act*.[35] A guide issued by the Environmental Assessment Branch of the Department of Environment and Climate Change, notes the following regarding the distinctions between Class 1 and Class 2 undertakings:

> *Class 1 undertakings are usually smaller in scale and may or may not cause significant environmental impacts or be of sufficient concern to the public. A public review of a proponent's initial submission, called a registration document, is required, after which the Minister will decide if a more detailed review and/or public hearing is required. Examples of these types of developments include mines, certain highways and waste dangerous goods handling facilities.*
>
> *Class 2 undertakings are typically larger in scale and are considered to have the potential to cause significant environmental impacts and concern to the public. These undertakings require an EA report and formal public review which may include public hearings. Examples of these types of developments include solid waste incinerators, petrochemical facilities and pulp plants.*[36]
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> [Emphasis Added]

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[34] Simon Smith, "NS Selects five wind projects to produce electricity from renewable sources" *CBC NEWS* (17 August 2022), online: <https://www.cbc.ca/news/canada/nova-scotia/n-s-selects-five-projects-largest-ever-wind-procurement-1.6553677>.

[35] NS Reg 16/1995 [EAR].

[36] Nova Scotia Environment, *A Proponent's Guide to Environmental Assessment* (2017), online: <https://novascotia.ca/nse/ea/docs/EA.Guide-Proponents.pdf)> at 7.

The lower level of regulation and public consultation associated with Class I approvals may be attractive to potential developers but could lead to public opposition in of the light of the unprecedented large-scale onshore wind projects being contemplated in connection with future green hydrogen developments in the Canso Strait and Guysborough Areas.

Onshore Wind in NL

On April 5, 2022, the Government of NL announced the "end of the moratorium on wind development".[37] The legal instrument underpinning the moratorium is found at section 14.1(2) of the *Electrical Power Control Act* ("EPCA"), which states no one may "develop, own, operate, manage or control a facility for the generation and supply of electrical power or energy either for its own use or for supply directly or indirectly to or for the public or an entity on the island portion of the province". As stated above, the policy rationale for this was to guarantee NL Hydro's monopoly on domestic supply of energy in the province.

There are exceptions to this general rule: subsection 14.1(7) of the EPCA allows the province to exempt a retailer or industrial customer from the 14.1(2) prohibition. Short of legislative change, wind-to-hydrogen proponents will need a 14.1(7) exemption. To date, there has yet to be any clear policy framework through which government may provide these exemptions.

In addition to the EPCA barriers, a 2006 Order in Council ("2006 OC") outright banned the issuance of Crown leases or grants for commercial wind generation projects that proposed to produce energy for sale.[38] The Government of NL amended the 2006 OC on April 5, 2022, to "allow industrial customers seeking to self-generate wind energy for their own consumption, and

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37 NL News Release, *supra* note 5.

38 OIC 2006-026, online: <https://www.exec-oic.gov.nl.ca/public/oic/details?order-id=11623>.

industrial customers or retailers seeking to generate wind energy for export, to apply for Crown leases or grants, under the authority of the Lands Act, and Environmental Assessments, under the authority of the Environmental Protection Act". By this point, the EPCA barrier remained but government had opened the window to obtaining Crown land and beginning the environmental assessment process. While the amendment to the 2006 OC was a welcome sign for industry, it would not be until the provincial government finalized its policy framework in respect of Crown land acquisition that proponents could begin to secure land.[39]

That policy announcement came on July 27, 2022 with the release of the Government of NL's "Guidelines: Nominating Crown Lands for Wind Energy Projects" (the "Guidelines").[40] The Guidelines touted NL's renewable energy resources as abundant, with opportunities to develop green hydrogen and ammonia resources in addition to wind generation. Most striking in the Guidelines was the pace at which the government intended to move: a "land nomination" process was to begin immediately, moving in phases to an eventual bidding process.

Phase 1, titled "Calls for Land Nominations", began immediately with a deadline of October 1, 2022. During this phase, proponents were asked to provide nominations for areas they wished to develop for wind energy projects. Once proponents "nominated" lands, then the Government of NL would proceed to identify the lands that they would put up for bidding.

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[39] In Newfoundland and Labrador, most of the prime land to be exploited for wind generation assets is held by the Crown.

[40] Newfoundland Labrador Department of Industry, Energy and Technology, *Guidelines: Nominating Crown Lands for Wind Energy Projects* (26 July 2022), online: <https://www.gov.nl.ca/iet/files/Guidelines-Nominating-Crown-Lands-for-Wind-Energy-Projects.pdf>.

Phase 2, the "Call for Land Bids", was designed to be a competitive process. The Government of NL announced the specifics of this process along with the lands available for bidding on December 14, 2022. The deadline for competitive bids was March 23, 2023. By this point, it was abundantly clear that lands were not going to be granted or leased on a first-come-first-serve or even highest-bidder basis; instead, the process had the trappings of a procurement process in which bidders were to be evaluated on the following factors:

1. Project summary;
2. Associated Hydrogen/Ammonia production;
3. Water requirements;
4. Project risk mitigation;
5. Electricity considerations and grid impacts;
6. Community and Indigenous Engagement;
7. Project schedule; and,
8. Financing

This "First Stage Review" evaluated whether submissions met a minimum threshold expected of a bidder to be able to deliver a wind energy project. Those successful in the Phase 1 review will automatically proceed to a "Phase 2 Review". This is expected to occur in the second or third quarter of 2023, at the earliest. Rather than a threshold review, the Phase 2 review is more robust with a weighted evaluation system as follows:

1. Bidder: 15%
2. Project Risk Mitigation: 5%
3. Electricity Considerations and Grid: 15%
4. Community and Indigenous Engagement: 10%

5. Benefits: 15%

6. Project Schedule: 10%

7. Financing: 10%

Once through this process, successful bidders are not awarded Crown land at the outset. Instead, the Government of NL utilized existing mechanisms under the *Lands Act* to reserve certain lands for which successful proponents would have the exclusive right to formally apply. After that, the Government of NL will provide successful proponents a "wind application recommendation letter" from the Department of Industry, Energy and Technology. This is intended to serve as the legal instrument that guarantees a proponent an exclusive opportunity to secure relevant Crown land, subject to the various legislation including the *Public Utilities Act,* the *Electrical Power Control Act, 1994,* and the *Environmental Protection Act.*

In an attempt to assist proponents to model their projects before submitting its Phase 1 submission, on February 23, 2023, the Government of NL announced its fiscal framework for wind to hydrogen projects in the province. Predictability and transparency were the intended principles for the framework, while also attempting to balance the risk of investment with the use of provincial resources.

For a singular project over a 30-year period, the Government of NL projected a total of $3.5 billion in taxes, royalties and fees.[41] The payments are broken down into three components: land, wind and water:

[41] Using a base case of a 1000 MW Windfarm and a 500 MW Hydrogen (Ammonia) Facility with capital costs of $3.5 billion with an annual production of 60k tonnes of hydrogen converted to 344k tonnes of ammonia.

Land

Crown Land Reserve Fee: Annual charge of 3.5% of the market value of reserved lands. Payments begin upon award of exclusive right to pursue projects on lands.

Crown Land Lease Fee: Annual charge of 7% of market value of land. Payments begin upon issuance of Crown Land lease.

Wind

Wind Electricity Tax: Annual charge of $4,000 per megawatt on installed capacity. Payments begin when the turbines are "in-service", and applicable to all wind-hydrogen projects (≥ 5 megawatts) producing electricity for the purposes of producing hydrogen.

