

Nova Scotia – United States Transmission Connection Socioeconomic Study

Final Report



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ACKNOWLEDGEMENTS

The Nova Scotia – United States Transmission Connection Socioeconomic Study is a research project developed and led by Net Zero Atlantic. The research was conducted by WSP in partnership with Power Advisory LLC. The project is supported by funding from the Nova Scotia Department of Energy.



Letter from Net Zero Atlantic

Net Zero Atlantic is pleased to share the findings from the Nova Scotia – United States Transmission Connection Socioeconomic Study with our research colleagues and stakeholders.

The project was set to provide a comprehensive socioeconomic assessment of a proposed subsea transmission cable connecting Nova Scotia's offshore wind resources to New England, examining how such a project could enable additional offshore wind development and deliver economic, workforce, and social impacts across the region.

We would like to thank our project funder, Nova Scotia's Department of Energy. This project aims to support Nova Scotia's energy policy objectives, focusing on climate change, economic growth and sustainable development.

To conduct the work, we needed an experienced team with in-depth knowledge of our region. We would like to thank the consulting firms WSP and Power Advisory LLC. for their assistance in undertaking this important work and for providing us with this thorough report.

We would also like to acknowledge the participation of provincial government staff involved in the study's review process.

Thank you for reading.

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1 EXECUTIVE SUMMARY

Nova Scotia possesses world-class offshore wind (OSW) resources, with high wind consistency, favorable subsea geology, and strategic proximity to U.S. energy markets. The province has set an ambitious target to unlock up to 5,000 megawatts in the first Call for Bids. The Province's Wind West initiative would harness the world-class wind resources of Nova Scotia and deliver clean, reliable power to the Eastern region and help meet rapidly growing demand while strengthening its energy security and economic prosperity. To unlock the full economic and environmental potential of this resource, a subsea high-voltage direct current (HVDC) transmission cable connecting Nova Scotia to the northeastern United States is under consideration. This study, commissioned by Net Zero Atlantic, evaluates the socioeconomic impacts of such a subsea cable project (the Project), including its potential to enable OSW exports, stimulate investment, create jobs, and affect communities across Nova Scotia.

1. Economic Opportunity

The development of a subsea transmission cable presents a significant economic opportunity to the province of Nova Scotia. The conceptual design selected to conduct the socioeconomic impacts of this project was estimated to require \$7.60 billion in capital over a period of five years. Additionally, \$155 million in sustaining capital was estimated to be required over an assumed period of 30 years, with \$4.56 billion in operating and maintenance expenses.

Input-output modelling was conducted, which stimulates the economic impacts of expenditures and calculates the resulting direct, indirect and induced economic impacts. Based on modelling assumptions from Statistics Canada, it was assumed that 38 percent of the subsea cable capital costs would be met by within Nova Scotia spending. The construction of the subsea cable was estimated to result in a total of approximately 6,000 full time equivalent jobs on a yearly basis during the five-year period (of which approximately 3,000 would be direct, 2,000 would be indirect, and 1,000 would be induced jobs). The resulting Gross Domestic Product (GDP) impact to Nova Scotia from the subsea cable construction was estimated to be \$729 million per year, or approximately \$3.65 billion over the 5-year period. Additionally, an estimated 881 jobs (542 direct, 162 indirect and 177 induced), would be created for the operation of the subsea transmission cable, with an annual GDP contribution of \$139 million per year.

The construction of a subsea cable would enable significant buildout of offshore wind resources, and the GDP contribution and job impacts enabled by the subsea cable were also considered as part of this study. OSW capacity buildout enabled by this project could be in excess of 2,000 MW transmission capacity in order to allow for greater utilization of the transmission line when the offshore wind farms are producing below their maximum output capacity. Based on the capital cost assumptions highlighted in this report, a buildout of 2,157 MW in offshore wind capacity would equate to approximately \$16.50 billion of investment. The impacts of the enabled offshore wind buildout would be significant with an additional 7,866 total jobs estimated and an additional annual GDP contribution of \$1.32 billion per year.

2. Workforce and Skills Development

Significant direct and indirect jobs would be created across numerous sectors for the development of both the subsea cable and the enabled offshore wind development in Nova Scotia. Subsea cable and offshore wind development in Nova Scotia can require a broad range of occupations across all project phases, with demand for skilled trades, maritime operations, and technical roles such as turbine and Remotely Operated Vehicle (ROV) technicians.

Interview findings from this study highlight a strong existing workforce with consistent areas for skill and knowledge growth related to OSW development across occupations. While many core skills may be transferable from adjacent industries, most roles may require adjustment for marine-specific conditions.

Specifically, subsea cable development will draw from transferable skills from established Nova Scotia industries such as oil and gas, shipbuilding, and marine sectors. It may also demand additional training in HVDC systems, thermal modeling, and subsea installation techniques.

3. Education and Training Capacity

NSCC, Dalhousie, and other Nova Scotian educational institutions offer innovative and relevant programs to produce a highly skilled trades workforce. To meet additional and new labour demands, program capacity may need to increase. In addition, existing programs may need adjustments to support the development of a strong subsea cable and OSW development workforce.

New programs can also help support a responsive subsea cable and additional OSW buildout workforce. For example, most existing subsea cable-specific training is offered internationally through short-format courses and micro-credentials. Locally developed micro-credentials in offshore safety, subsea cables, and marine navigation can offer an agile solution to address potential skill gaps.

4. Potential Social Effects

Subsea cable and OSW buildout is associated with both positive and adverse social effects. Effect characteristics and type may vary by phase depending on the linked impact producing factor (e.g., electrification of subsea power cables, presence of infrastructure) and the community in question.

Potential capacity and utilization pressures on services and infrastructure, for example, are expected to increase during peak periods of population in-migration. These pressures will likely be highest during the construction phase, which is projected to require an estimated 6,068 workers, compared to an estimated 881 workers during operations. Other social wellbeing measures may only exist during operations (e.g., disruptions to viewshed as a result of operations and maintenance vehicle movement).

Potential mitigation and enhancement measures are adapted from recently released Regional Assessments of Offshore Wind development for both Nova Scotia and Newfoundland and Labrador and summarized in Table 1-1.

Table 1-1: Potential Social Effects Pathways and Potential Mitigation and Enhancement Measures

Potential Social Effects Pathway	Potential Mitigation and Enhancement Measures
Changes to character of viewshed, increased tourism, decreased tourism	<ul style="list-style-type: none"> → Mitigating potential adverse visual aesthetic effects of OSW buildout may require balancing local interests with renewable energy goals through early engagement and coordinated siting and design. Potential mitigation measures may include coordinating with municipalities and tourism stakeholders to reduce conflicts during peak tourism periods and coastal events; applying a coastal buffer to help reduce potential adverse offshore lighting effects on the onshore visitor experience; and engaging to better understand shoreline locations that are culturally important (Impact Assessment Agency of Canada, 2025b).¹ → Cable installation processes may aim to reduce potential adverse visual aesthetic effects of cable installation and operations (e.g., vessel movement, lighting, sediment plumes). Potential mitigation strategies include scheduling cable installation during low-visibility periods, using directional lighting, applying turbidity controls as needed, and limiting equipment and vessel presence near sensitive areas (Impact Assessment Agency of Canada, 2025a) (WSP, 2025). → Showcasing subsea cable and additional OSW buildout through visitor centres, boat tours, and educational materials can help to enhance the potential positive effect of increased tourism (Impact Assessment Agency of Canada, 2025a).
Changes to community life and wellbeing	<ul style="list-style-type: none"> → Engaging coastal communities early to identify areas that may be affected by offshore lighting, noise, vibrations, or exclusion zones can help to mitigate potential adverse noise and vibration effects (Impact Assessment Agency of Canada, 2025b). → Mitigation measures that can help reduce potential negative effects to sensitive fish species and indirectly mitigate potential decreases in community mental health include: selecting cable routes to avoid sensitive fishing areas and covering subsea cables with scour protection where burial is not possible or where burial could disturb sensitive habitats (Impact Assessment Agency of Canada, 2025b).
Change in crime, substance abuse, and mental health rates	<ul style="list-style-type: none"> → If considering a work camp to support the subsea cable and additional offshore buildout, special consideration may be needed to offset potential adverse effects and build positive community relationships. (Impact Assessment Agency of Canada, 2025b). → In the absence of a dedicated construction worker camp, potential community impacts may be mitigated through coordinated housing strategies, transportation planning, and workforce management protocols developed in collaboration with local authorities.

¹ Note: It is unlikely any one mitigation measure can fully satisfy all viewers unless turbines are placed beyond visible range (Impact Assessment Agency of Canada, 2025b).

Potential Social Effects Pathway	Potential Mitigation and Enhancement Measures
Changes to Indigenous Communities	→ Early engagement and strategic partnerships development with Indigenous Nations can support positive subsea cable and additional OSW buildout effects and help to mitigate adverse effects (Impact Assessment Agency of Canada, 2025b). Accommodation can be mutually beneficial and key to the success of a project.
Changes to capacity and utilization of local services and infrastructure	→ Strategic planning from the province and municipalities to support key infrastructure (including ports and housing) and necessary services can help to mitigate adverse effects related to potential increased demand from OSW-related population growth. These areas fall under government responsibility, but developers and private sector partners can support planning and contribute to infrastructure development through collaboration and investment (Impact Assessment Agency of Canada, 2025b).

2 INTRODUCTION

Nova Scotia offers very attractive resource conditions for offshore wind (OSW) projects with high average wind speeds and consistency, attractive subsea geology, long coastlines and numerous working ports. In addition to its natural resources, the province benefits from an advantageous location to produce OSW power for both domestic and export markets and can consider multiple pathways to address those markets. One of the pathways that is being considered includes an offshore transmission corridor that directly connects Canadian OSW resources with population centres and industrial users on the USA east coast. As envisioned, the transmission corridor would run from Nova Scotia to the northeastern states and carry electricity from OSW projects on both sides of the U.S.-Canadian border.

The objective of this study (the Study) commissioned by Net Zero Atlantic is to develop a comprehensive report that will provide the Government of Nova Scotia with the information necessary to further understand the socioeconomic impacts of a subsea transmission cable connecting OSW developments in Nova Scotia to the northeastern U.S. (the Project).

2.1 GLOSSARY OF TERMS

Glossary of Terms	
BCAD	Billion Canadian Dollars
COD	Commercial Operations Date
CTI&C	Construction, Transportation, Installation, and Commissioning
EPC	Engineering, Procurement, Construction
FEED	Front End Engineering Design
FTE	Full-Time Equivalent
GDP	Gross Domestic Product
GW	Gigawatt
HVAC	High Voltage Alternating Current
HVDC	High-Voltage Direct Current
IMR	Inspection, Maintenance and Repair
LCC	Line Commutated Converter
MCAD	Million Canadian Dollars
MW	Megawatt
NEMOEC	New England Maritimes Offshore Energy Corridor
NSCC	Nova Scotia Community College
O&M	Operations & Maintenance
OEM	Original Equipment Manufacturer
ORECs	Offshore Wind Renewable Energy Certificates

Glossary of Terms	
OSW	Offshore Wind
PLT	Power Line Technicians
POI	Point of Interconnection
ROV	Remotely Operated Vehicle
SCADA	Supervisory Control and Data Acquisition
SCL	Short Circuit Level
SCR	Short Circuit Ratio
VSC	Voltage Source Converter

3 MARKET DEMAND

3.1 OFFSHORE WIND GOALS

Offshore wind is a mature renewable energy technology that can provide direct benefit to Nova Scotia and to export markets. Developing Nova Scotia offshore wind for export could benefit the province through local investment, job creation, and economic growth, and could benefit export markets by providing competitively priced renewable electricity that reduces the cost of achieving clean energy goals. Energy and climate policy in the Northeast United States assumed a major role for offshore wind in achieving decarbonization goals. Offshore wind is the most significant grid-scale renewable energy resource available in the region and features centrally in state and regional clean energy plans. Offshore wind is projected to provide a large share of future energy supply within a diversified portfolio that also includes solar photovoltaic (PV), hydroelectricity, land-based wind, existing nuclear power and energy storage. Of particular value is the high capacity factor of offshore wind in winter months, which is well aligned with rising cold weather demand from electrification of heating and transportation. Offshore wind lease areas in U.S. federal waters are located in relative proximity to major demand centers and can be interconnected to the existing grid predominantly utilizing submarine cables, which can be easier to site than onshore transmission.

Offshore wind has garnered additional support due to the economic benefits associated with establishing a new industry in the United States. Marshalling, construction, installation, operation and maintenance of offshore wind farms and associated transmission infrastructure drives investment and job creation. Establishing a local supply chain to manufacture offshore wind equipment can create additional economic benefit. The U.S. Department of Energy estimated that deploying 30 gigawatts (GW) of offshore wind would support approximately 77,000 jobs in the offshore wind industry and surrounding communities (National Renewable Energy Laboratory, 2022).

Owing to these clean energy and economic benefits, states in the U.S. Northeast have set ambitious offshore wind goals totaling almost 32 GW, as summarized in [Table 3-1](#).

Table 3-1: Offshore Wind Goals for Northeast U.S. States

State	Current Target (MW)
Connecticut	2,300
Maine	3,000
Massachusetts	5,600
New Jersey	11,000
New York	9,000
Rhode Island	1,000
Total	31,900

The Trump Administration's Executive Order suspending offshore wind leasing and reviewing federal leasing and permitting practices for offshore wind has created uncertainty that is slowing the rate of offshore wind deployment in the U.S. This slow-down in U.S. offshore wind development could create an opportunity for Nova Scotia offshore wind to address, in part, the clean energy resource gap created by the delay in U.S. offshore wind development.

3.2 CLEAN ENERGY REQUIREMENTS AND LOAD GROWTH

Offshore wind goals are a component of Northeast states' broader clean electricity goals, which Nova Scotia offshore wind could help achieve. Through legislation and executive orders, Northeast states have established ambitious targets for clean electricity supply.

Table 3-2: Clean Electricity Supply Goals for Northeast U.S. States

State	Clean Electricity Goal	By Year
Connecticut	100%	2040
Maine	100%	2050
Massachusetts	80%	2050
New Jersey	50%	2030
New York	100%	2040
Rhode Island	100%	2033
Vermont	90%	2050

Meeting these goals will require significant quantities of clean electricity as load grows due to electrification of heating and transportation, economic growth, and new demand from data centers and manufacturing. The 2050 Transmission Study developed by New England Grid Operator ISO-New England projects that peak demand could grow by over 200% from 24 GW in 2024 to 57 GW in 2050, and the region could need over 30 GW of offshore wind (ISO New England, 2024a). The New York grid operator NYISO projects that load will increase 90% to over 300 terawatt hours (TWh) by 2050 as a result of building and transportation electrification (Ulmer & New York State Energy Research and Development Authority, 2023).

Supplying increasing demand while meeting decarbonization goals will require a significant acceleration in development of clean electricity supply for the Northeast U.S. Analysis by the Brattle Group found that 3.50 GW to 6.60 GW of renewable capacity, including 2–3 GW of wind, would need to be added *each year* until 2050 to achieve climate goals (Brattle Group, 2019). This represents an 11- to 22-fold increase in the rate of clean electricity deployment in New England. To-date New England states have contracted for 1.53 GW of offshore wind and New York has contracted for 1.88 GW of offshore wind, leaving significant gaps in achieving deployment targets.²

Meeting the increased demand for clean energy will require vast quantities of electricity from renewable energy sources, creating potential demand for Nova Scotia offshore wind. Proposals to export offshore wind (or other clean electricity generation) to U.S. states to meet these states' clean electricity goals could contend with a preference for local clean electricity sources and related economic development. However, there is growing recognition of the value of importing clean electricity as a means of reducing consumer costs and diversifying energy portfolios. This openness to clean electricity imports is evidenced in projects contracted by New York and Massachusetts for large-scale imports of Canadian hydroelectricity and enabling cross-border transmission (further discussed in Section 3.3³)

In addition to helping address clean electricity needs during a slow-down in U.S. offshore wind deployment in the near term, Nova Scotia offshore wind could provide long-term resource diversity benefit to Northeast states. The 2023 white paper describing benefits of a New England – Maritimes Offshore Energy Corridor (NEMOEC) compared wind speeds over the course of a year between a site located near Sable Island with a site located proximate to existing offshore Wind Energy Areas south of New England and found a relatively low correlation (i.e., a period of high wind at one site is not highly correlated with high wind at the

² These figures include the 800 MW Vineyard Wind, 704 MW Revolution Wind, and 30 MW Block Island Wind for New England, and the 810 MW Empire Wind, 924 MW Sunrise Wind, and 134 MW South Fork Wind projects for New York.

³ New York has contracted with Champlain Hudson Power Express for 1,250 MW of hydroelectricity from Hydro Quebec and submarine and underground transmission from Quebec to New York City, and Massachusetts has contracted for 1,090 MW of hydroelectricity from Hydro Quebec and transmission interconnecting to the ISO-NE grid in Maine.

other site) (NEMOEC Coalition, 2023). This wind resource diversity can increase the value of offshore wind developed in both locations in comparison to clustering offshore wind farms in proximate locations where the correlation between wind speeds is greater. The NEMOEC white paper found that the resource diversity benefit of Nova Scotia offshore wind applied equally to sites in the Gulf of Maine where future offshore wind development is planned. In contrast to the resource diversity benefit of Nova Scotia offshore wind there was found to be little wind resource diversity benefit between the Gulf of Maine and areas south of New England.

3.3 DEMAND FOR TRANSMISSION + CLEAN ENERGY PROJECTS

Northeast states have experience procuring large-scale projects combining transmission and clean energy generation and some states have existing authority to procure additional large-scale transmission plus generation projects. Massachusetts in 2019 conducted a procurement for transmission delivering up to 9.45 TWh of clean energy to New England. The procurement – referred to as Section 83D for the legislative provision authorizing the procurement – elicited multiple bids for transmission and clean energy generation from Canada, and resulted in ultimate selection of the New England Clean Energy Connect project delivering hydroelectric generation from Quebec via new transmission through Quebec and Maine (Massachusetts Clean Energy, n.d.). New York in 2021 solicited large scale projects delivering new renewable energy sourced via new transmission and selected two winning projects: the Champlain Hudson Power Express delivering 10.4 TWh of hydroelectricity from Quebec via a 1,250 megawatt, 546 kilometer, transmission line from to New York City, and Clean Path New York, a 1,300 megawatt, 282 kilometer underground transmission line proposed to deliver renewable energy from Upstate New York to New York City (New York State Energy Research and Development Authority, n.d.-c).⁴

⁴ The contract with Clean Path New York has subsequently been cancelled, but the Champlain Hudson Power Express project is projected to come online in 2026.

New England states have additional authority to procure transmission and clean energy generation. The states of Connecticut,⁵ Massachusetts,⁶ and Rhode Island⁷ have legislative authority to procure generation and associated transmission as a means to achieve state energy and climate goals (Connecticut General Assembly, 2023; Massachusetts General Court, 2016, 2024; Rhode Island General Assembly, 2025). These three states could jointly procure transmission plus generation delivered to New England, which would enable procured generation to count for compliance with state renewable energy goals. A joint procurement would build on the three states' collaborative procurement of transmission plus generation in 2015 and joint procurement of offshore wind in 2023 (Rhode Island Office of Energy Resources, 2023).

Developing offshore wind and transmission connecting Nova Scotia to New England would align with regional decarbonization plans. Massachusetts' Clean Energy and Climate Plan (CECP) for 2050 evaluated pathways to achieve the combined energy and climate plans of the New England states and identified the need for up to 36 GW of offshore wind, and 12 GW of transmission capacity between New England and Canada (Commonwealth of Massachusetts, n.d.).

New York has continuing need for clean energy, but at present lacks mechanisms to procure offshore wind and associated transmission from Nova Scotia. Solicitations issued to date for Offshore Wind Renewable Energy Certificates (ORECs) limit eligibility to ORECs produced from offshore wind farms located in U.S. Federal Waters (New York State Energy Research and Development Authority, n.d.-b). At present there are no stated plans to issue a similar solicitation to the 2021 procurement for clean energy generation and transmission that led to selection of Champlain Hudson Power Express and Clean Path New York, though the contract between NYSERDA and Clean Path New York was cancelled in 2024 (New York State Public Service Commission, n.d., p. 22).

⁵ Under Connecticut General Statutes Section 16a-3f, the Connecticut Department of Energy and Environmental Protection (DEEP) may procure renewable energy supply equivalent to up to four percent of the states' load. Additionally, under Section 16a-3n DEP may procure up to 2,000 MW of offshore wind and associated transmission.

⁶ Under the recently enacted Act Promoting a Clean Energy Grid, Advancing Equity, and Protecting Ratepayers, the Massachusetts Department of Energy Resources (DOER) may coordinate with one or more other New England states to procure clean energy and associated transmission (Section 102). Under Section 61 of Chapter 179 DOER is required to procure at least 5,600 MW of offshore wind, but eligibility is limited to offshore wind developed in leases granted for offshore wind development in U.S. Federal waters after 1/1/2012.

⁷ The Affordable Clean Energy Security Act authorizes Rhode Island's electric utility to independently or in conjunction with other New England states procure renewable energy and associated transmission.

3.4 PROJECT DESIGN CRITERIA

Owing to the significant demand for clean electricity and offshore wind, cross-border project experience, and relative proximity to Nova Scotia, New England and New York were considered as potential export markets for Nova Scotia offshore wind in the Northeast U.S. Following consideration of both options the study assumes that the Project will connect Nova Scotia to New England due to 1) the availability of procurement mechanisms in New England, 2) stated interest in cross-border transmission, 3) the shorter distance from Nova Scotia to New England in comparison to New York, and 4) potential conflicts interconnecting submarine transmission to New York.

On September 9, 2024 New England Governors and Eastern Canadian Premiers signed a joint resolution noting in part that “bidirectional transmission across borders and boundaries provides opportunities to increase resilience and reliability and reduce prices for consumers through a larger marketplace for low-cost clean energy generation” and resolving to increase cross border collaboration (Executive Office of the Governor of Massachusetts, 2024). In addition to this evidence of interest in cross-border transmission between New England and Eastern Canada, there would be practical benefits of connecting to New England. Subsea transmission to New England would avoid the cost of hundreds of miles of additional transmission needed to reach New York and would avoid cable routing constraints related to connecting to New York. New York’s Long Island is the closest part of the state to Nova Scotia, but connecting to Long Island would require major upgrades to the onshore grid. Routing past Long Island and interconnecting in New York City would deliver power to a major load center, but cable routing into New York Harbor is severely constrained, and New York is planning to utilize scarce cable access routes to New York City for interconnection of offshore wind from US waters (New York Independent System Operator, 2024).⁸

Within New England, subsea transmission is assumed to connect to the Boston area; the largest demand center in the region where additional transmission could help address projected transmission import needs. ISO-NE’s 2050 Transmission Study found that lack of transmission import capability into the Boston area was one of four high-likelihood concerns anticipated to require additional transmission by 2035 (ISO New England, 2024a). Interconnecting north of Boston (in New Hampshire or Maine) would reduce cabling distance but would require major upgrades to the onshore transmission grid.⁹

⁸ The New York Independent System Operator (NYISO) is currently conducting a procurement for up to 6 HVDC cables to interconnect 4.8 to 8 GW of offshore wind to New York City.

⁹ Under the Longer-Term Transmission Planning (LTTP) process ISO-NE is currently conducting a procurement for transmission upgrades in Maine and New Hampshire to enable development of onshore wind in Northern Maine. Interconnection capacity that may be created by this procurement is anticipated to be fully utilized by new onshore wind.

The offshore wind generation is assumed to come from the Sable Island Bank area, as identified in the Nova Scotia Regional Assessment (Impact Assessment Agency of Canada, 2025b). The Regional Assessment identified five potential “Tier 1” development areas (those with the least number of known constraints) including Sable Island Bank, Middle Bank, Emerald Bank, French Bank, and Sydney Bight. For the purposes of the Study, Sable Island Bank was chosen due to relative proximity to New England and relative cost of offshore wind development as presented in a 2023 study by AEGIR mapping the value of Nova Scotia’s offshore wind resource (Net Zero Atlantic, 2023).

4 PROJECT DESIGN

The focus of this study is on the socioeconomic benefits that could result from developing submarine transmission to enable exporting offshore wind to the Northeast U.S. To support the analysis of the socioeconomic impacts associated with the Project, a conceptual design has been developed. The technical requirements for offshore wind interconnection are beyond the scope of this study and are the subject of additional analysis being conducted through the Atlantic Canada Offshore Wind Grid Integration Study (Net Zero Atlantic, n.d.).

Based on this conceptual design, project costs associated with development, construction, and operations have been developed to inform the socio-economic analysis.

This section provides the following:

- Key assumptions and design parameters for the Project
- Project configuration
- Siting and routing considerations
- Permitting requirements
- Development and construction timeline
- Capital and operating costs

Given that the primary objective of the Study is to assess socio-economic impacts associated with the Project, the objective of the conceptual design is to establish a reasonably likely concept that meets the overall objectives for the Project and the Study. The Study does not include any detailed siting, routing, or system design and the concept presented herein is not intended to represent an optimized or preferred concept, and therefore, should not be construed as a recommended concept.

4.1 DESIGN PARAMETERS

4.1.1 TECHNOLOGY & ASSUMPTIONS

The overall objective of the Project is to connect the following three elements:

- Offshore wind generation near Sable Island
- The Nova Scotia Network
- The New England Network

One of the key decisions for long distance transmission projects is whether to utilize high-voltage alternating current (HVAC) or high-voltage direct current (HVDC) systems. Considering the distances between identified Nova Scotia offshore wind areas and the Northeast U.S. (over 500 km), HVDC transmission technology will result in high capacity, reduced losses, and avoid any requirement for line compensation along the transmission path. The technology selected for the Project is a multiterminal HVDC link using voltage source converter (VSC) technology. The VSC technology is the standard market solution, with some HVDC suppliers no longer offering the traditional line commutated converter (LCC) technology. In the 2010s, LCC technology was seen as a superior choice for long transmission distances due to its lower losses and high current capacity. At that time, VSC technology was more suitable for shorter distances where the benefit from its ancillary services would outweigh the additional losses. Today, advancements in VSC technology have reduced switching losses and increased its current and voltage capacity. It has surpassed LCC technology for most applications and has become the market leading HVDC technology. The standard ratings for multi-terminal HVDC bipole converters are 525 kV DC voltage with a 2 GW DC power rating. The ability to transfer 2 GW of power results in economy of scale and corresponds to the Northeast US RTOs increasing the maximum single-source contingency to 2 GW. Additionally, VSC technology offers ancillary services such as reactive power compensation and black start capability.

In order to increase benefits for Nova Scotia the transmission project is assumed to include interconnection with the Nova Scotia transmission network. Interconnecting to Nova Scotia enables the province to consume any surplus offshore wind power that cannot be exported, for example during periods of low electricity demand in New England, or as a result of outage on the export cable to New England. Additionally, a new interconnection between Nova Scotia and New England can provide benefits to both systems in addition to offshore wind exports, as more thoroughly described in Section 4.2.

4.1.2 SYSTEM CAPACITY

The operational constraints from the Nova Scotia section of the link are considered the limiting factor of the Project and are the focus of this section. Figure 4-1 shows a representation of the Nova Scotia network major transmission substations. There are few 345 kV and 230 kV transmission lines tying the major load centers, the west coast of Nova Scotia, and the New Brunswick system. The generation profile is also varied but composed of mainly smaller generators spread across the island. This brings concerns related to the connection of a 2 GW converter station to the province. Determining injection capabilities across the Nova Scotia system is beyond the scope of this analysis (Net Zero Atlantic, n.d.).¹⁰ Accordingly, a simplifying

¹⁰ Opportunities and challenges for integrating OSW into the Atlantic Canadian grid, both provincially and regionally, is the focus of Net Zero Atlantic's parallel *Atlantic Canada Offshore Wind Grid Integration and Transmission Study*.

assumption is made that less than the full 2 GW capacity of the transmission system is interconnected to the Nova Scotia grid.

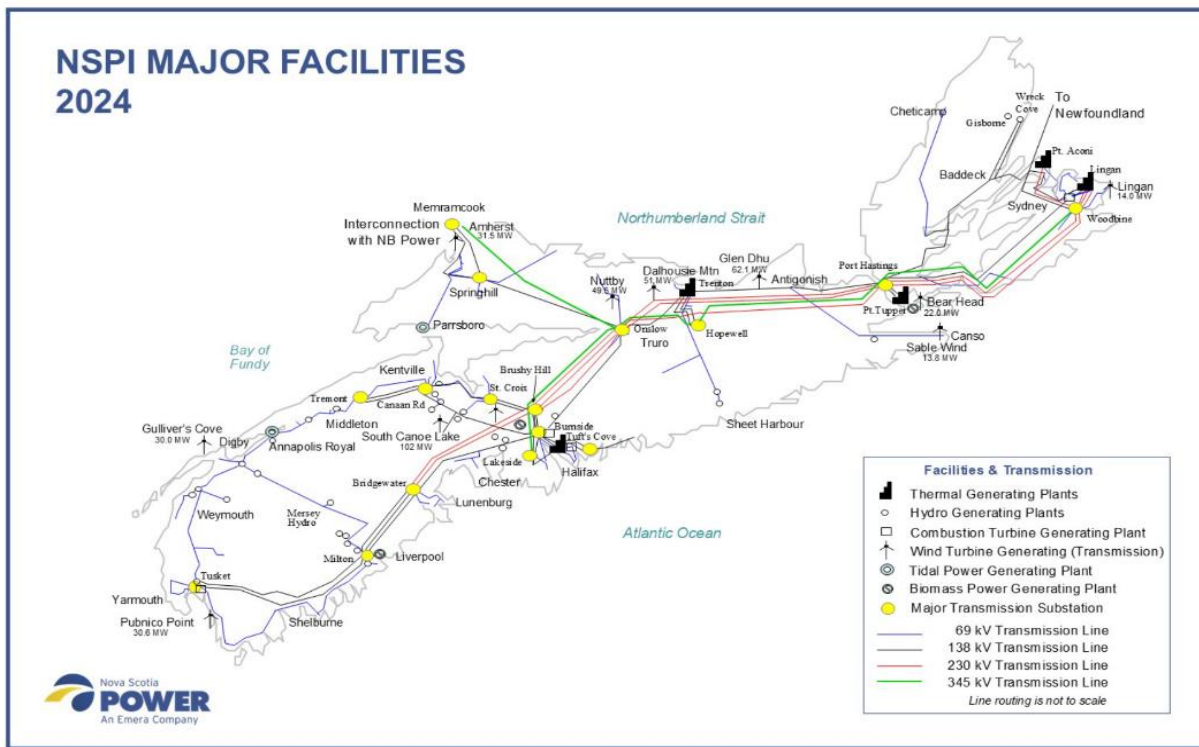


Figure 4-1: Potential Points of Interconnection in Nova Scotia

4.1.3 SHORT CIRCUIT LEVEL

The short circuit level (SCL) is a representation of the strength of a network, based on fault current or the electrical current that flows through a circuit when a fault occurs, such as a short circuit event. VSC-based HVDC links with grid-following (meaning a system that synchronizes its output with the connected grid’s voltage and frequency) requires a short circuit ratio (SCR), of approximately 1.40 or above to operate reliably. The SCR is the ratio of the network SCL at the point of interconnection (POI), with respect to the DC power rating of the HVDC link ($SCL_{MVA}/HVDC_{MW}$). The short circuit level depends on the configuration of the network at any given time, so the design parameter used is the minimum short circuit level, or the worst-case scenario for network strength. Table 4-1 table below presents the minimum short circuit levels that are required for connection of transmission links of different power ratings.