Water

Water Use Fee: Annual charge of $500 per 1000$m^3$ of water licensed and used, and $50 per 1000$m^3$ of water licensed but not used. Payments begin when permit is issued, and are applicable to all hydrogen facilities.

Water Royalty: Payable based on the calculated residual value of the water. Rates are tiered and linked to cost recovery. These terms can be modified via agreements with the Province. …

- Tier 1: Rate of 10% applied after 1x cost recovery.
- Tier 2: Rate of 20% applied after 2x cost recovery.
- Tier 3: Rate of 25% applied after 3x cost recovery.

Offshore Wind in NS and NL

With thousands of kilometers of coastline, powerful offshore winds, and vast offshore areas, NL and NS are well positioned to become hubs of offshore wind development with potential for significant energy generation over the coming decades. [42] Despite this, it is only in recent years that Canadian governments have seriously turned their attention to the potential of offshore wind

[42] Cong Dong, Guohe (Gordon) Huang, Guanhui Cheng, Offshore Wind Can Power Canada, *Energy*, Volume 236, 2021.

and the requirements for establishing a regulatory framework.[43] While governments became interested in the potential for offshore wind to help meet emissions reductions targets, it seems to have been the private sector looking to harness its potential for powering green hydrogen facilities for exports to the international market that has been the major catalyst for accelerated development. In Atlantic Canada, the push to develop regulatory schemes in a manner and within a timeframe that is workable for the private sector could present challenges.[44] In light of these challenges, the NL, NS and federal governments have turned to the adaptation of existing regulatory models though incremental change and broadened mandates.

In April, 2022 it was announced that the Canada - Nova Scotia Offshore Petroleum Board ("C-NSOPB") and Canada-Newfoundland and Labrador Offshore Petroleum Board ("C-NLOPB", together with the C-NSOPB, the "Boards") would each be modernized with expanded mandates to include the regulation of offshore wind and green hydrogen production. Each board will be renamed to reflect their expanded mandates. Oil and gas activities in the offshore areas of NS and NL have been regulated through the Boards for the past thirty years. The Boards are jointly organized by the federal government and each of NS and NL pursuant to legislation passed at the federal and provincial levels to implement the goals of the *Atlantic Accord: Memorandum of Agreement Between the Government of Canada and the Government of Newfoundland and Labrador on Offshore Oil and Gas Resource Management and Revenue Sharing* (the "NL Accord")[45] and the *Canada-Nova Scotia Offshore Petroleum Resources Accord* (the "NS

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[43] CanmetENERGY-Ottawa, Buildings and Renewables Group, Natural Resources Canada, *Jurisdictional Scan of Suitable Area, Offshore Wind Development*, March 2020.

[44] *Ibid*.

[45] *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*, RSNL 1990, c C-2; *Canada–Newfoundland and Labrador Atlantic Accord Implementation Act*, SC 1987, c. 3 *Memorandum of Agreement Between the Government of Canada and the Government of Newfoundland and*

Accord"[46] and together with the NL Accord, the "Accords"). The Accords were struck between the federal government and each of NL and NS as a means to cooperatively enable offshore hydrocarbon development in light of concurrent or unsettled provincial and federal jurisdiction and responsibility over offshore areas.[47]

As currently constituted, the Boards have significant regulatory decision-making authority over all aspects of oil and gas projects in the offshore, including licensing, compliance, exploration and decommissioning.[48] While authority over certain "Fundamental Decisions" such as calls for bids remain subject to ministerial approvals, most decisions are made by the respective Boards and are not reviewable.[49] The federal government has taken the first step towards the reformation of the Boards with the tabling of Bill C-49 by the Minister of Natural Resources on May 30, 2023.[50] As expected, Bill C-49 expands the mandates of the CNSOPB and CNLOPB to provide for the regulation of "offshore renewable energy projects", such as offshore wind projects. Accordingly, each of the CNSOPB and CNLOPB will be renamed the "Canada-Nova Scotia Offshore Energy Regulator" and the "Canada-Newfoundland and Labrador Offshore Energy Regulator", respectively. Bill C-49 provides for a land tenure regime and a ministerial decision-making process

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Labrador on Offshore Oil and Gas, 11 February 1985, online: *Digital Government and Service NL* < https://www.gov.nl.ca/dgsnl/files/printer-publications-aa-mou.pdf> [NL Accord].

46 *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation* (Nova Scotia) Act, SNS 1987, c. 3; *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, SC 1988, c 28* [Federal-NS Implementation Act]; *Canada-Nova Scotia Offshore Petroleum Resources Accord*, 26 August 1986, online: *Canada-Nova Scotia Offshore Petroleum Board* <https://www.cnsopb.ns.ca/sites/default/files/resource/accord.pdf>

47 See: *Reference Re Offshore Mineral Rights of British Columbia*, [1967] SCR 792, 65 DLR (2d) 353; *Reference re Mineral and Other Natural Resources of the Continental Shelf*, [1983] 145 DLR (3d) 9, 41 Nfld & PEIR 271; *Reference Re Newfoundland Continental Shelf* [1984] 1 SCR 86, 5 DLR (4th) 385.

48 Federal-NS Implementation Act, *supra* note 46, at s 18.1; NS Accord, *supra* note 47 at s 12.03.

49 NL Accord, *supra* note 47.

50 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*, 1st Sess, 44th Parl, 2023 (first reading 30 May 2023).

regarding the issuance of submerged land licenses to carry out offshore renewable energy projects. It also provides for the introduction of regulations addressing access to offshore infrastructure and the prohibition of petroleum or renewable energy activities in areas that have been, or may be identified as, conservation or protection areas. It is now expected that each of NL and NS will introduce corresponding legislation to provide for the reconstituted Boards. Completing the implementation of these changes is critical as NS is targeting the issuance of calls for bids for offshore wind development by 2025.[51]

In April 2022, on the advice of the federal Impact Assessment Agency, the federal Minister of Environment and Climate Change issued a decision to conduct regional impact assessments with respect to offshore wind development in the NL and NS offshore areas under the *Impact Assessment Act* (the "IAA").[52] Impact Assessments under the IAA are undertaken in areas where future development is anticipated in order, among other things, to coordinate the planning and management of future project-level impact assessments.[53] While there may be some question as to the record of success, regional impact assessments, once developed, are intended to inform and create efficiencies for future project-level assessments by setting:

1. A baseline against which to assess the incremental impact of a discrete project;
2. Thresholds to support future project decisions; and

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[51] Government of Nova Scotia, News Release, "Province Sets Offshore Wind Target" (September 20, 2022), online: <https://novascotia.ca/news/release/?id=20220920003> [NS Offshore Wind Target].

[52] *Impact Assessment Act*, SC 2019, c. 28 [*IAA*]; Minister of Environment and Climate Change, Ministerial Decision, 1, "Regional Assessment of Offshore Wind Development in Newfoundland and Labrador and Nova Scotia" (5 April, 2022), online: *Canadian Impact Assessment Registry* <https://iaac-aeic.gc.ca/050/evaluations/document/146736>.

[53] *IAA*, *supra* note 52, s.93(2); Impact Assessment Agency of Canada, *Regional Assessment under the Impact Assessment Act*, (Guide), (Ottawa: Impact Assessment Agency of Canada, 2022), online: <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/regional-strategic-assessments/regional-assessment-impact-assessment-act.html>.