Table 4-1: Short Circuit Levels as a Function of DC Power Rating

DC Power Rating	Short Circuit Ratio	Minimum Short Circuit Level
2000 MW	1.4	2800 MVA
1500 MW	1.4	2100 MVA

DC Power Rating	Short Circuit Ratio	Minimum Short Circuit Level
1000 MW	1.4	1400 MVA
500 MW	1.4	700 MVA

When selecting the POI, the minimum SCL is an important parameter to analyze to ensure the reliable operation of the HVDC link. In cases where the SCL is too low, it is possible to improve the SCL by installing synchronous generators near the POI, or series compensation on some transmission lines.

The following data for potential POIs was obtained using NSPI's minimum generation short circuit models.

- Port Hastings
 - Min SCL: 1288 MVA
 - Voltage: 230 kV
- Onslow
 - Min SCL: 1575 MVA
 - Voltage: 345 kV
- Brushy Hill
 - Min SCL: 1175 MVA
 - Voltage: 230 kV
- Lakeside
 - Min SCL: 1068 MVA
 - Voltage: 345 kV

These levels show that interconnecting even 1000 MW on potential POIs close to a coast would be challenging and would require network upgrades. The Onslow POI shows potential for a 1000 MW connection, and the business case comparing the cost of additional onshore transmission line versus network upgrades for alternative POI would have to be made before selecting the POI. While Onslow is relatively far from the shore and the offshore wind areas (compared to other considered POIs), it is possible that the additional overhead line costs to reach Onslow would be outweighed by the cost savings from avoiding network upgrades and from the reduced losses derived from using HVDC to reach further towards New Brunswick.

4.1.4 MAXIMUM SINGLE-SOURCE CONTINGENCY

Another network constraint is the maximum single-source contingency. The maximum single-source contingency in New England is currently 1200 MW, however, the Northeast US RTOs

(ISO New England, New York ISO, and PJM Interconnection) are evaluating an increase of the single source contingency limit for New England to 2000 MW (ISO New England, New York Independent System Operator, & PJM Interconnection, 2024)¹¹. For the purposes of the Study, it is assumed that the contingency limit in New England will be increased to 2000 MW, and, therefore, the New England single source contingency limit is not a limiting factor in this analysis. In Nova Scotia, the current limit is 237.50 MW. This corresponds to a loss of a pole from the 500 MW Maritime Link HVDC at full import. Accordingly, for this analysis the maximum rating of an HVDC bipole connecting to Nova Scotia is assumed to be 500 MW.

4.1.5 NOVA SCOTIA CONVERTER DC POWER RATING

The maximum single-source contingency and the short circuit level requirement indicate that the DC power rating of the Nova Scotia converter station would be below 2000 MW. 500 MW is a conservative number which satisfies these requirements.

Note that 500 MW is not the economically optimal rating for a bipole station. The duplication and high cost of the equipment is hard to warrant without leveraging the higher current rating of the latest technology to maximize power transfers. To understand if the option is economically viable, careful evaluation of the economics of power transfers, ancillary services such as frequency control, voltage control and islanded mode will be required.

Increasing the rating of the Nova Scotia converter station to 1000 MW or 2000 MW would not necessarily make the HVDC project more cost efficient. This however brings concerns related to the feasibility of the project, as the Nova Scotia network would require upgrades and modifications to allow such a link to be connected. Additionally, the primary intent of the Project configuration is to send the OSW power to New England most of the time. The intent of the connection to Nova Scotia is to increase technical, social and economic benefits to the province and is intended to be used for limited cases. For example, when wind generation is low, when Nova Scotia is in dire need of power, for reactive power support, for frequency control support, for special protection schemes, etc. It is important to perform a cost-benefit analysis for this connection as well as any other potential connection. It is true that the use of available technology would be maximized to generate revenue over its lifetime, but increasing the utilisation of the Nova Scotia connection would take away power transfers from the OSW to New England.

To increase the maximum single-source contingency, the transmission system operator would need to carry more dynamic reserve. This can be done by operating more generating plants at

¹¹ In a letter to the Northeast States Collaborative on Interregional Transmission, the Northeast RTOs stated their intent to assess the feasibility of increasing the single source contingency limit to 2,000 MW.

lower capacity and paying for the reserve. The concern here is that the current reserve would need to be quadrupled (250MW to 1000MW) to enable a standard 2GW bipole HVDC link.

The short circuit level at the POI can be increased in various ways. It is usually done by increasing the amount of thermal generation on the network, although this can conflict with the province's green energy goals. The minimum level is experienced during low demand periods, where the loads do not warrant the active power generation. In this case, synchronous condensers could be used to increase the short circuit ratio.

The upgrade requirements are being analysed in more details a different study through Net Zero Atlantic. As this study's scope is to evaluate potential socio-economic impacts of a project, 500 MW is chosen as a realistic rating which will lead to a conservative evaluation of the socio-economic impacts (as a larger project would present higher economic impacts).

4.1.6 POINT OF INTERCONNECTION

4.1.6.1 NOVA SCOTIA INTERCONNECTION

The interconnection with the Nova Scotia network is an important parameter in the design, it is tied to the rating of the converter station and greatly affects the length and pathways of the HVDC cable or transmission lines, as well as the need for AC network upgrades or modifications.

The 2023 NEMOEC report considered multiple scenarios using Port Hastings as a POI, and in some cases Lakeside. It is noteworthy that the minimum SCL for all these POIs consider an ideal network, with every element in service. When considering N-1 or N-2 contingencies, the SCL would reduce further. In any case, as the DC power rating is limited to 500 MW by the maximum single-source contingency of the network, and any of the POI listed above should satisfy the SCL requirement for a 500 MW HVDC Link.

For the analysis performed in this report, Lakeside is selected as the POI in Nova Scotia. Its location between the OSW location and New England allows the direct connection of the Nova Scotia converter station along the 2 GW segment. This reduces the total subsea cable length requirement and reduces the cost of the project. Having the POI "outside" the OSW-New England segment would require a subsea cable connection between the Nova Scotia converter station and the OSW, effectively creating two separate transmission directions and reducing the efficiency of transfers. Additionally, Lakeside's location close to load centers and proximity to a 345 kV line to New Brunswick would provide flexibility in using the power imports.

4.1.6.2 NEW ENGLAND INTERCONNECTION

Interconnecting subsea transmission to the Boston area would deliver clean power to New England's major load center and provide needed transmission import capability to a zone

projected to face import constraints in the near future (ISO New England, 2024a).¹² ISO-NE has conducted analysis of substations located on or relatively proximate to the coast, and identified three substations in the Boston area that could be utilized to interconnect 2 GW of offshore wind (ISO New England, 2024b):

- Mystic 345kV substation in Everett, Massachusetts
- Ward Hill 345kV substation in Haverhill, Massachusetts
- Tewksbury 345kV substation in Tewksbury, Massachusetts

These substations could alternatively be utilized to interconnect a new subsea cable from Nova Scotia. For the purposes of the Study, rather than select one of these three substations, this analysis assumes that any one of these substations could be utilized to connect to the Boston area.

4.1.7 LOSSES

To accurately evaluate the economic impact of the Project, it is important to understand how much active power can reach the receiving end of the HVDC link. HVDC active power losses are mainly caused by two phenomena: switching losses and resistive losses. Switching losses are estimated at 0.70% at each converter station, and resistive losses depend on conductor selection. Assuming a 2,500 mm² cross-section submarine cable with a resistance of 0.02 Ω/km, and a conductor length of 900 km, the active power transmission losses at each importing station are given in the following table.

Table 4-2 shows the active power as seen at various points on the HVDC link. The difference between AC side power and DC side power is based on converter switching losses. The difference between the active power at the sending end DC side and the receiving end DC side is based on line resistance. In case of equipment failure or maintenance, one pole of the bipole system is taken out of service. This is usually referred to as an N-1 contingency. For HVDC bipole systems they are estimated to happen 4% of the time.

¹² ISO-NE's 2050 Transmission Study finds that load growth would require additional transmission capacity into the Boston area by 2035.

Table 4-2: HVDC System Losses

Configuration	OSW Generation	Received in NE	Received in NS
Bipole Operation	2014 MW AC Side	1869 MW DC Side	0 MW
Maximize NE Imports	2000 MW DC Side	1856 MW AC Side	
Bipole Operation	2014 MW AC Side	972 MW DC Side	467 MW DC Side
Maximize NS Imports	2000 MW DC Side	965 MW AC Side	463 MW AC Side
Monopole Operation	1007 MW AC Side	869 MW DC Side	0 MW
Maximize NE Imports	1000 MW DC Side	863 MW AC Side	
Monopole Operation	1007 MW AC Side	688 MW DC Side	231 MW DC Side
Maximize NE Imports	1000 MW DC Side	683 MW AC Side	229 MW AC Side

The table shows that the maximum active power imports at the POI in New England is 1856 MW. It also shows that this number is reduced to 863 MW for N-1 contingencies. For Nova Scotia, these numbers are 463 MW and 229 MW respectively.

4.2 PROJECT DEVELOPMENT

4.2.1 CONFIGURATIONS

The multi-terminal configurations required by the project need to use the 2 GW rating of the offshore wind terminal and of the New England terminal. Table 4-3 shows potential HVDC configurations, without accounting for line losses.

Table 4-3: HVDC System Configurations

Example	OSW Terminal	NS Terminal	NE Terminal
1	2000 MW Generation	500 MW Import	1500 MW Import
2	2000 MW Generation	0 MW (Out of Service)	2000 MW Import
3	1500 MW Generation	500 MW Export	2000 MW Import
4	0 MW (Out of Service)	500 MW Import	500 MW Export
5	0 MW (Out of Service)	500 MW Export	500 MW Import

4.2.2 SITING AND ROUTING

The HVDC link is composed of three terminals and one multi-terminal switching station.

- Terminal 1 (Offshore Nova Scotia) - 2 GW converter station located within the wind generation area near Sable Island
- Terminal 2 (Onshore Nova Scotia) - 500 MW converter station located near the POI at Lakeside
- Terminal 3 (Onshore New England) - 2 GW converter station located near the POI in the Boston area
- Multi-terminal switching station - DC switching station located west of Halifax

Figure 4-2 shows the conceptual route for the Project. The estimated distances for the subsea cable as shown in Figure 4-2 are approximately 200 km and 650 km for the route from the offshore wind area to Halifax and from Halifax to New England, respectively. Note that these distances are indicative only. Each onshore converter station is expected to occupy approximately 50,000 square meters, and the multi-terminal DC switching station approximately 5,000 square meter.

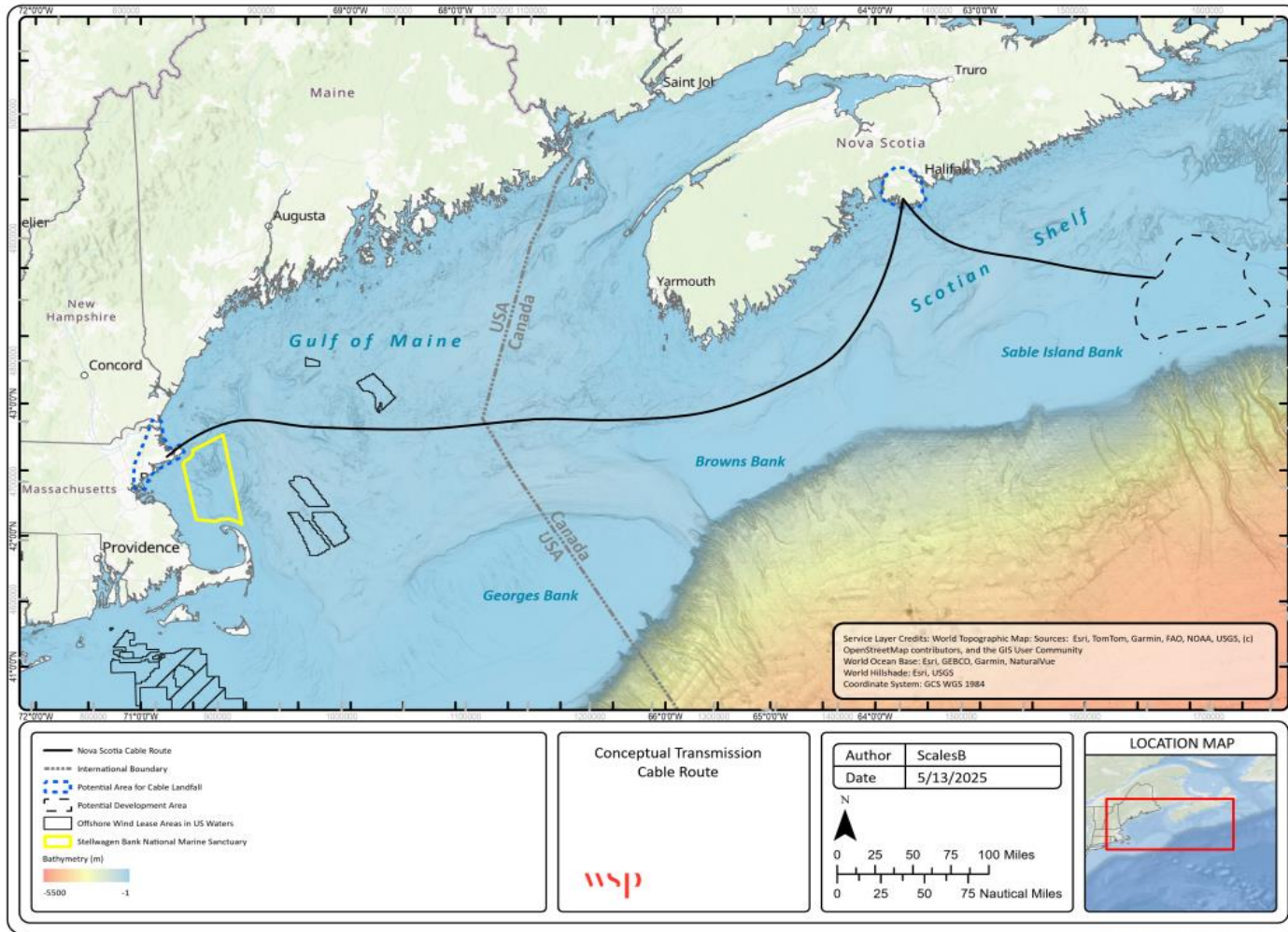


Figure 4-2: Conceptual Project Route

4.2.2.1 ROUTE DESCRIPTION

The route will extend from the Sable Island Bank offshore wind area via a cable that will run to shore near Halifax, and then from Halifax to northern Massachusetts (see Figure 2). The route crosses the Scotian Shelf and the Gulf of Maine. These offshore areas contain numerous basins separated by ridges, swells, knolls, and flat-topped banks that formed during the most recent (Wisconsin) glaciation.

4.2.2.2 ROUTING PRINCIPLES

The primary routing principles are as follows:

- The route shall follow the shortest distance between the offshore wind area and Halifax, and between Halifax and Massachusetts, as feasible.
- The route shall avoid or minimize impacts to potentially affected existing marine resources and uses.
- In accordance with industry standards, the cable might be buried in the seabed to appropriate depths to protect the cable and not interfere with other seafloor uses (primarily bottom fishing and navigation/anchoring).
- In areas where other linear infrastructure exists (telecommunication cables, electric cables, pipelines, outfalls), the cable shall be routed parallel to this infrastructure, where feasible, to minimize fragmentation of marine resources and ocean use areas.

4.2.2.3 ROUTING APPROACH

For a project such as the proposed concept, a detailed and iterative routing process will need to be conducted to identify a preferred route. While this process is beyond the scope of this study, the general approach for the selection of a final route would include the following steps:

- GIS-based Constraints Mapping: Relevant information along a broad corridor for the cable route is assessed by compiling data layers with relevant information. These layers include (but are not limited to) onshore and offshore information related to topography/bathymetry; geology; natural and socio-economic resources and uses, such as wetlands, sensitive habitats, benthic organisms (including lobsters, other shellfish), marine circulation, fishing, military use areas, navigation and obstructions, recreational use (e.g., scuba diving, whale watching), and threatened and endangered species (including whales); cultural resources (such as shipwrecks); and other existing infrastructure (such as telecom cables). Aside from other existing data and information, this step shall integrate applicable information and findings from the Nova Scotia Regional Assessment (2025).

Based on the constraints mapping, a refined preferred route and a limited number of route alternatives/variations are identified for further investigations.

- **Desktop and Selected Field Investigations:** Investigations are conducted as needed to adequately understand existing conditions for the identified relevant resources and uses – to be able to perform impact analyses and identify mitigation approaches, with the objective to avoid or minimize potential impacts. Further, the investigations shall assess constructability for cable installation; this could include geophysical and geotechnical field investigations along the cable route. Other field surveys could include a benthic habitat survey along the cable route and a sediment chemistry survey in route segments closer to shore (i.e., in areas that could contain potential man-made contamination). This step is expected to also include a cable burial risk assessment. Based on these investigations, the route is further refined, and a preferred route is selected.
- **Permit Applications:** Once the preferred route has been selected, this is typically when the applicant starts the process of permitting. However, consultation with regulatory agencies and stakeholders throughout the routing process can help avoid issues during the permitting process.

4.2.3 KEY CONSTRAINTS IDENTIFIED/CONSIDERED

For the purposes of the Study, WSP conducted a high-level review of key constraints along the conceptual route presented in Section 4.2.2. Such constraints are as follows:

- **Fishing:** The Scotian Shelf and the Gulf of Maine contain important fishing areas. Relevant seabed conditions that affect fishing include topography, substrate (rock, sand, mud), and regional circulation patterns (potentially upwelling that is beneficial to plankton growth and hence fish production). Accordingly, the existing seabed in the region is spatially variable creating areas of variable fishing yields for finfish, groundfish, and shellfish. In part for that reason, multiple areas on the shelf between Halifax and Massachusetts are designated as fisheries closure areas for certain species or are otherwise restricted to protect fishing.
- **Biological Resources:** Other areas along the shelf route are restricted as habitat management areas, marine refuges, sanctuaries (such as the Stellwagen Bank National Marine Sanctuary), or conservation areas (such as for cold-water corals). Endangered species in the region include the North Atlantic Right Whale.
- **Navigation and Seafloor Obstructions:** Such areas include areas of denser commercial traffic, where emergency anchoring could pose a risk to the buried cable. It also includes areas with unexploded ordinances and obstructions (e.g., some areas around the Wilkinson Basin in the Gulf of Maine).

- **Other Ocean Uses:** Other ocean uses include whale watches and scuba diving. Such constraints could affect the installation of the cable, although they could be mitigated by installation in the offseason.
- **Constructability:** Constructability pertains to issues related to cable installation. For example, hard substrate (bedrock, densely compacted sediments) could complicate or prevent burial of the cable to a targeted depth. A mobile seabed could result in erosion of the sediment, uncovering the cable, or result in deposition of sediment on top of the cable, causing potential issues with thermal dissipation from the cable. It is noted that the current conceptual route avoids the Northeast Channel (between Browns Bank and Georges Bank) that has strong currents from tidal waters entering the Gulf of Maine.

4.3 PERMITTING

The following sections present the anticipated regulatory requirements for the Project. The regulatory requirements have been identified based on the identified concepts and encompass the following key elements:

- Marine Power Transmission Cable
- Onshore Power Transmission Cable (from Landfall to substation)
- Onshore Substation

Prescribed approval times and WSPs experience with large infrastructure projects were used to develop likely timelines for the overall process. No comparable offshore wind energy projects have yet been developed along the Nova Scotia coast and the regulatory framework for renewable energy projects is still being developed. As a result, estimates on approval times for permits are based on anticipated duration rather than precedent setting past developments.

An indicative schedule for the overall potential permitting timeline leading towards project approval in Canada and the USA is included in Section 3.5. Timelines for the individual permits discussed below are included in the permitting matrix included in Appendix A.

The permitting analysis concludes with a tabular listing of required Provincial, State and Federal permits and authorizations in Canada and the USA, which is included in Appendix A. This comprehensive list includes the following information:

- Permit/Approval;
- Responsible agency & underlying regulation;
- Applicability/Trigger threshold;

- Application submission requirements & information required for approval;
- Agency review & decision-making time;
- Potential dependencies with respect to other permits or conditions.

4.3.1 CANADIAN PERMITTING

4.3.1.1 FEDERAL

The **Canada-Nova Scotia Offshore Energy Regulator (CNSOER)** serves as the primary regulatory authority overseeing and approving offshore energy projects, including subsea cables, ensuring compliance with environmental, safety, and technical standards.

Within the permitting process, the CNSOER ensures that all offshore activities comply with Federal and Provincial regulations, while also assessing and mitigating environmental, social, and economic impacts. Before approving any application for offshore activities, the CNSOER conducts a detailed review of the project, including an assessment of environmental impact studies, safety measures, and contingency plans. Depending on the activity, the CNSOER would conduct a project-specific environmental assessment, or the Impact Assessment Agency of Canada (IAAC) would conduct an impact assessment to support the review under the Accord Acts.

Additionally, the CNSOER coordinates with other relevant Federal and Provincial agencies, such as Environment and Climate Change Canada (ECCC), the Canadian Coast Guard (CCG), Fisheries and Oceans Canada (DFO), and the NS Department of Environment and Climate Change, to ensure that all necessary approvals are obtained. For projects that intersect Federal and Provincial jurisdictions, the CNSOER also facilitates collaboration between authorities to ensure compliance with all applicable regulations.

It is noteworthy that the CNSOER was established in January 2025 through an expansion of the CNSOPB's mandate. Despite being a newly formed entity, the CNSOPB's long-standing experience in regulating offshore fossil fuel activities indicates that structure and processes are likely to remain consistent with previous practices. Therefore, it is expected that collaborating agencies and regulatory bodies will continue to operate according to established protocols, especially in their roles involving the issuance of regulated or legally required permits, despite some inherent complexities of an expanded mandate.

The primary regulators that are expected to play significant roles in the permitting process are listed below.

Canada Energy Regulator (CER)

The CER regulates the export of electricity from Canada. The project proponent may need to engage directly with the CER for specific permits related to the construction and operation of

energy-related components. This includes obtaining necessary authorizations for activities like crossing existing energy infrastructure or engaging in activities that might affect energy pipelines or power transmission systems. For projects involving energy exports to New England, the CER issues export permits and ensures compliance with regulatory requirements, including fair market access and the impact on other provinces.

Environment and Climate Change Canada (ECCC)

ECCC administers acts and regulations related to environmental protection, as per the Canadian Environmental Protection Act, 1999 (CEPA). While the overall coordination is managed by the CNSOER, ECCC ensures that all project activities comply with environmental laws and regulations, addressing concerns related to pollution control and ecosystem protection. ECCC would need to be engaged by the proponent for specific permits and authorizations for activities such as the disposal of materials at sea. ECCC is also responsible for compliance with major federal regulations such as the *Migratory Birds Convention Act* (MBCA).

Impact Assessment Agency of Canada (IAAC)

The IAAC oversees the environmental assessment process for projects that may have significant environmental effects. While the general coordination of the permitting process is led by CNSOER, IAAC plays a key role in evaluating the significance of environmental effects, including the social, cultural, and health impacts, and determining whether further assessment or mitigation is needed.

Canadian Coast Guard (CCG)

The CCG is responsible for marine safety and navigation. For certain aspects of the subsea cable project, the proponent would need to engage directly with CCG to obtain specific authorizations related to marine safety. This includes the review of the Navigation Safety Risk Assessment and Cable Burial Risk Assessment to ensure compliance with regulations and minimize impacts on maritime traffic.

Transport Canada

Transport Canada oversees the transportation aspects of the project, ensuring that the subsea cable installation complies with national transportation regulations and standards. While the CNSOER ensures compliance with broad regulatory frameworks, certain specific authorizations related to marine navigation and safety must be directly obtained by the project proponent through engagement with Transport Canada. This includes assessing potential impacts on navigational routes, ensuring proper signaling of the cable's location, and implementing safety measures to protect maritime traffic. Direct engagement with Transport Canada is crucial to ensure the project aligns with Canada's maritime safety regulations and to mitigate any potential risks to shipping and navigation in the area.

Fisheries and Oceans Canada (DFO)

DFO is responsible for protecting fish habitats, marine mammals, and aquatic species at risk. For specific aspects of the subsea cable project, the proponent would need to engage directly with DFO to obtain permits related to the protection of fish habitats under the Fisheries Act, assess impacts on marine mammals, and ensure compliance with the Species at Risk Act (SARA) for aquatic species. Additionally, if the project affects commercial or recreational fishing activities, the proponent must obtain relevant authorizations to minimize disruptions to these activities.

4.3.1.2 PROVINCIAL – NOVA SCOTIA

As previously stated, the CNSOER would be the primary regulatory authority responsible for the permitting of the subsea cable project, given its federal mandate over offshore energy projects and the Nova Scotia offshore area. However, if the project has environmental or land use implications that require Provincial approval or consultation, the CNSOER may engage different Nova Scotian regulators, like Nova Scotia Environment and Climate Change (NSECC), Nova Scotia Department of Natural Resources (NSDNR) and Nova Scotia Department of Public Works (NSDPW), to ensure compliance with applicable Provincial regulations.

Nova Scotia Environment and Climate Change (NSECC)

NSECC is the Provincial authority responsible for environmental protection, climate policy, and resource management. In the context of the subsea cable project, NSECC may be consulted to assess potential environmental impacts within Nova Scotia's jurisdiction. This could include evaluating effects on coastal ecosystems, water quality, and the alignment of the project with Provincial environmental policies and regulations.

Nova Scotia Department of Natural Resources (NSDNR)

The NSDNR is responsible for managing the province's natural resources, including forestry, minerals, energy and wildlife. In the context of the subsea cable project, NSDNR may be consulted regarding potential interactions with protected areas and sensitive habitats within Nova Scotia's jurisdiction. Its involvement would depend on the specific environmental and land use considerations associated with the project's development.

Nova Scotia Department of Energy (NSDoE)

NSDoE plays a key role in overseeing energy projects in the province and is expected to be consulted by the CNSOER throughout the permitting process. This will ensure alignment with provincial energy policies and objectives, such as the Renewable Electricity Regulations (2005) and the Marine Renewable-energy Act (2015).

Nova Scotia Department of Public Works (NSDPW)

NSDPW oversees Provincial infrastructure, including roads and transportation corridors. While its involvement in the subsea cable project may be limited, its role could become more significant depending on the technology adopted. If the project maximizes overhead lines, requiring extensive terrestrial infrastructure within Nova Scotia, NSDPW would likely be engaged to assess impacts on Provincial land use and transportation networks. Conversely, if the project prioritizes subsea routing, NSDPW's role may be less critical.

4.3.1.3 INDIGENOUS ENGAGEMENT

As part of both Federal and Provincial permitting processes, engagement with Indigenous groups is a key requirement to assess potential impacts on Indigenous rights, lands, and interests. This process involves meaningful engagement to identify and address concerns raised by Indigenous communities, ensuring that traditional knowledge is considered in environmental and regulatory decision-making. Engagement efforts may also include impact assessments related to cultural heritage, resource use, and potential effects on areas of significance to Indigenous Peoples, in alignment with legal and policy frameworks governing Indigenous engagement in Canada.

4.3.2 US PERMITTING

4.3.2.1 FEDERAL

A Presidential Permit from the **U.S. Department of Energy (DOE)** is required for construction and operation of electric transmission lines which cross the U.S. international border. The Federal permitting process for offshore subsea cables assumes that the cable will begin in Canadian waters and cross into Waters of the United States (WOTUS). For the purposes of the Study, it is assumed that the Project cable will make landfall near Boston and connect to the US grid at one of three substations in Massachusetts, as outlined above in Section 3.2.2 (see Figure 4-2). It is assumed there will be no offshore substation within WOTUS.

A request for a Presidential Permit triggers DOE's National Environmental Policy Act (NEPA) review to determine the level of analysis required. In determining whether issuance of a Presidential permit is consistent with the public interest, DOE considers the environmental impacts of the proposed project, determines the project's impact on reliability of the United States electric grid, and weighs any other factors that DOE may consider relevant to the public interest.

A number of additional agencies will cooperate with DOE's NEPA process such as United States Army Corps of Engineers (USACE), United States Coast Guard (USCG), United States Fish and Wildlife Services (USFWS), National Oceanic and Atmospheric Administration (NOAA), Federal Highway Administration (FHWA) and Massachusetts Office of Coastal Zone Management (CZM) to ensure that all necessary approvals are obtained.

United States Army Corps of Engineers (USACE)

USACE would review consultation documentation prepared by the lead agency to ensure compliance with USACE requirements. USACE needs to evaluate and approve aspects of a project and must comply with the requirements of NEPA before issuing permits. USACE would review the Individual Permit (Section 10 and 404) application and request additional information as necessary to make a completeness determination that initiates application to go to public notice. Following publication of a public notice, USACE would simultaneously conduct the public interest review and review of the alternatives analysis under 404(b)(1) guidelines.

United States Coast Guard (USCG)

USCG reviews the Navigation Safety Risk Assessment and Cable Burial Risk Assessment for offshore power cables to assess impacts to anchorage grounds and ensure compliance with regulations for vessels in navigable waters of the U.S. and identify conditions for lighting and marking. The USCG will determine lighting and marking requirements for a particular facility by considering the types, maneuverability, and size of the vessels using the affected waterway; the density of the maritime traffic in the area; prevailing weather (e.g., fog, rain, snow); structural configuration and spacing of the facility; and other factors.

United States Fish and Wildlife Services (USFWS)

USFWS would be consulted by the USACE regarding compliance with the ESA for most listed terrestrial and freshwater species, but also marine mammal species. Endangered Species Act (ESA) Section 7 Consultation is required per ESA Section 7 to determine species that may be present within the project area through the development of a Biological Assessment (BA) for all phases of the project, including construction, operation, maintenance, and decommissioning.

National Oceanic and Atmospheric Administration (NOAA)

NOAA would be consulted by the USACE regarding compliance with the ESA Section 7 and Marine Mammal Protection Act (MMPA) consultation, and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Essential Fish Habitat review. Essential fish habitat (EFH) includes “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

United States Environmental Protection Agency (USEPA)

USEPA would be consulted by the USACE for Clean Water Act (CWA) Section 404 permitting related to wetlands and pollutant discharges during construction and operation.

Federal Highway Administration (FHWA)

FHWA consultation is required when a notice, individual application or request to Massachusetts Department of Transportation (MassDOT) to use or occupy the right of way of a Federal-aid highway is filed. MassDOT is required to submit the matter to FHWA for prior concurrence only in the case of a request for an exception to the MassDOT Utility Accommodation Policy.

Massachusetts Office of Coastal Zone Management (CZM)

The Massachusetts Office of CZM reviews the Federal NEPA process to that federal actions within and outside the coastal zone that have reasonably foreseeable effects on any coastal use or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program.