3. Standard mitigation measures for future projects.[54]

The IAA provides that the federal government may enter into an agreement with a province to jointly establish a committee to conduct a regional assessment. [55] Terms of reference for a joint committee, including the timeframe for the completion of the regional impact assessment, must be developed before work can commence.[56] The terms of reference as well as agreements between each of NS and NL were expected to be in place by the end of 2022 following consultation and comment by the public and indigenous groups. Despite this desired timeline, the final agreements with NS and NL and terms of reference for the regional assessments were not finalized until late March, 2023.[57]

The goal of the regional impact assessments, as represented in the final NS and NL agreements, is to inform future offshore wind planning, licensing and assessments by studying the potential impacts of offshore wind development within the designated study areas in the NL and NS offshore areas.[58] The portions of the Canada-Nova Scotia offshore area and Newfoundland Labrador offshore areas forming part of the Regional Assessment study areas are shown below.[59]

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54 *Ibid*.

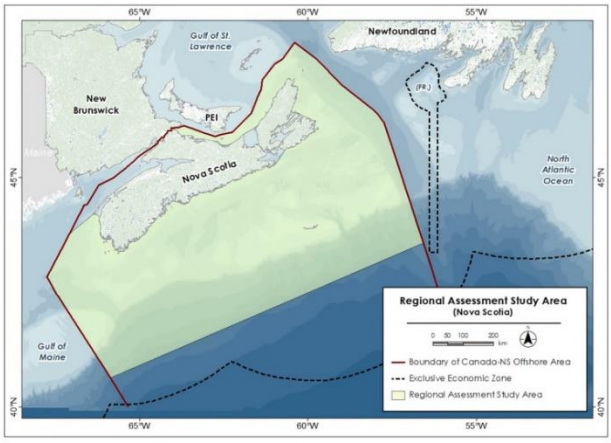
55 *IAA*, *supra* note 52, s. 93(1).

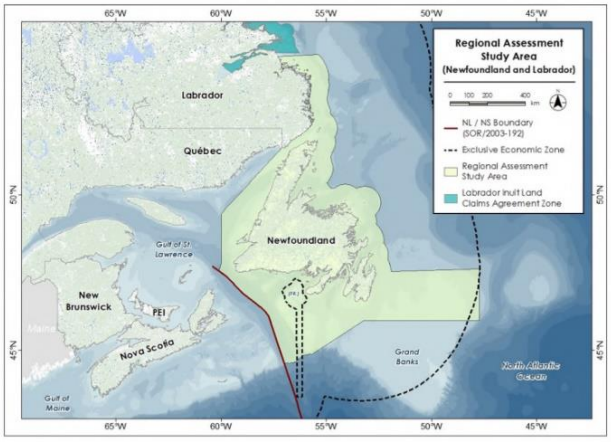
56 *IAA*, *supra* note 52, s. 93(3).

57 *Final Agreement and Terms of Reference between the Governments of Canada and Newfoundland and Labrador*, 23 March 2023, online: *Canadian Impact Assessment Registry* <https://iaac-aeic.gc.ca/050/documents/p84343/147037E.pdf> [NL IAA]; Final Agreement and Terms of Reference between the Governments of Canada and Nova Scotia, 23 March 2023, online: *Canadian Impact Assessment Registry* <https://iaac-aeic.gc.ca/050/documents/p83514/147038E.pdf> [NS IAA].

58 NS IAA, *supra* note 57, ss 1.1, 1.2.

59 NS IAA, supra note 57; NL IAA, supra note 57.





Notably, the Bay of Fundy is excluded from the NS study area as tidal energy testing and development is underway in this region. The committees established under each regional assessment have 18 months to complete their work and deliver a report to the Minister. Based on the final agreements and terms of reference being issued on March 23, 2023, the timeline for completion is September 24, 2024.

In light of the timeframe for the completion of the regional impact assessments, and in furtherance of targets set by the EGCCR and RER, NS has announced a target to offer leases for five gigawatts of offshore wind energy by 2030 to support development of the green hydrogen industry.[60] The first call for bids is scheduled to be issued in 2025.[61] Once the five-gigawatt target is met, subsequent calls for bids will be based on market opportunities.

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60 NS Offshore Wind Target, *supra* note 51.

61 *Ibid.*

Green Hydrogen

The development of offshore wind is often closely associated with green hydrogen production.[62] Increasingly, Europe is looking at green hydrogen as replacement fuel source for various applications given the disruption of Russian gas supplies since the invasion of Ukraine. Green hydrogen has significant potential as an energy source for industrial applications as well as a fuel source. When extracted from a source such as liquid water, hydrogen is flammable and can be used as a combustible source of energy in an engine or to produce electricity in a fuel cell.[63] To date, most of the hydrogen produced in Canada is "grey hydrogen" produced by using natural gas as an energy source.[64]

Green hydrogen is produced using electrolysis, being the process of separating liquid water into its component elements of hydrogen and oxygen through the use of renewable power sources such as wind, solar or hydroelectricity. [65] The advantage of green hydrogen is its very low carbon footprint as compared to other hydrogen production methods. One of the significant challenges associated with green hydrogen developments is the procurement of sufficient renewable or clean power and water to meet the significant energy demands of the electrolysis method. This challenge is particularly acute in jurisdictions such as NS that are still heavily reliant on fossil fuels for electricity generation.

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62 "Green hydrogen" or "renewable hydrogen" appear to be commonly used terms for similar concepts depending on the circumstances. Unless the context requires otherwise, "green hydrogen" will be used throughout this paper.

63 Maddy Ewing at al, "Hydrogen on the path to net-zero emissions: Costs and climate benefits" (July 2020), online: *Pembina institute* <https://www.jstor.org/stable/pdf/resrep25465.pdf?acceptTC=true&coverpage=false> [Pembina].

64 Government of Canada. *Hydrogen Strategy for Canada,* (Ottawa: Natural Resources Canada) online: <https://natural-resources.canada.ca/sites/nrcan/files/environment/hydrogen/NRCan_Hydrogen%20Strategy%20for%20Canada%20Dec%2015%202200%20clean_low_accessible.pdf> at 20 [Canada Hydrogen Strategy];

65 *Ibid*; Pembina, *supra* note 63.

In the last year, NS has made, or committed to make, a number of legislative, regulatory and policy changes to support the development of green hydrogen. NS has committed to issuing a Green Hydrogen Action Plan in 2023.[66] On November 9, 2022, certain legislative amendments intended to support green hydrogen developments received Royal Assent. These amendments included changes to the *Gas Distribution Act*[67], *Pipeline Act*[68], and *Underground Hydrocarbons Storage Act* [69] to : (i) enable pipelines for transporting hydrogen (ii) allow for hydrogen to be included in the province's regulated gas distribution system; and (iii) to permit underground storage of hydrogen. These amendments were minor in nature, but will be required when production commences and producers need to move product to terminals for export or to storage installations. The November amendments to the *Electricity Act* add hydrogen facilities as "wholesale customers" of electricity along with NSPI and municipalities.[70] The November amendment to the *Electricity Act,* also provides that the Minster will create a Hydrogen Innovation Program. The amendment to the *Electricity Act,* is notable given the significant renewable electricity green hydrogen proponents are contemplating purchasing from the grid in advance of dedicated onshore and offshore wind facilities becoming operational in order to meet European standards for exports (discussed in further detail below).