4.3.2.2 STATE – MASSACHUSETTS

For the purposes of the Study, and as discussed above, it is assumed that the Project cable will make landfall and connect to the US grid in Massachusetts, and this section outlines the applicable permitting requirements in Massachusetts. It is possible that the Project landfall, onshore cable route, and/or connection to the grid could be in another state such as New Hampshire or Maine. State permitting requirements for other states are not specified here, but other states have similar agencies and requirements that may be applicable in the event that the Project enters one of these jurisdictions.

The Massachusetts permitting process for offshore subsea cables begins with the **Massachusetts Energy Facilities Siting Board (MA EFSB)**. Developers must submit a Section 69J Petition for approval to construct, operate, and maintain new transmission export cables from the Clean Energy Resource to an onshore high-voltage direct current (HVDC) converter station, and high-voltage alternating current (HVAC) transmission cables from the converter station to the point-of-interconnection (POI). This petition is required under Massachusetts General Law (M.G.L.) c. 164, §§ 69G and 69J, which governs the construction of new electric transmission lines of 69 kV or more and over one mile in length.

The MA EFSB coordinates with other relevant State agencies, such as the Massachusetts Department of Public Utilities (DPU), Massachusetts Environmental Policy Act (MEPA) Office, Massachusetts Office of Coastal Zone Management (CZM), Massachusetts Department of Environmental Protection (MassDEP), Massachusetts Historical Commission (MHC)/Massachusetts Board of Underwater Archeological Resources (BUAR), Massachusetts Fisheries and Wildlife (MassWildlife) – Natural Heritage & Endangered Species Program (NHESP), Massachusetts Division of Marine Fisheries, Massachusetts Department of Transportation (MDOT), Municipal Conservation Commission and Massachusetts Department of Conservation and Recreation (DCR) to ensure that all necessary approvals are obtained.

Massachusetts Department of Public Utilities (DPU)

Developers need to file with the Department of Public Utilities (DPU) for project approval under M.G.L. c. 164, § 72 (Section 72 Petition) and request zoning exemptions under M.G.L. c. 40A, § 3 (Zoning Petition). The DPU must determine that the project serves the public convenience and interest, and zoning exemptions are necessary for public welfare.

Massachusetts Environmental Policy Act (MEPA) Office

The Project also requires review under the Massachusetts Environmental Policy Act (MEPA), involving the submission of an Environmental Notification Form (ENF) and Draft Environmental Impact Report (DEIR). The MEPA Office issues a Certificate of Secretary of Energy and Environmental Affairs on Final Environmental Impact Report (EIR).

Massachusetts Department of Environmental Protection (MassDEP)

A State Water Quality Certification (WQC) is required under Section 401 of the Federal Clean Water Act, as implemented by Massachusetts regulations. A Chapter 91 Waterways License, as stipulated in Chapter 91 of the Massachusetts Public Waterfront Act, is also required for construction activities within waterways, protecting public interests in tidelands and waterways. Joint WQC/Chapter 91 applications are available but recommended to be submitted separately.

Under the Massachusetts Wetlands Protection Act (M.G.L. c. 131§ 40), municipal Notices of Intent (NOIs) must be filed with local Conservation Commissions for subsea cables traversing local waters or making landfall in wetland resource areas. Copies of NOIs and Orders of Conditions (OOC) must be provided to MassDEP for permitting the Section 401 WQC and Chapter 91 License.

4.3.2.3 LOCAL

Local permits and authorizations such as traffic permits and building permits would be applicable for the onshore cables, converter station, and interconnection facilities. Specifics are dependent upon the specific jurisdictions where such facilities are located, and various permits and approvals may be required.

The primary permit required will be the municipal Notice of Intent (NOI), varying by municipality based on site conditions and environmental impacts during the sea-to-shore transition.

4.3.2.4 NATIVE AMERICAN TRIBAL GROUPS

As part of the State and Federal permitting processes, Native American Tribes are consulted on effects of the Project throughout the NEPA process. Executive Order (EO) 13175 commits Federal agencies to engage in government-to-government consultation with Tribes, while

Secretarial Order No. 3317 requires U.S. Department of the Interior agencies to develop and participate in meaningful consultation with Federally recognized Tribes where a Tribal implication may arise.

4.3.3 CROSS-BORDER PERMITTING CONSIDERATIONS

The Presidential Permit from the Department of Energy (DOE) pursuant to Executive Order (EO) 12038 is required to authorize the construction, connection, operation, and maintenance of facilities for transmission of electric energy at the international border between the United States and Canada. The current uncertainties driven by the priorities of the current Trump Administration may pose challenges for receipt of a Presidential Permit. However, it is worth noting that both the New England Clean Energy Connect and Champlain Hudson Power Express projects both were granted Presidential Permits under the previous Trump Administration. Additionally, projects of this nature typically have timelines that can span multiple administrations on either side of the border and therefore need to consider an approach for long term engagement with applicable stakeholders and regulatory authorities.

Contrasting the uncertainties surrounding the U.S. Presidential Permit process, Canada's regulatory environment for cross-border energy projects is currently shaped by the priorities of the recently re-elected Liberal government, which has demonstrated a commitment to renewable energy expansion and a more stable policy framework. In particular, the CER plays a crucial role in overseeing energy exports, ensuring alignment with national interests, and maintaining regulatory consistency. The CNSOER, established in January 2025 through an expansion of the CNSOPB's mandate, builds on the CNSOPB's 40-year history of regulating offshore petroleum activities. This continuity provides a stable foundation for the CNSOER to develop its regulations and framework for the emerging offshore wind market. While the CER's involvement offers a predictable pathway for energy projects aiming to operate across the Canada-U.S. border, stakeholders must still navigate the evolving regulatory landscape for offshore wind.

4.4 CONSTRUCTION, INSTALLATION AND OPERATION

4.4.1 ONSHORE CONVERTER STATION

Construction will begin once the design is finalized, preferably during the spring. The trailers and site will be set up and organized to support the project's construction. Breaking ground should start with ground-penetrating radar surveys, utility locates, and survey layout. Construction will begin with selective backfill operations.

When the backfill operations are underway, the constructor will begin the construction of site drainage, concrete foundations, duct banks, grounding, trench installations, and utility tie-ins to the existing area utilities. Once backfill is complete, the permanent fence will be installed around the property. The critical path of the job will run through the main building, housing the valve hall and reactor hall. The main building will be the priority for the design packages

and the start of construction work. From the main building, the focus shifts to the service building and miscellaneous buildings. As foundations and backfill are completed, the buildings' structural steel is received.

Structural steel work begins at the main building, followed by the service building and other miscellaneous buildings. The installation of roofing and siding panels will immediately follow structural framing installation. Once the roof is complete and dropped objects do not pose a safety risk to crews within the building, we will start the installation of cable trays, lighting, and support systems within the building. This will allow the constructor to work multiple small crews in multiple locations to maintain the schedule.

As the main building and service building support systems are completed, the constructor will begin the installation of the large equipment under their supervision. The final grounding connections will be made once all the HVDC equipment has been installed. If the project design requires it, the constructor will at this time install the Faraday cage features, such as aluminum flooring, in the reactor hall. Concurrently with the main building and service building equipment installations, the AC yard equipment will be installed. The bus and supports will be installed, followed by the equipment and final jumper connections. Miscellaneous buildings and equipment will be installed as they arrive, including, but not limited to, the cooling tower for valves, diesel generator, auxiliary transformers, oil water separator skid, large transformers, etc. Once equipment is in place and the sub-system testing has been completed, the project team will begin system testing and commissioning. The HVDC supplier and the constructor will closely coordinate this stage. It is scheduled to last for three to four months before energization of the converter station.

4.4.1.1 CIVIL CONSTRUCTION PHASE

Key Civil Work Activities

- Site preparation: Earthworks, grading, drainage, fencing, and access roads
- Foundations: Concrete footings and slabs for valves, transformers, reactors, GIS, cooling systems, and control buildings
- Buildings: Valve halls, control and protection buildings, auxiliary buildings (HVAC, fire suppression, storage)
- Cable trenches and duct banks: For power and control cables
- Grounding systems: Deep earth electrodes, grid mesh, and bonding infrastructure

Typical Personnel Required (Civil Phase)

- Civil engineer

- Construction managers
- Heavy equipment operators
- Formwork/carpentry crews
- Rebar installers and concrete workers
- Surveyors and quality inspectors

Timeline and Crew Size

- Duration: 12–24 months (depending on station size and site complexity)
- Personnel on site (peak): ~100–200 workers during major civil works
- Typical footprint:
 - Land-based station: ~3–10 hectares (7–25 acres)
 - Indoor VSC station: Valve hall and control building may occupy ~5,000–10,000 m²
 - Outdoor yard space: For transformers, reactors, filters – adds ~1–2 hectares

Overall station dimensions: Often 300–500 m × 100–200 m

4.4.1.2 ELECTRICAL AND MECHANICAL INSTALLATION

Major Equipment Installed

- Converter valves (modular multilevel VSCs) inside valve halls
- Power transformers
- AC and DC switchgear (GIS, AIS)
- Smoothing reactors and harmonic filters
- Control and protection systems
- Cooling systems (chillers, pumps, heat exchangers)
- Auxiliary systems: fire protection, battery banks, HVAC, lighting

Key Personnel for Installation

- Electricians and high-voltage technicians (PLT – Power Line Technicians)
- Mechanical engineers and riggers
- Control and commissioning engineers
- HV cable jointers (for DC/AC cable terminations)
- OEM field engineers (equipment-specific installation and testing)

Timeline and Workforce

- Installation Duration: 12–18 months (may overlap with civil)
- On-site workforce (peak): 150–250 people, including subcontractors
- Commissioning duration: 3–6 months

4.4.1.3 OPERATION & MAINTENANCE (O&M)

Each converter station will create employment opportunity in the form of the operation and maintenance team. The team is composed of approximately 20 employees, covering the following functions:

- Asset management
- Engineering
- Maintenance
- Operation
- Safety and environmental overview
- Accounting and finance
- Administrative
- Supervision
- Human resources

Additionally, the requirement for an annual outage will generate temporary employment. Planned maintenance outages typically occur once per year and last for two weeks. 20 to 50 workers are estimated to be needed on site for the following purposes:

- HV equipment testing
- Valve and cooling system maintenance
- GIS breaker inspection and gas handling
- Fire and safety system servicing
- Often includes specialists from OEMs or subcontractors

4.4.1.4 SUMMARY

Table 4-4: Summary of Key Parameters for Onshore Converter Station Construction

Parameter	Typical Range/Value
Construction Duration	24-36 months total (civil + installation + commissioning)
Peak On-site Workforce	150-250 workers
Station Footprint	3-10 hectares (7-25 acres)
Permanent O&M Staff	10-20 full-time (onshore site)
Annual Outage Crew Size	20-50 people (once per year, 1-2 weeks)

4.4.2 OFFSHORE CONVERTER STATION

The offshore HVDC converter station is a major infrastructure asset, combining complex electrical systems with demanding marine engineering. Its construction involves global supply chains and heavy-lift marine logistics, while operations rely heavily on remote monitoring and seasonal maintenance visits. Long-term employment is concentrated onshore, with offshore presence only during commissioning and maintenance campaigns.

The converter station resides on a platform. These are manufactured separately, and can be assembled beforehand, onshore, or on site, offshore. The onshore method, where the platform and the converter building are moved to the final location separately to perform the installation is rarely used for HVDC platforms due to high weather-related risks, greater offshore labor and vessel time, complexity of handling and alignment, and longer commissioning process offshore.

4.4.2.1 FABRICATION & TRANSPORT

Fabrication yards onshore (typically in Europe or Asia) construct the topside and substructure (jacket or monopile). The steel structure (the “topside”) is fabricated in a shipyard or fabrication yard. All HVDC equipment is installed, wired, tested, and pre-commissioned onshore. Most

electrical systems undergo full testing onshore, reducing risk associated with performing such activities offshore.

The fully integrated platform is loaded onto a heavy transport vessel or barge. Transportation of the topside occurs in one piece, with weights that can exceed 20,000 tonnes.

4.4.2.2 INSTALLATION AND COMMISSIONING

A pre-installed jacket foundation (or monopile) is already in place at sea. A heavy-lift vessel or float-over barge lifts and sets the topside onto the foundation. Final hookups (cables, grounding, auxiliary) are completed offshore.

Installation Duration

- Platform installation: 2–4 weeks (weather dependent)
- Cable termination and hook-up: 2–3 months
- Commissioning: 6–9 months including offshore and remote testing

Personnel Required

- Electricians and HV cable jointers
- Power Line Technicians (PLT)
- Mechanical technicians (cooling, ventilation, structural assembly)
- Civil/marine engineers (for platform anchoring and integration)
- Control and SCADA engineers
- Commissioning team from OEM and EPC contractor

Offshore Crew Size and Rotation

- 50–100 personnel on board (split between day/night shifts)
- Crew rotations typically run on a 2–3 week cycle
- Access via: Crew transfer vessels, helicopters, or service operation vessels

4.4.2.3 OPERATION AND MAINTENANCE

The offshore station will create employment opportunity in a similar manner to the onshore stations. Note that offshore stations are note typically continuously occupied due to the high

cost of offshore labour. The primary onshore-based team who covers ongoing operation support, logistics and maintenance is estimated to be between 10 and 20 employees. An annual outage will create a temporary increase in labour as for the onshore stations.

4.4.2.4 SUMMARY

Table 4-5: Summary of Key Parameters for Offshore Converter Station Construction

Parameter	Typical Range/Value
Fabrication Duration	18–24 months (onshore)
Installation Duration (Offshore)	2–4 weeks for topside, 2–3 months total
Commissioning Duration	6–9 months
Offshore Crew Size (peak)	50–100 (rotating teams)
Platform Weight (topside)	3,000–10,000 tonnes
Long-term O&M Employment	10–20 (onshore/offshore mixed)
Annual Outage Crew	20–40 (1–2 weeks per year)

4.4.3 SUBSEA CABLE

The HVDC subsea cables are manufactured in the supplier’s factories. Due to the size of the cable, they can be manufactured in different factories across the world. Once manufactured, the cables are loaded on a heavy-life vessel and transported closer to their destination. Once arrived, they are transferred to a cable laying vessel and ready to be installed. The cable laying vessel is equipped with a rotating turntable and laying machinery that can handle the require tension. Subsea cables use precision laying tools to ensure the cable is positioned as per plan. For shallow waters (less than 500 meters), the cable requires burial to protect it against damage. The presence of the vessels in the water surrounding Nova Scotia has a minimal impact on the province, as the vessels and the crews are largely self-sufficient and equipped for long journeys oversea.

4.5 PROJECT TIMELINE

Planning an international transmission link such as the Project involves a complex array of considerations to ensure the project's success. Key factors include regulatory compliance, which necessitates adherence to international, national, and local laws; environmental and social impact assessments to mitigate negative effects on communities and ecosystems; and technical challenges such as terrain and weather conditions that require robust engineering solutions. Effective stakeholder management and transparent communication are essential

to build trust and support, while risk management strategies and financial planning help address potential issues and budget constraints. Coordination and communication among all parties involved are crucial to maintain project momentum and ensure timely completion. Given these considerations, timelines for such projects can vary considerably. Examples of recent HVDC project timelines are included in the table below for reference.