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66 NS Offshore Wind Target, supra note 51

67 Bill 206, *An Act to Amend Chapter 37 of the Acts of 2001, the Underground Hydrocarbons Storage Act, 1st Sess, 64th General Assembly*, Nova Scotia, 2022 (assented to 9 November 2022).

68 Ibid.

69 Ibid.

70 Bill 207, *An Act to Amend Chapter 25 of the Acts of 2004, the Electricity Act, Respecting the Hydrogen Innovation Program*, 1st Sess, 64th General Assembly, Nova Scotia, 2022 (assented to 9 November 2022).

NS also amended certain regulations under the *Environment Act* by Order in Council on December 19, 2022 in support of green hydrogen projects.[71] These amendments were announced following the submission by EverWind Fuels Company ("EverWind") of its application for environmental assessment approval ("EA") to the provincial Minister of Environment and Climate Change on December 9, 2022 (discussed in further detail below) but before EA approval was issued on February 7, 2023 by the Minister of Environment and Climate Change.

The first regulation amended was the *Activities Designation Regulations* (the "ADR") made under Section 66 of the *Environment Act*.[72] The ADR designates certain activities for which industrial approvals are required from the Minister of Environment and Climate Change.[73] The industrial approvals contemplated by the ADR are distinct from EAs. EAs are issued under Part IV of the *Environment Act*, and are viewed as a "tool through which the environmental effects of a proposed undertaking are predicted and evaluated, and a subsequent decision is made on the acceptability of the undertaking."[74] Industrial Approvals covered by the ADR are viewed as operational approvals and are issued under Part V of the *Environment Act.* Industrial Approvals typically set out the terms and conditions under which the approval holder may operate so that the environmental effects are maintained as predicted in the EA.

The *Environmental Assessment Regulations* made under Section 49 of the *Environment Act*, were amended to add a definition for "hydrogen facility" and to suggest that EAs in respect

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71 NS Reg 328/2022; NS Reg 329/2022.

72 *Activities Designation Regulations,* NS Reg. 329/2022, s 3(1) [ADR].

73 *Ibid.*

74 Nova Scotia Department of Environment and Climate Change, *A Proponent's Guide to Environmental Assessment,* (Guide), (Halifax: Environmental Assessment Branch, 2017) online: <https://novascotia.ca/nse/ea/docs/EA.Guide-Proponents.pdf>.

of hydrogen facilities would be considered a Class I undertaking, rather than a Class II undertaking under the *Environment Act*.[75] It is notable that the specific wording of the amendment is somewhat ambiguous and does not necessarily preclude a hydrogen facility from being considered a Class II undertaking:

> *The following are designated as Class I undertakings under the Act:*
>
> *A. Industrial facilities*
>
> *[…]*
>
> *5A. A hydrogen facility, but only if the facility is otherwise designated as a Class I undertaking.* [Emphasis added]

The requirement for a type of an undertaking to be "otherwise designated" as a Class I undertaking is not found elsewhere in the *Environmental Assessment Regulations*. The additional requirement that a hydrogen facility be "otherwise designated" as a Class I undertaking is not mentioned in the explanatory note published in Part II of the *Royal Gazette*, which notes only that the purpose of the amendment is to "designate hydrogen facilities as a Class I environmental assessment."[76] The news release issued by the Department of the Environment and Climate Change announcing the above amendments also does not address this ambiguity but provides that the amendments:

> *…make it clear that [..] large scale projects that produce hydrogen or ammonia require a Class I environmental assessment.*[77] [Emphasis added]

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75 *Environmental Assessment Regulations*, NS Reg. 328/2022, s 2(1), Schedule A – A(5A); It is also notable that, upon receipt of an application for a Class I EA, the Minister has the option of requesting an additional environmental assessment report, which may refer the report to a review panel

76 *Amendment to regulations made by the Governor in Council pursuant to Sections 49 and 66 of the Environment Act*, OIC 2022-326, NS Gaz II, Vol 46 No 26, pg 686.

77 Government of Nova Scotia, News Release, "Province Modernizes Regulations to Support Environmental Protection, Transition to Green Energy" (December 19, 2022), online: <https://novascotia.ca/news/release/?id=20221219002>.

The same news release announcing the above described amendments also states that the amendments:

> *"make clear that […] several operational approvals can be bundled under one clear, facility level approval for hydrogen facilities, thus reducing the administrative burden"*

It should be noted that the December 19, 2022 amendments to the ADR do not specifically provide for the bundling of operational approvals in a manner that is unique to hydrogen facilities, as many designated activities, including those related to Chemicals, already provided that an approval could be issued in respect of "construction, operation and reclamation".[78]

NS reached a significant milestone with the issuance of its first two EAs for green hydrogen projects. The first EA was issued to EverWind in respect of Phase 1 of a project to develop a green hydrogen and ammonia production facility on industrial lands located in Point Tupper on Cape Breton Island ("The Phase I Project"). While the issuance of the EA is a key overarching approval required in respect of a Phase I undertaking, the commencement of specific construction activities remains contingent on the proponent obtaining all other necessary approvals, permits or authorizations required by municipal, provincial and federal acts, regulations, by-laws, guidelines, policies or standards, or otherwise required by the EA.

The Phase I Project is to be developed on lands acquired by EverWind that were formerly operated as a fuel storage terminal.[79] EverWind submitted its application for a Class I EA, in

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[78] ADR, *supra* note 72, s 12.

[79] Strum Consulting, "Point Tupper Green Hydrogen/Ammonia Project Phase 1: Environmental Assessment Registration Document" (December 2022), online: *Nova Scotia Environment and Climate Change* <https://novascotia.ca/nse/ea/everwind-point-tupper-green-hydrogen-ammonia-project/everwind-ea-registration-document.pdf> [EverWind RD].

accordance with Part IV of the *Environment Act* on December 9, 2022.[80] The Minister of Environment and Climate Change approved the undertaking by granting an Environmental Assessment approval for the Project on February 7, 2023 subject to a number of conditions discussed below. According to EverWind's *Environmental Assessment Registration Document* (the "EverWind RD") submitted in support of its EA application, the Phase I Project, which is anticipated to commence construction in 2023, will be comprised of the following:

1. 300-megawatt hydrogen electrolysis plant;
2. 600 metric tonne per day ammonia production plan;
3. 230 kilovolt substation and power distribution system; and
4. A marine loading pipeline for liquid ammonia product distribution to shipping vessels.[81]

The Phase I Project contemplates obtaining all of its electricity needs from NSPI.[82] The electricity needs expected for the EverWind hydrogen plant are significant. According to the EverWind RD, it is estimated that the electrical power requirements from NSPI will be 4,500 to 5,000 megawatt hours per day with an estimated peak capacity of 8,400 megawatt hours per day.[83] For context, in 2019 the electricity generated in NS per day was approximately 26,575 megawatt hours.[84] In 2021, only approximately 30 % of electricity generated in NS came from renewable

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80 Nova Scotia Environment and Climate Change, *EverWind Point Tupper Green Hydrogen/Ammonia Project – Phase 1*, (Environmental Assessment), (Halifax: Department of Environment and Climate Change, 2003) online: <https://novascotia.ca/nse/ea/everwind-point-tupper-green-hydrogen-ammonia-project/>.