Table 4-6: Examples of Recent HVDC Project Timelines

Project	Description	Timeline
Champlain Hudson Power Express	1200 MW 546 km Cable Quebec-New York	Start of construction: 2022 Expected COD: May 2026.
New England Clean Energy Connect	1200 MW 233 km Overhead Line Quebec-Maine	Start of construction: 2021 Expected COD: 2025
Maritime Link	500 MW 170 km Cable, 350 km Line Newfoundland – Nova Scotia	Start of construction: 2014 COD: 2018
TransWest Express	3000 MW 1,172 km Overhead Line Wyoming - Utah	Start of construction: 2023 Expected COD: 2029
SunZia	3000 MW 888 km Overhead Line New Mexico - Arizona	Start of construction: 2023 Expected COD: 2026
Viking Link	800 MW 765 km Cable Denmark - UK	Start of construction: 2019 COD: 2023

Project	Description	Timeline
IFA 2	200 MW 204 km Cable France - UK	Start of construction: 2017 COD: 2021

For the purposes of the Study, the following provides a breakdown of the phases for the Project showing key activities associated with the project development and project execution:

1. Project Development

- a. Permitting
- b. Pre-Front End Engineering Design (Pre-FEED)
- c. Preferred Supplier Agreement
- d. Front End Engineering Design (FEED)
- e. Contract & Technical Specifications

2. Contract Award

3. Project Execution (5 years)

- a. Engineering
- b. Procuring/Manufacturing of Equipment
- c. Construction
- d. Installation
- e. Commissioning: Subsystem Tests, System Tests, Power Transmission

4. Substantial Completion

- a. Trial Operation, Targets, Hand-Over
- b. Commercial Operation

5. Operation (30-40 years)

4.6 CAPITAL AND OPERATING COSTS

The cost of procuring and operating an HVDC system comes from multiple elements. In addition to the cost of the major components of the HVDC system, the converter stations and the transmission segments, the capital cost also includes additional costs such as environmental surveys, network studies, conceptual design, third-party engineering services, site preparation, tree clearing, right-of-way establishment, electrode sites, and community engagement.

It is possible to estimate the cost of an HVDC transmission line by using the straight-line distance between the converter stations and a 30% line-length adder (which accounts for added length associated with routing to avoid constraints) and a 2.6 million CAD/km rate¹³. Using this method, the total length of subsea cable is approximately 1,100 km and the cost estimate for the transmission segment of the Project comes to 2,860 million Canadian dollars (MCAD). The converter stations are estimated using recent numbers from the HVDC industry. The site preparation costs vary based on the HVDC owner's internal capabilities, but they can be estimated at 20% of the cost of the equipment.

The following cost estimates are Level 5 and reflect an expected accuracy range of –30% to +50%, based on the AACE Cost Estimate Classification System. The estimates are based on in-house experience and publicly available information for other similar projects.

Table 4-7: Capital Cost Estimate

Element	Cost Estimate
Offshore Converter Station	1,400 MCAD
Onshore Converter Stations	2,030 MCAD
Switching Station	50 MCAD
Subsea Cable	2,860 MCAD
Additional Costs	1,260 MCAD
Total:	7,600 MCAD

¹³ 2024 Midcontinent Independent System Operator (MISO) MISO Transmission Expansion Plan (MTEP) Transmission Cost Estimation Guide.

Historically, converter station construction costs can be roughly estimated around 32% of the total EPC project costs. This leaves the 3,430 MCAD total converter station cost estimate to 2,332 MCAD for engineering and procurement, and 1,098 MCAD for construction.

For operation and maintenance (O&M) cost, 2% of the original capital expenditure can be used. In this case, the total cost would be 152 MCAD yearly to cover operation, maintenance, and other costs such as insurance, salary, regulatory, etc.

In addition to the capital and O&M costs, sustaining capital is required to allow the asset to perform during its 30 to 40 years lifetime. A simple structure of sustaining capital cost estimate is to assume a 15 MCAD investment every 7.50 years to upgrade the station control and data acquisition (SCADA) system, and a 55 MCAD investment every 15 years to upgrade the control and protection system.

4.7 COMMERCIAL RISKS

4.7.1 INTEREST RATES AND INFLATION

Large-scale infrastructure projects require significant up-front capital expenditures, and fluctuations in interest rates and inflation can impact costs significantly. Capital expenditures for equipment and construction are financed through borrowing, with repayment based on anticipated revenue. When the cost of a project increases, revenues must increase to cover higher up-front and borrowing costs.

Interest rates are typically set when a project achieves all necessary approvals and secures supply agreements needed to construct the project. At this point a Final Investment Decision (FID) is made. For renewable energy projects financed on the basis of long-term contracts, pricing for delivered products (i.e., energy and/or capacity) is typically determined in advance of FID. When a complex project requires multiple approvals, the duration between determination of contract pricing and FID can be multiple years. If interest rates increase significantly during this period, the cost of financing the project increases significantly.

Inflation can similarly affect costs. When proposing a project, developers will typically base pricing on indicative bids from suppliers that reflect the anticipated future cost of supplying equipment and labor, which cost is estimated at the time that pricing is proposed. If the anticipated cost of supplying equipment and labor increases between the time when contract pricing is established and FID, the cost of the project can increase.

The adverse impact of increasing interest rates and inflation on large energy infrastructure projects is evidenced in the multiple offshore wind projects that were canceled due to higher-than-anticipated inflation and interest rate increases following the COVID 19 pandemic. Wind farm developers that entered contracts in 2020 and 2021 were subject to significant cost increases due to inflation in the cost of offshore wind components and labor, and due to interest rate hikes implemented in response to inflation. Developers' requests to adjust

contract pricing to account for increased costs were not accepted, leading developers to cancel contracts and accept associated penalties rather than proceed with uneconomic projects.

Risks associated with interest rates and inflation can be addressed in two principal manners. First, expedited permitting and approval can shorten the period between contracting and FID, thus reducing the period of time during which projects are at risk of unanticipated increases in interest rates and inflation. Second, contracts can be structured to enable developers to pass on some or all increased costs by determining a final contract price closer to the time of FID or other project milestones. Such protection against increasing costs can be paired with provisions that reduce contract pricing when interest rates and inflation decrease. This approach has been incorporated in recent offshore wind procurements in the U.S. through the provision of indexing mechanisms that allow contract prices to increase, or decrease based on the cost of certain materials and labor.¹⁴

4.7.2 SUPPLY CHAIN

Constraints on the supply chain for energy infrastructure equipment can increase commercial risks. The global supply chain for transmission equipment is presently constrained due to increasing demand. Major equipment including submarine cabling and HVDC converter stations is manufactured based on individual project specifications, and developers seeking to secure supply must reserve production capacity years in advance of product delivery. Securing production capacity in cable manufacturing facilities and fabrication yards for converter stations requires significant financial deposits that can total tens to hundreds of millions of dollars. Until projects reach FID, these deposits for production slots are at risk. Additionally, demand for specialized equipment such as dedicated submarine cable installation vessels currently exceed available capacity, requiring developers to reserve utilization years in advance of construction. If projects are canceled or significantly delayed, production slots and equipment reservations can be lost and penalties incurred.

Rapid global growth in demand for offshore wind is driving expansion of the supply chain, but until supply and demand are more closely aligned supply chain management will be a challenge for long distance submarine cable projects.

¹⁴ See for example the Indexing Adjustment Mechanism included in Massachusetts' most recent offshore wind solicitation, available at: [Indexing Adjustment Mechanism – Massachusetts Clean Energy](#).

4.8 COMMERCIAL AND PROJECT DEVELOPMENT CONSIDERATIONS

4.8.1 NEED FOR POLICY CLARITY AND CERTAINTY

Clarifying and codifying policy goals related to transmission and offshore wind can help to counterbalance risk and improve the likelihood of developing submarine transmission. Project developers and investors have options for allocating effort and investment, and a clear policy framework can support investment in submarine transmission and Nova Scotia offshore wind. In the case of submarine transmission to enable offshore wind exports, policy clarity in relation to both supply and demand would be beneficial. On the demand side New England states could clarify that offshore wind from Nova Scotia can be used to achieve state goals. On the supply side Nova Scotia's commitment to award licences for up to 5,000 MW of offshore wind in the initial Call for Bids provides important clarity, and this study and other analyses of opportunities for and benefits of offshore wind exports can buttress the case for projects like a submarine cable to New England.

4.8.2 SEQUENCING TRANSMISSION AND GENERATION DEVELOPMENT

Separately developed transmission and generation must be appropriately sequenced to reduce risk of misaligned completion timelines. If transmission is not completed in time to interconnect new offshore wind, wind farm developers are subject to financial losses and increased costs to maintain turbines. If transmission is completed and interconnecting generation is delayed ratepayers are stuck paying for the cost of unutilized or underutilized transmission. Generation developers exposed to this project-on-project risk may incorporate risk premia into their pricing to account for risks beyond their control.

This project-on-project risk can be addressed by establishing an appropriate buffer between completion dates for transmission and generation and by providing financial redress for delays. In European jurisdictions where transmission and offshore wind are developed separately, three-to-six-month buffers have been established between commercial operation dates for transmission and generation, and offshore wind contracts include compensation for losses resulting from transmission delays (New York State Energy Research and Development Authority, n.d.-a).¹⁵

4.8.3 ALIGNMENT WITH BROADER POLICY OBJECTIVES

Demonstrating alignment of Nova Scotia to New England transmission and associated offshore wind development with broader policy objectives will further support the projects

¹⁵ A summary of provisions utilized in Europe to address project-on-project risk is included in the Request for Information associated with the latest procurement of offshore wind by the New York State Energy Research and Development Authority.

rational. Transmission connecting Nova Scotia to New England would provide reliability and economic benefits in addition to facilitating offshore wind export, as described in Section 4.2, and is consistent with the Joint Resolution entered into by New England Governors and Eastern Canadian Premiers in September 2024 recognizing the benefit of interregional transmission.¹⁶ Additionally, as noted in Section 4.1, submarine transmission from Nova Scotia to New England could enable the development of over 2,100 MW of offshore wind in excess of offshore wind capacity that could be developed to meet demand in Nova Scotia and Atlantic Canada. Enabling this additional offshore wind buildout would create a larger pipeline of projects and help to attract offshore wind component manufacturers and other supply chain participants to Nova Scotia, driving additional investment and socioeconomic benefit.

4.8.4 BENEFITS OF FEDERAL SUPPORT

Securing federal support could reduce ratepayer costs and facilitate project approvals. Grants and loans provided by the Canadian or U.S. federal governments would reduce the share of project costs supported by ratepayers and reduce the cost of project financing. The Canada Infrastructure Bank and U.S. Department of Energy have each provided funding for strategic transmission projects (Canada Infrastructure Bank, 2025; United States Department of Energy, n.d.).^{17, 18} The cross-border nature of a subsea transmission system to export Nova Scotia offshore wind to New England would require careful consideration of benefits and costs, which could be informed by the Projects of Mutual Interest framework utilized in Europe to support transmission interconnectors between sovereign nations (European Commission, n.d.).

4.9 LESSONS LEARNED

4.9.1 TECHNICAL RISKS

4.9.1.1 OFFSHORE HVDC TERMINAL RISKS

Several technical risks are associated with the offshore terminal's design, installation, and operation:

1. Environmental Factors:

¹⁶ See footnote 20.

¹⁷ For example, see the Canada Infrastructure Bank's grant of \$217 million to support the Wasoqonatl Reliability Tie reinforcing the connection between Nova Scotia and New Brunswick.

¹⁸ Through the Grid Deployment Office DOE has supported multiple transmission projects.

- a. **Corrosion:** The constant exposure to seawater increases the risk of corrosion on terminal components, including the converter station, cables, and other critical infrastructure. This can lead to component degradation, which, if not addressed, could result in costly repairs or system failure.
- b. **Marine Growth and Biofouling:** Marine organisms such as barnacles, algae, and mollusks may attach to terminal structures and subsea cables, reducing efficiency and requiring regular maintenance to remove such growth.
- c. **Underwater Vibration and Pressure:** Offshore installations are subject to pressure fluctuations, currents, and vibrations, which can damage sensitive equipment or affect the integrity of the electrical connections.

2. Logistical and Installation Risks:

- a. **Remote Location:** Constructing the offshore terminal in a remote location presents significant logistical challenges. The need for specialized vessels and offshore construction technology increases the cost and complexity of the project.
- b. **Severe Weather and Sea Conditions:** Harsh weather conditions, such as high winds, storms, and extreme temperatures, could cause delays or hazards during construction and operation, particularly for marine-based activities like cable laying and terminal assembly.
- c. **Power Conversion and System Reliability:** The power conversion equipment used to convert AC to DC at the offshore terminal must be highly reliable. Faults in the conversion process can cause voltage fluctuations, equipment overheating, and system outages.

4.9.1.2 RISKS ASSOCIATED WITH THE SUBSEA CABLE

The subsea cable is critical to transmitting DC power across the ocean, and it is subject to a variety of risks:

1. Physical Damage:

- a. **Fishing and Anchor Damage:** The subsea cable is vulnerable to damage from fishing trawls, ship anchors, and underwater drilling operations. Protection measures such as cable burial or armoring are required to minimize the risk of mechanical damage.
- b. **Seabed Instability:** Shifting sands, underwater landslides, or earthquakes may displace the subsea cable, leading to stress or failure. A detailed seabed survey is essential to identify and mitigate such risks.

- c. **Temperature and Pressure:** The subsea cable must withstand extreme temperatures and pressures over time. Any failure in insulation could lead to short circuits or loss of power.

2. Electrical Stress:

- a. **Cable Degradation:** Over time, exposure to electrical stress, moisture, and marine conditions could lead to the gradual degradation of cable insulation, resulting in power losses or complete failure.
- b. **Electromagnetic Interference:** The high voltage of the subsea cable may produce electromagnetic fields that could affect the surrounding environment and the proper functioning of the system. Proper shielding and cable design are required to mitigate these effects.

4.9.1.3 RISKS ASSOCIATED WITH THE ONSHORE HVDC TERMINAL INSTALLATION

The installation of the onshore HVDC terminal comes with its own set of risks, particularly related to the integration of the terminal with the regional grid and the installation process:

1. Grid Integration:

- a. **Synchronization:** One of the most critical risks is the proper synchronization of the onshore HVDC terminal with the New England AC grid. Any mismatch in voltage or frequency could lead to grid instability or equipment failure. This requires sophisticated control systems to ensure seamless integration.
- b. **Grid Overload:** The onshore terminal must be capable of handling the large amount of DC power converted into AC and injected into the grid. An overload could lead to system failures or damage to electrical equipment.
- c. **Grid Faults and Protection:** The terminal must include protective systems that can quickly detect and isolate faults in the grid or HVDC transmission. Inadequate protection may cause cascading failures that could disrupt power delivery.
- d. **Minimum Short Circuit Level:** The network in Nova Scotia relies on conventional thermal generation to provide short circuit level. The grid development plan aims at retiring thermal plant in favor of green energy. This might reduce the network strength to a level where operation of an HVDC link would be unstable.
- e. **IBR Interactions:** Inverter-based resource (IBR) use power electronic to convert AC and DC power. The power controls can be affected by the presence of other

IBR's on the network. The presence of the Maritime Link HVDC in Nova Scotia presents the risk of negative control interactions. The behaviors of both systems need to be studied in detail to ensure reliable operation.

2. Construction and Installation Challenges:

- a. **Site Preparation:** The onshore terminal requires significant civil works for its construction, including foundations for heavy equipment, transformer installations, and infrastructure for power conversion. Geological surveys must be conducted to ensure the site can support the terminal structures and protect them from seismic activity or flooding.
 - b. **Logistical Issues:** Constructing the terminal involves complex coordination of heavy machinery, specialized equipment, and a workforce skilled in high-voltage installations. Any delays in construction due to logistical issues or supply chain disruptions could delay the overall project timeline.
 - c. **High-Voltage Equipment Reliability:** The onshore terminal relies on high-power electronics, such as rectifiers, inverters, and transformers, to convert DC power to AC. These components must be designed and maintained to operate at very high voltages under stable conditions. Failure in any part of this system can lead to severe operational risks.
3. **Economic Benefits:** The limitation of the Nova Scotia converter station rating to 500 MW due to network constraints reduces the potential local benefits of the project. Even if the main active power transfers are intended to be from the OSW generation to New England, increasing the rating of the Nova Scotia connection would increase the potential benefits to the province. As of today, this is a minor constraint because 500 MW is in line with the size of the Nova Scotia network, but as it develops it might become a more severe constraint.

ADDITIONAL OFFSHORE WIND BUILDOUT

4.10 OPTIMAL COMBINATION OF OFFSHORE WIND AND TRANSMISSION

Building a submarine cable to New England will enable development of offshore wind in Nova Scotia waters beyond the amount of offshore wind that can be accommodated on the Nova Scotia grid alone. Determining the capacity of offshore wind that can be accommodated by the local grid is beyond the scope of this report, which instead focuses on the *additional* offshore wind that can be enabled by a submarine cable to New England.

The amount of additional offshore wind enabled by the submarine cable is driven by the need to optimize utilization of the new cable and deliver the lowest all-in cost of transmission plus offshore wind generation to offshore wind consumers. This report focuses on determining the lowest all-in cost at the point of delivery, and similar optimization would be required to determine the optimal pairing of generation and transmission for Nova Scotia customers.

The optimal pairing of Nova Scotia offshore wind and subsea transmission to New England is determined by the cost of new transmission and the cost of offshore wind. At the minimum, offshore wind would be developed to match the capacity of the new transmission, in this case 525kV HVDC with 2,000 MW of transmission capacity. Pairing 2,000 MW of offshore wind with 2,000 MW of transmission would ensure that 100% of energy produced by offshore wind farms associated with new transmission can be transmitted to New England. This configuration would limit utilization of the new transmission to the capacity factor of the offshore wind. Alternatively, offshore wind capacity could be built in excess of the capacity of new transmission. Due to the variable output profile of offshore wind, overbuilding generation would allow greater quantities of offshore wind energy to be transmitted when the wind farms are producing at below 100% of their maximum output capability. For example, 2,500 MW of offshore wind operating at 60% output would produce 1,500 MW of offshore wind, 300 MW more than 2,000 MW of offshore wind operating at a 60% output (1,200 MW). Transmitting production associated with this additional 300 MW would spread the cost of transmission over more units of energy, reducing the per-unit cost of transmission. However, 2,500 MW of offshore wind operating at over 80% output¹⁹ (i.e., at over 2,000 MW) would be curtailed. In this analysis limited curtailment is assumed to be acceptable in order to reduce the all-in combined cost of generation and transmission.

Determination of the optimal pairing of offshore wind generation and transmission draws on a number of assumptions to determine the amount of *additional* offshore wind enabled by

¹⁹ These value and output percentages used in this paragraph reflect output at a single moment in time, and should not be confused with capacity factors, which measure average output over a year.

new subsea transmission. The transmission system is assumed to cost 7,600 MCAD and come online in 2035, as described in Section 3. Due to recent volatility in market costs and resulting uncertainty in predicting future costs required to develop Nova Scotia offshore wind, this report assumes a range of potential costs for fixed-bottom Nova Scotia offshore wind in 2035 (fixed bottom offshore wind is assumed to be cheaper than floating offshore wind in 2035). The cost range is based on recent market costs for fixed bottom offshore wind from Ireland, the United Kingdom, and the U.S. Ireland was chosen as an example of a nascent and modestly sized market. The United Kingdom is a mature market that benefits from an established supply chain. New York provides the latest available costs from the United States. Projecting costs for Nova Scotia offshore wind in 2035 based on these recent costs from different markets consisted of:

- 1) Inflating costs from each market from the year costs were announced to 2025 costs.
- 2) Converting costs from host country currencies to Canadian dollars.²⁰
- 3) Costs from New York were adjusted downward to account for the better wind resource off of Nova Scotia in comparison to the wind resource of projects contracted by New York.²¹ It is additionally noted that public policies including the Jones Act requirement to use U.S.-flagged vessels for offshore wind installation and local supply chain commitments increase the cost of OSW in NY relative to what could be achieved in Nova Scotia.
- 4) Costs from U.K. and Ireland were adjusted upward to account for the lack of an established offshore wind supply chain in Nova Scotia.²²

This projection results in a range of potential costs for Nova Scotia from a low of \$6,800/kW (based on costs from Ireland) to a high of \$8,700 (based on costs from New York). The U.K.-based cost projection is \$7,500/kW, and the average of the three is \$7,667/kW of capacity, excluding grid connection. The Ireland-based cost represents an optimistic, best-case scenario that assumes cost reductions by 2035 offset the higher cost of transportation from European

²⁰ Currency conversion rates from March, 2025.

²¹ A data set from the NEMOEC report was used to compare wind speeds from a site in near Sable to a site South of New England (where one of the projects procured by New York – Sunrise Wind – is located). The annual capacity factor for Nova Scotia was determined to be 53% and for Sunrise Wind was determined to be 48%. The estimated difference of LCOEs (9%), based on the difference of capacity factors, was then subtracted from the NY price.

²² This upward adjustment of 15% is based on the 15% higher cost of the first utility scale offshore wind project in the United States (Vineyard Wind) in comparison the price of offshore wind in the immediately preceding offshore wind solicitation in the United Kingdom (UK Round 3 Contract for Difference solicitation).

suppliers to Nova Scotia in comparison to transportation to Ireland. The New York-based cost represents a conservative case that assumes cost pressures on the offshore wind industry continue or increase due to higher commodity prices, cost of debt, and supply chain constraints. These costs reflect recent market pricing that is above projected costs found through prior analyses conducted or based upon assumptions that predated impacts of increased interest rates and supply chain constraints (Net Zero Atlantic, 2023; Nova Scotia Power, 2023).²³ More recent analysis including *Initial Socio-Economic Impact Analysis of Offshore Wind Development in Nova Scotia* developed for the Committee for the Regional Assessment of Offshore Wind Development in Nova Scotia and published in February, 2025 found a range of \$7,000/kW to \$9,981/kW for installed cost of Nova Scotia offshore wind (Impact Assessment Agency of Canada, 2025).

It is important to note that offshore wind costs have increased across global markets. Nova Scotia's world-class wind resource, shallow waters, and established maritime industry are anticipated to make Nova Scotia offshore wind competitive with alternative offshore wind resources in the U.S. Northeast. Most notably, Nova Scotia fixed bottom offshore wind likely compares favorably to floating offshore wind in the Gulf of Maine that is assumed to be developed to achieve New England's decarbonization goals (ISO New England, 2024a). Using the Green Volt project in the U.K. Crown Estate Auction as a proxy, it is estimated that floating offshore wind projects currently cost approximately \$15,800/kW. The water depth at the Green Volt site is 110 to 115 meters, slightly shallower than water depths in the Gulf of Maine Wind Energy Areas, suggesting the floating wind costs in the Gulf of Maine may be higher than this estimate. Based on an assumed \$7,667/kW cost of Nova Scotia offshore wind in 2035, the lowest all-in delivered cost of generation plus transmission would result from developing 2,157 MW of offshore wind (\$7,667/kW) for export over the 2,000 MW transmission system (\$3,800/kW). At \$7,667/kW of installed capacity, 2,157 MW of Nova Scotia offshore wind plus \$7.6 billion for a 2 GW HVDC connection to New England would result in \$24.1 billion of investment. This investment would be financed based on contracts with consumers in the Northeast U.S. to purchase Nova Scotia offshore wind.

Notwithstanding recent price increases, Nova Scotia offshore wind remains competitively priced to provide needed clean energy supply. As noted in Section 3, energy and climate plans in New England assume development of 30+ GW of offshore wind. This exceeds available supply from existing Wind Energy Areas suitable for fixed bottom offshore wind that can supply New England. The favourable cost profile and resource diversity benefit of Nova Scotia offshore wind positions the resource well to meet New England's needs.

²³ The April, 2023 [Value Mapping of Nova Scotia Offshore Wind Resources](#) is based on a 2020 Aegir database and excludes grid upgrade costs. Offshore wind costs cited in Nova Scotia Power's [2022 Evergreen IRP](#) utilized offshore wind pricing based on 2019 projections from the U.S. National Renewable Energy Laboratory.

4.11 ENHANCING BENEFITS OF SUBSEA TRANSMISSION AND OFFSHORE WIND

Subsea transmission connecting Nova Scotia and New England could provide potentially significant benefit in addition to exporting Nova Scotia offshore wind. During periods when the transmission system is not fully utilized to export offshore wind, other clean energy production or system power could be transmitted to New England. Clean energy generation could be utilized to comply with New England states' clean energy requirements and could enable producers of onshore wind, solar and hydroelectricity to sell power at premium pricing. Surplus offshore wind – either offshore wind overbuilt to maximize utilization of the subsea cable or offshore wind developed for the Nova Scotia market – could be substituted for hydroelectricity that would otherwise have been generated to meet demand. This avoided hydroelectric generation could be 'banked' for use during periods of higher demand in Nova Scotia or New England, where it could command premium pricing.

Bi-directional transmission capable of sending power from New England to Nova Scotia during offshore wind lulls would provide additional benefit. Increased import capacity in Nova Scotia would enhance system resilience and reliability. As New England builds out increasing quantities of renewable generation surplus energy that would otherwise be curtailed in New England could be exported to Nova Scotia and potentially banked as hydroelectricity. Different load profiles between Nova Scotia and New England could enable each to help meet the other's peak demand needs, thereby reducing the need for alternative generation or transmission projects that would otherwise be needed in each market. Assessing and quantifying these benefits is beyond the scope of this analysis, but such benefits help support the case for subsea transmission connecting Nova Scotia and New England.

4.12 ALTERNATIVES TO OFFSHORE WIND BUILDOUT

Across Northeast North America there are limited options to deliver emissions-free energy at the scale and with the attributes of Nova Scotia offshore wind. Solar energy will play an important role in meeting clean energy demand, but solar has a far lower capacity factor than offshore wind, particularly in winter months anticipated to see the greatest increase in demand due to electrification of heating and transport. New hydroelectric resources are not available at the up to 40 GW scale envisioned for Nova Scotia offshore wind (Tim Houston, n.d.). Advanced nuclear energy could provide scalable emission-free energy, but deploying new technology and siting projects will require long lead times and significant resources. Ontario recently announced a plan to invest \$20.90 billion in development of four small modular reactors, equating to a capacity cost of \$17,407/kW. In the context of current market dynamics, Nova Scotia offshore wind is a competitive resource to meet future clean energy needs.

To put the \$7,667/kW cost of OSW projects in perspective, it is useful to compare it with the cost of other types of electrical generation like nuclear power or hydroelectricity. In 2021, the muskrat falls hydroelectric project was completed in Newfoundland and Labrador. The 824 MW generating station's final cost is estimated at 13.50 billion, or approximately \$16,000/kW. More recently, the Vogtle Unit 3 and Unit 4 in Georgia began commercial operation. The initial cost estimate for the Muskrat Falls hydroelectric project was approximately \$6.20 billion when the project was first announced in 2010 (Shawn McCarthy, 2010). The two nuclear power plants have a combined generating capacity of 2,234 MW and their final cost is estimated at 30 billion USD, or 41 billion CAD. This results in a generation cost of approximately \$18,000/kW, but note that the original cost estimate was \$8,400/kW and that construction delays, cost overruns and changes in project costs are responsible for the significant cost increase.

5 ECONOMIC IMPACT

Economic impacts can be understood as the effects of an investment or a spending that would create opportunities for entrepreneurs and workers who participate in the implementation of all phases of a project. The design, permitting, construction, and operational phases of an offshore transmission corridor will create job opportunities for both local and non-local residents, and contribute to the GDP of Nova Scotia. For this specific project, WSP worked with Statistics Canada to simulate the provincial input-output model based on the CAPEX and OPEX data.

5.1.1 ECONOMIC IMPACT MODEL INPUTS

The inputs used in the economic impact model are summarized in the following table. For the purpose of this study, the Project expenditures developed by WSP account for all costs related to the construction and operation of the subsea cable transmission line and the offshore wind farms. In sum, \$24.10 billion will be spent during a 5-year construction period, and \$4.71 billion during a 30-year operation period (= \$4.56 billion + \$0.15 billion) that includes major rehabilitation works every 7.50 years.

Table 5-1: Economic Impact Model Inputs

Expense Category	Construction Period (5 years)	Operation Period (30 years)	
	CAPEX (\$M)	OPEX (\$M)	Sustaining CAPEX (\$M)
(1) Subsea Cable Transmission Line			
Construction Costs	2,432		
Engineering & Procurement	5,168		
Total CAPEX	7,600		
O&M Costs/Sustaining Capital		4,560	155
(2) Offshore Wind Investment			
Total CAPEX (Construction Costs + Engineering & Procurement)	16,500		

From the above inputs, WSP worked with Statistics Canada to breakdown each expenditure category into detailed commodity sectors based on Nova Scotia 2021 provincial economic account. For the construction phase, the amount of \$7.60 billion to manufacture the HVDC system and install it under the Atlantic Ocean was broken down into 111 sectors, while the amount of \$16.50 billion to construct the offshore wind farm were broken down into 19 sectors. For the operation phase of the subsea cable transmission line, the \$4.56 amount was distributed across 139 economic sectors to ensure regular operation and maintenance of the

infrastructure, while the \$155.0 million of sustaining capital costs were distributed across 19 sectors.

5.1.2 ECONOMIC IMPACT MODEL OUTPUTS

Once expenditures were distributed across different economic sectors, the input-output (IO) model developed by Statistics Canada simulates the economic impacts of expenditures on a given basket of goods and services or the output of one or several industries. The simulation results from a “shock” to an IO model will show an estimate of the impact on interprovincial and international trade flows. The table below shows estimates of the amount of money that will be spent within Nova Scotia.

For the construction period, Nova Scotia’s entrepreneurs would be awarded 38% of the \$7.60 billion amount for the subsea cable transmission line (\$2.89 billion of contracts), and another 34% of the \$16.50 billion amount for the OSWF (\$5.62 billion of contracts). For the operating period, they will be mainly responsible for regular operation and maintenance works which is why the contract share increases to 74%.

Table 5-2: Expenditures per Location

Construction Period (5 years)				
Location	Subsea Cable		OSWF	
	M\$	%	M\$	%
Within Nova Scotia spending	2,889	38.01%	5,616	34.04%
International imports	2,673	35.17%	6,702	40.62%
Interprovincial imports	2,036	267.79%	4,172	25.28%
Inventories and other commodity leakages	2	0.03%	10	0.06%
Total	7,600	100.00%	16,500	100.00%
Operating Period (30 years)				
Location	OPEX		Sustaining Capital	
	M\$	%	M\$	%
Within Nova Scotia spending	3,372	73.95%	53	34.04%
International imports	476	10.44%	63	40.61%
Interprovincial imports	711	15.59%	39	25.33%
Inventories and other commodity leakages	1.1	0.02%	0	0.02%
Total	4,560	100.00%	155	100%

The IO model results provide three types of economic impacts (direct, indirect and induced impacts) defined as follows:

- Direct impacts - represent the simulated economic effects associated with the direct capital and operational expenditures;
- Indirect impacts - measure the additional simulated economic effects supported due to purchases of goods and services. Indirect impacts are sometimes referred to as supply chain effects;
- Induced impacts - general income effects associated with the spending of salaries and wages earned because of the project's capital and operational requirements on private consumption (e.g., retail, services, transportation, etc.).

Figure 5-1 provides an illustrative overview of the relationship between the different types of impacts. It is generally acknowledged that direct and indirect impacts combined are underestimated since household activity is absent, while the induced impacts are overestimated because of the IO model rigid assumption about shares of consumer spending over income are fixed over time.