81 EverWind RD, *supra* note 79 at 1.

82 EverWind RD, *supra* note 79 at 4.

83 EverWind RD, *supra* note 79 at 58.

84 Canada Energy Regulator, *Provincial and Territorial Energy Profiles – Nova Scotia* online: <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-nova-scotia.html>; Note that this calculation is based on 9.7 terawatt hours per year averaged over 365 days and divided by 1,000 to convert to megawatt hours.

sources. [85] In order to qualify as renewable hydrogen under European Union standards, hydrogen produced from renewable sources must result in 70 % greenhouse gas emissions reduction.[86] Given the significant renewable energy demands and current limitations for the grid to provide renewable electricity, meeting this criterion could be a challenge. The EverWind project is expected to involve the construction of a major onshore wind project to provide added renewable energy to support hydrogen development. [87]

In December 2022, EverWind announced that it had entered into a memorandum of understanding (the "MOU") with the NS provincial government. The MOU provides for a "…process for EverWind to exclusively apply for and obtain a lease of the Crown Land subject to the MOU. Such Crown Land is projected to support the development of approximately two gigawatts of onshore wind generation capacity." Further, EverWind maintains that the "…intended onshore wind farm will enable EverWind to reach 1 million tonnes of annual green ammonia production capacity by 2026."[88] According to EverWind, its proposed onshore wind project would be the "largest in the Western Hemisphere."[89] As the existing EA issued to EverWind only relates to the hydrogen facilities itself, a separate EA will be required for the wind project prior to

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85 Nova Scotia Power Incorporated, "Powering a Green Nova Scotia, Together" online: *Clean Energy Sources*, <https://www.nspower.ca/cleanandgreen/clean-energy/clean-energy-sources>.

86 EC, *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 (recast)*, [2018] OJ, L 328/22, art 25, online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC> ("RED II"); EverWind RD, *supra* note 79 at 3.

87 EverWind Fuels, "EverWind Fuels Announces Memorandum of Understanding for Crown Land Leases to Power its Green Hydrogen Hub in Nova Scotia, " online: <https://www.globenewswire.com/news-release/2022/12/22/2578937/0/en/EverWind-Fuels-Announces-Memorandum-of-Understanding-for-Crown-Land-Leases-to-Power-its-Green-Hydrogen-Hub-in-Nova-Scotia.html>.

88 *Ibid*.

89 EverWind Fuels, "Our Project at Point Tupper", online: https://everwindfuels.com/projects/point_tupper

construction. As noted above, the current regulatory framework will require a Class I rather than Class II EA. It is also expected that the EverWind project will be looking to obtain energy from offshore wind installations once operational as a means to provide more renewable energy and meet expansion goals.[90] EverWind expects to make its first commercial shipments of green hydrogen/ammonia in the fall of 2025, presumably relying on agreements with NSPI regarding the purchase of renewable electricity.[91]

An EA for a second hydrogen facility in the Point Tupper was granted to Bear Head Energy Inc. ("Bear Head") on April 12, 2023. According to the registration document submitted as part of the Bear Head EA application:

> *The Project involves the construction, operation and decommissioning of a green hydrogen and ammonia production, storage and loading facility. The Project will be constructed in multiple phases driven by the availability of renewable power. At full build-out, the Project will be capable of producing 2 million tonnes per annum (mtpa) of green ammonia (e.g., wind, hydro, tidal, solar) to run the facility.*[92]

Like the EverWind Phase I Project, the Bear Head application considers drawing renewable electricity from the NS grid, or from new onshore and offshore facilities.[93] Bear Head maintains that its energy needs will be as follows:

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90 Atlantic Business, "EverWind takes early lead in Atlantic hydrogen push", (12 September 2022), online: <https://atlanticbusinessmagazine.ca/web-exclusives/everwind-takes-early-lead-in-atlantic-hydrogen-push/>; Globe and Mail, "Nova Scotia's EverWind signs green ammonia deal with Germany's Uniper", (23 August 2022), online: <https://www.theglobeandmail.com/business/article-nova-scotia-everwind-green-ammonia-uniper/ >.

91 EverWind RD, *supra* note 78 at 31;

92 Stantec, "Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility: Environmental Assessment Registration" (February 2023), online: *Nova Scotia Environment and Climate Change* <https://novascotia.ca/nse/ea/bear-head-energy/bhe-ea-registration-document-1-3.pdf> [BH RD].

93 *Ibid.*

> *Hydrogen production is based on an average of 2,860 megawatts (MW) power input with an average of 2,000 MW consumed by the electrolysers and an average of 860 MW consumed in the… ammonia synthesis unit and balance of the plant at full build-out.*[94]

In 2020, NS amended the *Electricity Act* to provide for the creation of the "Green Choice" program to give large electricity customers the ability to purchase renewable electricity from new renewable energy projects. The Green Choice program was initially promoted as a means to enable NS to perform in its agreement with the federal government to procure 100 % renewable electricity for all federally owned facilities in the NS.[95] The first expressions of interest to participate in the program were to be submitted on May 12, 2023. While it is not clear that hydrogen facilities would fall under the Green Choice program, it is instructive as an example of NS creating a regulatory mechanism whereby energy customers can purchase certified renewable electricity. The ability to certify the purchase of renewable electricity from the grid could be critical for hydrogen proponents seeking to comply with EU regulations for imported renewable hydrogen.

4. OFFSHORE WIND IN EUROPE

European countries have traditionally relied heavily on imports of energy for heat and electricity from more resource abundant countries such as Russia. While the heavy reliance on imported energy has likely led to European countries being early leaders in developing domestic renewable energy production, reliance on imported energy has remained strong into the 2020s. In 2020, the EU as a whole produced 42% of its own energy, while 58% was imported.[96] In

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94 *Ibid.*

95 Government of Nova Scotia, News Release, "Government Amends Electricity Act" (February 26, 2020), online: https://novascotia.ca/news/release/?id=20200226008

96 Eurostat, "Where Does Our Energy Come From?", online: https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html#:~:text=In%202020%2C%20the%20energy%20mix,solid%20fossil%20fuels%20(12%20%25) [Eurostat]

furtherance of the goals of the *European Green New Deal*, the EU is pursuing a target of 40% renewable energy sources for the EU's overall energy mix by 2030.[97]

Offshore Wind in Europe

Europe is regarded as the "first mover" for offshore wind. The first offshore wind installation in Europe was installed near in Vindeby, Denmark in 1991.[98] While countries such as Canada and the United States ("US") are now aggressively pursuing offshore wind, Europe has achieved "technical and commercial maturity" in offshore wind.[99] The EU has developed strong domestic industries and supply chains for offshore wind, with the capability to produce nearly all of the components required for offshore wind installations."[100] As of 2020, there was 12 GW of installed offshore wind capacity in Europe.[101] The scaling up of offshore wind deployment has become a major policy objective of the European Commission which has set a goal of 60 GW of installed offshore wind capacity by 2030 and 300-400 by 2050.[102]

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97 European Commission, "Renewable energy targets", online: <https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en#:~:text=The%202030%20targets,-Building%20on%20the&text=It%20seeks%20to%20increase%20the,overall%20energy%20mix%20by%202030>.

98 European Commission, "Offshore renewable energy", online: <https://energy.ec.europa.eu/topics/renewable-energy/offshore-renewable-energy_en> [EU Offshore Energy].

99 Maite DeCastro et al, "Europe, China and the United States: Three different approaches to the development of offshore wind energy" (2019) 109 Renewable and Sustainable Energy Reviews 2019 at 55-70.

100 EC, *Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions: An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future*, [2020] COM/2020/741 final, online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:741:FIN&qid=1605792629666>.

101 *Ibid.*

102 *Ibid.*

The regulatory regimes for offshore wind in Europe vary from country to country, however similar regulatory approaches have emerged. Most offshore wind projects to date have been constructed by private entities, with varying levels of government incentives, including:

1. Feed-in-Tariffs;
2. Feed-in-Premiums;
3. Tradeable Green Certificate. [103]

Significant players in the offshore wind industry include Ørsted, Vattenfall, General Electric, and ENbW.[104] Certain projects have been constructed as joint ventures or by a consortium of entities.[105] Offshore wind projects in Europe have attracted international investment.

To promote the development of offshore wind sites, it has been standard practice for governments to approve or authorize development sites, and then open these sites up to a bidding or tendering process. This has helped to reduce the regulatory burden on offshore wind developers, as governments can provide assurances that the areas open for tendering will meet all applicable permitting requirements, as well as comply with all international treaty obligations. Until recently, Denmark retained an "open-door" policy, which allowed private offshore wind developers to

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[103] European Commission, "The regulatory framework for wind energy in EU Member States Part 1 of the Study on the social and economic value of wind energy - WindValueEU", online: <https://energy.ec.europa.eu/topics/renewable-energy/offshore-renewable-energy_en>.

[104] Orsted, "Offshore Wind: Leading the global green energy transition", online: <https://orsted.com/en/our-business/offshore-wind#:~:text=%C3%98rsted%20is%20the%20global%20leader,offshore%20wind%20capacity%20by%202030>; Vattenfall, "Wind Power: We are accelerating fossil free living with the power of renewables", online: <https://group.vattenfall.com/what-we-do/our-energy-sources/wind-power>; General Electric, "GE's offshore wind farm technology", online: <https://www.ge.com/renewableenergy/wind-energy/offshore-wind>; EnBW, "Offshore wind farms: Wind energy in the middle of the sea", online: <https://www.enbw.com/renewable-energy/wind-energy/our-offshore-wind-farms/>.

[105] DeCastro et al, *supra* note 99.

propose new sites.[106] This process is generally more cumbersome for developers as they frequently are required to undertake extensive inspections and site assessments themselves.

Europe is currently viewed as a major import market for green hydrogen produced in Atlantic Canada. This requires governments and green hydrogen proponents in NL and NS to be compliant with EU rules and regulations regarding the classification as "green" of "renewable" hydrogen. The 2018 *Renewable Energy Directive*, which entered into force in 2018 ("RED II"), applies to renewable hydrogen.[107] Under RED II, renewable hydrogen is considered a "renewable liquid and gaseous transport fuels of non-biological origin" ("RFNBO").[108] From 2018 until February, 2023, there was ambiguity regarding when hydrogen would be considered "renewable" or "low-carbon." There was similar ambiguity regarding approved sourcing of renewable energy by hydrogen producers. On February 13, 2023, the European Commission introduced the *Delegated Regulation on Union Methodology for RFNBOs*, a delegated Commission regulation under RED II (the "RFNBO Regulations").[109] The RFNBO Regulations introduce a methodology to ensure that the electricity used to produce RFNBOs is considered renewable. The RFNBO Regulations will apply to fuel producers in Europe as well producers abroad looking to export to the EU. Accordingly, these rules will be important for Canadian exporters of hydrogen.

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106 Denmark Energy Agency, "Procedures and Permits for Offshore Wind Parks", online: <https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits>.

107 RED II, *supra* note 86.

108 *Ibid*, at Art.4.

109 EC, Commission Delegated Regulation (EU) of 10.2.2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin, online: https://energy.ec.europa.eu/system/files/2023-02/C_2023_1087_1_EN_ACT_part1_v8.pdf ("RFNBO Regulations").

Under the RFNBO Regulations, electricity is considered to be renewable when it is obtained through a direct line to a renewable energy generating facility, or if the renewable energy and fuel are produced at the time site. In an effort to boost the amount of renewable energy available for the grid generally, the RFNBO Regulations provide that the renewable energy generating installation connected via direct line must have become operational less than three years in advance and not be connected to the grid. The RFNBO Regulations also set out criteria for when electricity drawn from the grid is considered fully renewable. Electricity drawn from the grid is considered to be fully renewable in the following circumstances:[110]

1. if the fuel producer is located in a "bidding zone" where renewable electricity accounts for 90 % or more of the proportion of electricity in that bidding zone;

2. If the fuel producer is located in a bidding zone where the emission intensity of electricity is lower than 18 gCO2e/MJ, and Power Purchase Agreement ("PPA") are entered into which meet temporal and geographical correlation requirements (discussed below); or

3. If the electricity is consumed during an imbalance settlement period during which the RFNBO producer can show that it reduced the need for downward redispatching of renewable electricity generation.

If electricity obtained from the grid is not captured by items 1-3 above, it can still be considered fully renewable if the producer can meet certain additionality, geographical correlation and temporal correlation requirements:

1. Additionality: fuel producers must produce an amount of renewable electricity in their own facilities that is at least equivalent to the amount of electricity claimed as fully renewable, or have concluded directly, or via intermediaries, one or more PPAs with producers of renewable electricity for an amount of renewable electricity that is at least equivalent to the amount of electricity that is claimed as fully renewable and the electricity claimed is effectively produced in this or these installations, provided: (i) the installation producing renewable electricity must not have been in operation for more than 36 months before fuel

[110] *Ibid, at* Art. 3.

production, and (ii) it must not have received support in the form of operating aid or investment aid.

2. Temporal Correlation: renewable electricity generation under the PPA and fuel production occur during the same calendar month.

3. Geographic Correlation: At least one of the following is met regarding the location of the renewable electricity generator: (i) The renewable electricity generator must be in the same bidding zone as the electrolyser; (ii) in an interconnected bidding zone with electricity prices in the day-ahead market equal or higher than the bidding zone where the hydrogen is produced; and (iii) in an offshore zone interconnected with the electrolyser's bidding zone.

The RFNBO Regulations provide for a transitional period with respect to the additionality requirements which will not apply to producers until 2038 so long as those producers become operational prior to January 1, 2028.

5. CHALLENGES AND DISCONNECTS FOR NS AND NL

Newfoundland and Labrador

The regulatory environment for wind development in NL is immature and uncertain. The relative absence of onshore wind development to date in NL is a significant challenge for governments and project proponents now seeking to expedite of the proliferation of green hydrogen development and the associated development of wind resources. NL largely rebuffed wind energy development for a number of reasons, as described above. Now that the wind to hydrogen industry offers the potential to produce export revenues rivalling those of oil and gas, the province is attempting to capitalize on its bountiful wind resources by attracting the industry to the province. While government has attempted to move with haste, there is corresponding waste. Functionally, there is little government could do to avoid this given the lack of wind development in NL. NL is faced with three major challenges: (i) timely site control for proponents; (ii) fiscal modelling; and, (iii) grid capacity.

(i) Timely Site Control

In terms of site control, the process described above for securing land was under consideration by the Government of NL for nearly a year before proponents were able to make the first overture with land bids being due as of March 23, 2023. While there is some private land potentially available for sale or lease, projects of this nature require significant acreage for wind farms, and a site for an electrolyser facility, all with access to a sea port for export. In NL, this will in most cases require the acquisition of Crown lands.

The two-phase land bid process basically entitles a proponent an exclusive right to *apply for*, not obtain, a lease or grant in respect of the Crown land. Therefore, once a bidder obtains the exclusive right, all they have won is the right to be at the first step of the default Crown land application process.

The Crown land process in Newfoundland and Labrador is infamous. It is a time-consuming process involving consultation with myriad provincial government departments. While some of the issues will have been addressed by virtue of the land nomination process, the provincial government has not warranted good legal title to the land that has been put up for bids. On this basis, once a proponent is successful in the bidding process, it will still have to undertake serious due diligence issues, including but not limited to:

- Assessing any previously granted titles on the property;
- Assessing whether the Crown has been adversely dispossessed of the property;
- Assessing land use restrictions;
- Assessing municipal zoning;
- First Nations consultation, where applicable; and

- Environmental Assessment.

The province's antiquated system for land titles presents a significant problem in ramping up this industry quickly. Unlike in other Canadian provinces, there is little in the way of a property identification system; instead, the system is rooted in adverse possession against the Crown. In order to assess title of real property in NL one must do a title search that is primarily name-based. However, the owner of real property is not always clear. Under NL law, individuals can acquire squatters' rights over Crown Land, if they have been in open, notorious and adverse possession since 1957.[111] No publicly searchable registration is required. In remote areas, this can create challenges – not the least of which is finding affiants who can reliably testify to open and notorious possession over 65 years ago. Often aerial photography is used to assist proponents to determine whether there are any such unregistered private interests to be addressed, which then leads to a difficult assessment of how long those private interests have been in place and the extent to which they have properly dispossessed the Crown.

The knock-on effect of this long-standing policy problem will mean delays in getting the green hydrogen industry off the ground. A recent report of the Canadian Bar Association report indicated that the Newfoundland and Labrador system is unsustainable and has become an obstacle to the proper functioning of real estate law in Newfoundland and Labrador, even on the most basic of land transactions. [112] Beyond the problems with the *Lands Act* system rooted in adverse possession, it routinely takes years to work through the bureaucratic channels, most particularly the Crown

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[111] Proposed amendments to the *Lands Act* contemplate changing from 1957 to 1967.

[112] Canadian Bar Association, Newfoundland and Labrador Branch, "Reforming the Law on Adverse Possession", online: https://lsnl.ca/wp-content/uploads/2021/05/Reforming-the-Law-on-Adverse-Possession_CBA-NL-Final-Report-May-2021.pdf

Lands division of the Department of Fisheries, Forestry and Agriculture, to obtain a certified interest in land from the Crown.

In order for the Government of NL to grant actual title, whether by a grant or a lease, it will need to rule out any adverse possession. In order for proponents in NL to be first-movers, the government will need to either consider more resources for analysis of these issues, prioritize wind-to-hydrogen proponents, or some combination of both measures.

In our view, in order to facilitate the wind-to-hydrogen industry, NL should seriously consider expropriating the nominated Crown lands for projects to ameliorate any issues in respect of potential squatters on ostensible Crown land.[113] This would immediately provide certainty to proponents and government alike, thereby short-circuiting the due diligence exercise typically required. At worst, the Government of NL would have to pay out the value of any squatter's rights, which would likely come at a minimum cost given the relative low value of most of these lands at present. At best, government and proponents alike would avoid needless delays associated with the due diligence required under the province's current antiquated system. Given the billions of dollars it expects in tax revenue, which is discussed in greater detail in the next section of this paper, the potential benefits clearly outweigh the potential costs.

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[113] Care would of course need to be taken in respect of avoiding expropriation where other land tenure regimes apply, most notably pre-existing mineral land tenure rights.

(ii) Fiscal Modelling

Related to site control is uncertainty in relation to what the Government of NL intends to charge for the Crown land. As was stated above, for a singular project over a 30-year period, the Government of NL projected a total of $3.5 billion in taxes, royalties and fees.

In its fiscal framework discussed in further detail above, Government of NL announced two main fees: (1) a Crown Land Reserve Fee of 3.5% of the market value of reserved lands, with payments beginning upon award of "exclusive right to pursue projects on lands"; and, (2) a Crown Land Lease Fee, which is an annual charge of 7% of the market value of land, with payment beginning upon issuance of a Crown Land lease.

It is unclear how market value is to be determined. The most logical approach is the direct comparison approach to valuation; however, Government has not publicly indicated what it considers to be appropriate comparators for these lands. Thus, while the rate of 3.5% is clear, it is unclear what value to which government will apply that rate.

More problematic is the market value at the Crown Land Lease Fee stage. At a 7% rate, by the 14-15 year mark on a project, a project proponent will have paid the Government of NL the total estimated market value of the property with all payments beyond that point being an effective tax. Furthermore, the question remains, how is "market value" to be calculated? Presumably, it will be something more than the value of the land in a vacant state. However, if it is the market value of the land after a proponent has invested billions of dollars in fixtures to be affixed to the land, then the 7% fee will effectively be a 7% tax on a proponent's own investment. This is over and above the wind electricity tax ($4,000 per megawatt on installed capacity, which equates to $1,000,000 for a 250 MW windfarm), the water use fees/royalties, and generally applicable taxes.

It is too early to determine whether these fees are prohibitive, and in fairness to the Government of NL, there is no clear precedent available given the nascent nature of the industry in this region. These questions will need to be answered with more certainty for project proponents to make the significant investments required for these projects.

(iii) Grid Capacity

A green hydrogen industry requires that the electricity used to power the electrolyser facilities is in fact "green". While this requirement is met when a project's dedicated wind turbines are operating, a back up source of green power is necessary.

At the time of the announcement of the amended OC discussed above, NL was citing that it had already received 8000 MW of requests for energy, which is four times the current capacity of the provincial system as a whole. This, coupled with problems with the Labrador Island Link (the "LIL", the transmission line bringing clean renewable power from Muskrat Falls to the island portion Newfoundland and Labrador) may mean that these projects will have to operate on a substantial dispatchable basis, rather than in reliance upon firm capacity. While the LIL has now been commissioned, there remains skepticism as to its reliability over time in regulatory proceedings. A recent report submitted to the province's Public Utilities Board provided a bleak outlook on both the commissioning and overall reliability of the LIL:

> *Commissioning Progress*
>
> *...History commends pessimism regarding GE's estimate that it can complete all the work required to ready the LIL for passing the overload test during the first quarter of this year. The failure also underscores the concern we have now expressed for some time about the LIL's longer-term ability to reach a state of*

> *reliable operation at full power with all of the capabilities of its design requirements.*[114]

Even where the LIL performs well, it remains unclear the extent to which firm capacity will be available for a series of projects expecting 250 MW output or more in rural areas. It is also unclear whether the proposed wind to hydrogen projects may be economical without firm backup power – whether on a long-term basis or until further transmission and distribution networks are created. To the extent further transmission or distribution networks need to be created to reach areas where large amounts of electricity have not been historically required, NL Hydro will need to justify that expense in the context of the broader system which itself expects demand growth continued electrification and the expected proliferation of electric vehicles. In this regard, the importance of this detail is a matter of further study.

As the impacts to the grid represent 15% of on the evaluation criteria under Phase 2 of the bid process (which is the same weight as applied to the qualities of the bidder themselves), proponents are well advised to understand NL Hydro's position on the feasibility of prospective projects and their power needs well in advance of the completion of the Phase 2 process.

Nova Scotia

The main challenges facing NS for future onshore, offshore and hydrogen development are primarily related to the scale of new wind installations and aggressive timelines. Specific

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[114] Board of Commissioners of Public Utilities Newfoundland and Labrador, *Eighteenth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System*, (Report), (Lebanon, PA: The Liberty Consulting Group) online: <http://www.pub.nl.ca/indexreports/libertyquarter/The%20Liberty%20Consulting%20Group%20Eighteenth%20Quarterly%20Monitoring%20Report%20-%202023-02-09.PDF> at 6.

challenges discussed below include (i) demand for renewable energy; (ii) the suitability of existing regulatory frameworks; and (iii) supply chain and procurement issues.

(i) Demand for Renewable Energy 2023-2030

NS has committed in law to require that 80% of the electricity NSPI delivers to its customers to be produced by renewable sources 2030. Concurrently, NS is aggressively promoting the rapid development of green hydrogen/ammonia exporting facilities with very significant renewable electricity requirements. The renewable energy requirements for green hydrogen facilities, at least in the short term, are expected to the met by renewable power purchased from the grid. As discussed above, under the RER the onus for meeting the renewable energy target falls almost exclusively to NSPI. Before any of the five new onshore wind projects come online, it may be a challenge to meet the renewable energy needs of the Province as a whole, including renewable electricity to be delivered to hydrogen facilities under PPAs. To date, it is expected that the five new projects will provide electricity to the grid. Any delay in completing the five new onshore projects or proposed hydrogen dedicated onshore facilities could compound the potential problem. Related technical issues such as load balancing and energy storage will need to be addressed concurrently.

(ii) Suitability of Existing Regulatory Schemes

The EA requirements for onshore wind installations, regardless of size, are consistent. In other words, the same level of review, public outreach and consultation would be required for a 3MW onshore facility as would be the case for a 2,000 MW facility. The geographic scale and size of the turbines themselves could be very different for such large-scale projects. Public reaction to the unprecedented scale of new large onshore facilities remains to be seen. A tool similar to

regional impact assessment which would provide baseline study and engage in consultation before project specific approvals are sought does not exist. For these new large onshore wind facilities intended to power hydrogen facilities, it would appear that the responsibility for filling gaps in consultation and public engagement arising from the less onerous Class I EA process will fall to the developers prior to submissions for EA approval. Public opposition will test the resolve of the Minister of Environment and Climate Change who retains the power to refer a Class I undertaking to a public review panel, in effect converting the Class I undertaking into a Class II undertaking.[115]

With public pressure comes the possibility of delays to approvals and construction. Any delays to the construction of these large onshore facilities will likely cause problems for hydrogen developers seeking to reach desired scale for export. It is unclear if the NS government's forthcoming Hydrogen Action Plan will specifically address any gaps or regulatory amendments being considered for onshore wind. Government has a further role to play in order to promote the development of the industry, appropriately manage the expectations of the public and relieve the burden on developers.

The scale of investment for commercially viable green hydrogen or ammonia destined for the export market is significant as it entails an interconnected series of projects, encompassing power facilities, on land and subsea transmission lines, an electrolyser facility, on- land pipelines, docking facilities and purpose-built ships. Each component is dependent upon the others for viability and delays in any component will delay the whole enterprise.

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[115] *Environment Act*, SNS 1994-1995, c 1 at ss 34(1)(c), 38(1)(c).

(iii) Supply chain and procurement

The number of onshore projects being considered for NS between 2023 and 2030, as well as future offshore developments, may present supply chain challenges which could make meeting deadlines difficult.[116] With Europe, the US and China all looking to dramatically increase the number of wind turbines deployed, it could be challenging for developers in NS to obtain components required for future developments within desired timelines. The US, China, India, Spain and Germany are the only countries that can produce all of the major components required for the construction of a wind turbine.[117] The following are challenges for the US domestic supply chain for wind development which could be instructive when considering Canadian challenges:[118]

1. A lack of demand certainty in the wind energy project pipeline provides limited motivation for new supply chain investments; near-term domestic manufacturing capacity may even contract due to forecast reductions in annual installations in 2022 and 2023.

2. There is a lack of domestic supply chain capacity in a few components and materials (specifically semiconductors, rare earth elements, carbon fiber, metal castings, and specific nacelle components), especially for offshore wind.

3. Shortages of rare-earth magnets and fundamental commodity price risks could disrupt supply chain activities, erode U.S. competitiveness, and jeopardize deployment ambitions.

4. There is a need to scale up and commercialize wind turbine recycling, especially for blades (glass and carbon fibers).

5. Overseas competitors with low labor costs threaten U.S. supplier competitiveness, especially for labor intensive operations such as blade manufacturing.

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116 US, Department of Energy, *Wind Energy: Supply Chain Deep Dive Assessment*, (Washington, DC: Department of Energy, 2022) online: <https://www.energy.gov/sites/default/files/2022-02/Wind%20Energy%20Supply%20Chain%20Report%20-%20Final.pdf>.

117 *Ibid.*

118 *Ibid.*

6. Expected new workforce demand to serve the Administration's goals is likely in the hundreds of thousand. Additional education and training programs are expected to be necessary; scenarios range from several hundred new programs to more than 1,000.

7. Retooling existing manufacturing facilities as turbine size increases will be required.

8. Technology evolution, including increasingly larger wind turbine components, drives the need for facility upgrades and retooling and compounds difficult transportation hurdles.

While NS is committed to massive onshore wind development before 2030 in order to meet renewable energy targets and provide energy for green hydrogen development, the commercial realities of wind supply chains seems destined to make meeting these targets challenging.

6. CONCLUSIONS

Certain challenges related to future wind and green hydrogen development are shared by both NS and NL. The paths of each province for offshore wind appear to be on parallel tracks with mirror regional impact assessments under way in partnership with the federal government. Accordingly, we might expect a consistent regulatory approach under the authority of the reconstituted Boards. It is a major asset for NL and NS that each, in partnership with the federal government, already has an offshore regulator with decades of experience regulating calls for bids licensing, compliance, exploration and decommissioning in the offshore. With many countries around the world planning to dramatically accelerate offshore wind development before 2030, it is critical that the Boards be reconstituted and regulatory regimes for offshore wind clarified in a timely manner. NS and NL will be competing with European nations with existing offshore installations governed by well-established and understood regulatory regimes.

The challenges faced by NL and NS are somewhat different for future onshore wind development. NS has much longer history of onshore wind development with pre-existing

regulatory frameworks in place concerning crown land tenure, requests for proposals, power purchasing and grid interconnection. NL is currently grappling with these issues with the moratorium on onshore wind project development only recently being lifted. As explained above, where NL lands on some of these questions for onshore wind could have a significant impact on some aspect of offshore wind activities as well.

There are also divergent challenges regarding green hydrogen development and associated renewable electricity requirements for NL and NS given the differences in their underlying energy mix and pursuit of renewable energy targets. NS must balance the significant renewable electricity needs of new green hydrogen facilities against its pre-existing renewable electricity commitment to existing customers. Before new onshore and offshore wind installations come online, it may be a challenge for green hydrogen facilities to obtain sufficient renewable electricity to produce green hydrogen on the scale desired. Subject to overall grid infrastructure constraints, this may be less of a problem in NL where the energy mix is expected to be derived from 98 % renewable sources before any new wind facilities are brought online.