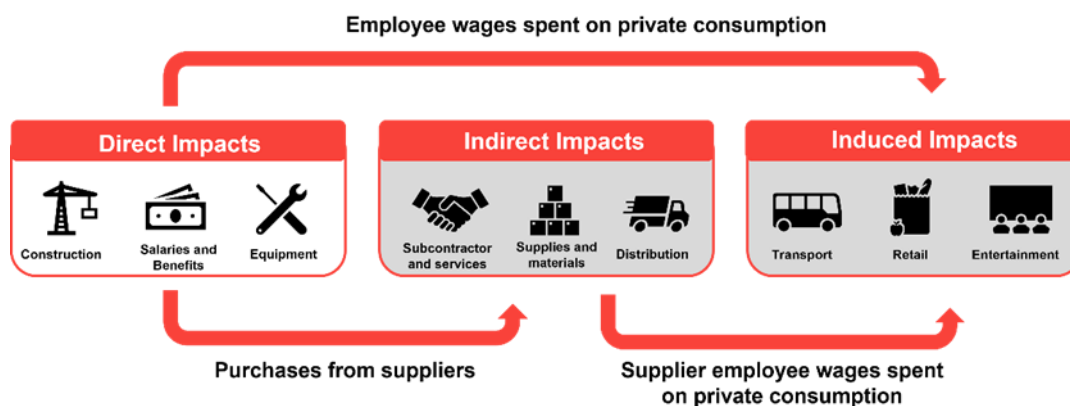


Figure 5-1 - Overview of direct, indirect, and induced economic impacts

For the purpose of this study, impacts on employment and GDP were quantified. Below is the definition of employment and GDP.

- Employment (FTE person-years of employment) – FTE jobs include only employee jobs that are converted to full-time equivalence based on the overall average full-time hours worked in either the business or government sectors. One person-year represents the amount of work that one person could do within a year-long period (assumed to be 2,080 hours). Two jobs lasting 6 months each is equivalent to one job lasting one year each;
- GDP - The total unduplicated value of goods and services produced in the economic territory of a country or region (e.g., Nova Scotia) during a given period.

The economic impact results shown in [Table 5-3](#) and [Table 5-4](#) are based on the specific capital and operating expenditures that are estimated in this report and summarized in [Table 5-1](#) and [5-2](#). It should be noted that direct, indirect and induced impacts to both FTE jobs and GDP have a linear relationship with the capital and operating cost inputs. Therefore variations in the capital and operating costs for both the subsea cable and enabled offshore wind development from what is presented in this report would result in the same proportional changes to the respective economic impacts.

5.1.2.1 CONSTRUCTION PERIOD

The employment and GDP impacts derived from the incremental construction activities are present in [Table 5-3](#). Total provincial employment was estimated to be 13,932 FTE jobs on a yearly basis, during five years. Of this number, 7,896 FTE jobs would be directly created; 3,589 FTE jobs indirectly created; and 2,450 FTE jobs inducingly created.

On average, the construction of the subsea cable and the OSWF would contribute \$2.05 billion in GDP per year to Nova Scotia’s economy. This represents 3.51% of the Province’s GDP, estimated to achieve \$58.40 billion in 2024. This is a significant contribution.

Table 5-3: Summary of Provincial Employment and GDP Impacts, Construction Period

Variable	Annual Impacts			
	Direct	Indirect	Induced	Total
FTE Jobs (persons-years)				
Subsea Cable	2,917	2,084	1,067	6,068
OSWF	4,979	1,502	1,383	7,864
Total	7,896	3,586	2,450	13,932
GDP (M\$)				
Subsea Cable	317	247	165	729
OSWF	930	182	213	1,325
Total	1,247	429	378	2,054

5.1.2.2 OPERATING PERIOD

As soon as electricity production starts, 886 FTE jobs would be created for Nova Scotia workers on a yearly basis. When sustaining capital is injected every 7.50 years to rehabilitate the infrastructure, 12 FTE jobs would be added to arrive at a total of 898 FTE jobs per year. The resulting GDP contribution to the province is estimated to be \$139 million. This represents 0.24% of Nova Scotia’s 2024 GDP.

Table 5-4: Summary of Provincial Employment and GDP Impacts, Operating Period

Variable	Annual Impacts			
	Direct	Indirect	Induced	Total
FTE Jobs (persons-years)				
OPEX	534	160	175	869
Sustaining Capital	8	2	2	12
Total	542	162	177	881
GDP (M\$)				
OPEX	89	21	27	137
Sustaining Capital	1.5	0.3	0.3	2.1
Total	91	21	27	139

5.2 LOCAL SOURCING OPPORTUNITIES

The employment impacts presented in [Tables 5-3 and 5-4](#) represent the number of FTE jobs created within the province of Nova Scotia only. Jobs created elsewhere, although significant, are not reported in this study. Since the number of jobs inductively created by the spending of workers' earned salaries and wages are not directly created by local entrepreneurs selected for the construction and operation of the entire infrastructure, induced employment opportunities are therefore excluded from the local sourcing analysis. Only direct and indirect employment are included.

The construction and operation of the entire infrastructure require a workforce with a diverse range of skills and experiences. This includes but is not limited to those with backgrounds in engineering, equipment operation, labour, project management, finance, geology, etc. As a result, the development of these structures could in turn create opportunities for local entrepreneurs and workers. It could also lead to an inflow of human capital with skill not currently available within the local labour market, thereby benefiting these communities economically.

5.2.1 CONSTRUCTION PERIOD

Direct employment generated from the subsea cable transmission line is estimated to be 2,917 FTE jobs on a yearly basis, during five years of construction period. [Table 5-5](#) presents the breakdown of job opportunities into key economic sectors. Unsurprisingly, local entrepreneurs specialized in electric power engineering construction would directly benefit from the Project. In fact, the number of direct FTE jobs in this sector alone was estimated to be 2,917 from the subsea cable construction. The number of indirect employment, 2,084 FTE jobs, would be distributed across other sectors of the provincial economy.

The OSW investment would even generate more for local entrepreneurs specialized in electric power engineering construction, with 2,999 direct FTE jobs. Local suppliers providing machinery, equipment and supplies would also see great opportunities, mostly with the construction of the OSW farm from which 1,485 FTE jobs are expected to be directly created, and 26 indirectly created. Good opportunities for entrepreneurs in other key sectors include the following:

- Architectural and structural metals manufacturing;
- Building material and supplies merchant wholesalers;
- Architectural, engineering and related services;
- Other electronic product manufacturing.

Table 5-5: Annual Job Creation per Sector, Subsea Cable

Sector	Direct	Indirect	Total
Electric power engineering construction	2,917	0	2,917
Architectural, engineering and related services	0	300	300
Accounting, tax preparation, bookkeeping and payroll services	0	229	229
Building material and supplies merchant wholesalers	0	228	228
Architectural and structural metals manufacturing	0	182	182
Building material and garden equipment and supplies dealers	0	177	177
Truck transportation	0	130	130
Banking and other depository credit intermediation	0	59	59
Water transportation	0	48	48
Other electrical equipment and component manufacturing	0	47	47
Support activities for transportation	0	32	32
Holding companies	0	31	31
Machinery, equipment and supplies merchant wholesalers	0	28	28
Cement and concrete product manufacturing	0	28	28
Others	0	565	565
Total	2,917	2,084	5,001

Table 5-6: Annual Job Creation per Sector, OSW Investment

Sector	Direct	Indirect	Total
Electric power engineering construction	2,999	0	2,999
Machinery, equipment and supplies merchant wholesalers	1,485	26	1,511
Other electronic product manufacturing	197	15	212
Architectural and structural metals manufacturing	0	194	194
Building material and supplies merchant wholesalers	38	121	159
Architectural, engineering and related services	0	158	158
Truck transportation	34	90	124
Accounting, tax preparation, bookkeeping and payroll services	0	118	118
Electronics and appliance stores	77	2	79
Building material and garden equipment and supplies dealers	11	63	74
Banking and other depository credit intermediation	0	40	40
Support activities for transportation	11	28	39
Commercial and service industry machinery manufacturing	33	0	33
Clothing and clothing accessories stores	31	2	33
Cement and concrete product manufacturing	0	30	30
Water transportation	0	26	26
Others	63	589	652
Total	4,979	1,502	6,481

5.2.2 OPERATING PERIOD

For an infrastructure project, the operation is generally assumed by local workers with skill and experience in the “Electric power generation, transmission and distribution” sector. At least 534 FTE new hires from this sector alone are expected to run the infrastructure on a yearly basis (Table 5-7). All the remaining jobs would be indirectly created across different sectors such as “repair construction” and “services to buildings and dwellings”.

When major rehabilitation works are needed, local workers in the “electric power engineering construction” and local suppliers providing “machinery, equipment and supplies” would be primarily recalled to fulfill the requirements (Table 5-8).

Table 5-7: Annual Job Creation per Sector, OPEX

Sector	Direct	Indirect	Total
Electric power generation, transmission and distribution	534	1	535
Repair construction	0	44	44
Services to buildings and dwellings	0	14	14
Banking and other depository credit intermediation	0	10	10
Motor vehicle and parts dealers	0	6	6
Building material and garden equipment and supplies dealers	0	5	5
Truck transportation	0	5	5
Accounting, tax preparation, bookkeeping and payroll services	0	5	5
Architectural, engineering and related services	0	5	5
Machinery, equipment and supplies merchant wholesalers	0	4	4
Food services and drinking places	0	4	4
Insurance carriers	0	4	4
Legal services	0	3	3
Others	0	50	50
Total	534	160	694

Table 5-8: Job Creation per Sector Over 30 Years, Sustaining Capital

Sector	Direct	Indirect	Total
Electric power engineering construction	141	0	141
Machinery, equipment and supplies merchant wholesalers	70	1	71
Other electronic product manufacturing	9	1	10
Architectural and structural metals manufacturing	0	9	9
Building material and supplies merchant wholesalers	2	6	8
Architectural, engineering and related services	0	7	7
Truck transportation	2	4	6
Accounting, tax preparation, bookkeeping and payroll services	0	6	6
Electronics and appliance stores	4	0	4
Others	6	23	29
Total	234	57	291

6 TRADES AND SKILLS REQUIREMENTS

6.1 INTRODUCTION

Major infrastructure projects, including subsea cable and additional OSW buildout, can reshape physical landscapes and drive workforce demands that may affect local and regional labour markets. These projects depend on a broad range of skilled trades and technical expertise. Identifying skill availability and evaluating the capacity of local training institutions can support better alignment between workforce readiness and project requirements. This alignment can benefit communities and help to prevent labour shortages or displacement.

WSP conducted a scoping review of existing publicly available studies to identify the occupations and relevant skills needed for subsea cable and additional OSW buildout throughout construction, transportation, installation, commissioning, operations, and maintenance. Information was included with a focus on trades when available. The review also provides insights into whether Nova Scotia's educational programs can meet these workforce needs.

The findings can inform planning and coordination among project developers, training institutions, and community stakeholders. This report represents a preliminary analysis intended to inform early-stage planning; refinements are expected as project development progresses and additional information becomes available.

6.2 METHOD

To support early planning for subsea cable and additional OSW development in Nova Scotia, WSP conducted a high-level scoping review to assess existing research on workforce readiness and training capacity.

→ **Skills and Workforce Requirements Review:**

- WSP conducted a scoping review of international and Canadian literature to identify the key technical skills required to build and operate offshore wind farms and subsea cable systems. The focus of the review was construction, transportation, installation, and commissioning as well as operations and maintenance. Although some information is included, manufacturing and component supply was not a focus. Sources included government reports, industry publications, and workforce studies from jurisdictions with established offshore wind sectors.
- Limited academic papers and industry reports were identified in the scoping review outlining specific skill gaps for subsea cables. However, international subsea cable training programs reflect established industry standards and technical requirements. WSP reviewed a select number of these programs. This review may help to identify skill

gaps in Nova Scotia by exposing missing competencies, highlighting underrepresented knowledge areas aligned with global practices.

→ **Education and Training Capacity Review:** WSP conducted a review of publicly available studies on Nova Scotia's post-secondary and vocational training programs to assess alignment with identified skill needs.

→ **Key Knowledge Holder Engagement**

○ WSP conducted seven (7) semi-structured interviews with key knowledge holders including:

- Non-profits (e.g., workforce development)
- Academics (e.g., technology and environment programs, assessment experts)
- Industry (e.g., Indigenous-owned businesses, international energy company representatives)

→ These interviews helped identify potential skill and education gaps.

→ **Nova Scotia Municipal Survey:**

○ Net Zero Atlantic and WSP surveyed municipal representatives on their views of a subsea cable and additional OSW buildout in terms of potential socio-economic effects and labour force readiness. Municipal representatives were asked to complete this survey based on their knowledge in their professional capacity with the municipality.

○ The survey was online from June 24th to July 11th, 2025. Twenty-two municipal representatives responded.

○ In terms of demographics:

- 19/22 respondents were from a coastal community and 20/22 were from a rural community
- 19/22 of the municipalities represented in the survey had a population of 1,000-29,000 residents.
- 12/21 respondents reported low – medium population growth (0.50 to 3.50% annually) and 4/21 mild – medium decline (-0.50 to -1.50% annually).²⁴

²⁴ Note: The total number of respondents may vary by question, as not all participants answered every question in the survey.

- In terms of familiarity with planned subsea cable and additional OSW buildout in Nova Scotia, respondents reported a familiarity of 4.7/10 on average with one being completely unfamiliar and 10 being very familiar.

Survey results helped to inform interview findings and secondary research

6.2.1 LIMITATIONS

Limitations for this study include:

- **Data Availability:** Limited public data on offshore wind subsea cable workforce needs specific to Canada; international sources may not fully reflect local conditions.
- **Program Detail:** Publicly available program descriptions may not capture the full scope or depth of training content.
- **Sector Maturity:** Nova Scotia's offshore wind sector is in early stages, which limits the availability of region-specific workforce planning data.
- **Scoping Breadth:** The review was high-level and may not capture niche or emerging skill requirements that would be identified in a detailed labour market study.
- **Limited Key Knowledge Holder Input:** With seven (7) completed interviews, the range of perspectives—especially from underrepresented or marginalized groups—may be incomplete.

6.3 Workforce Readiness

Definition: Workforce readiness refers to the extent to which individuals possess the skills, knowledge, and attributes needed to successfully enter, adapt to, and perform in the workplace. It includes technical competencies, digital literacy, inter-personal skills or soft skills (such as communication and teamwork), and the ability to engage in continuous learning to meet evolving industry demands (Statistics Canada, 2017).

The following sections summarize existing research on key occupations and skills. The focus is on trades and construction roles needed to prepare Nova Scotia's workforce for HVDC subsea cable and offshore wind development between 2025 and 2030. These insights can support the design of targeted training and education programs.

6.3.1 OFFSHORE WIND TRADE OCCUPATIONS

Definition: An occupation is defined as a collection of jobs that are similar enough in work performed to be grouped under a common label for classification purposes. A job encompasses all the tasks carried out by a particular worker to complete their duties (Statistics Canada, 2017).

International research: OSW workforce needs to span beyond subsea cable design and installation to include port development, infrastructure, manufacturing, assembly, and long-term operations. While some roles overlap across phases, each stage requires distinct skills and occupations. For example, electricians, ironworkers, and welders are all required to build and maintain OSW farms (Ross Gould & Eliot Cresswell, 2017) (Workforce Development Institute, 2022).

The following occupation types are needed to support subsea cable and additional OSW buildout. Information on occupations outside of the construction and trades category is included to highlight potential subsea cable-specific occupational needs (Ross Gould & Eliot Cresswell, 2017) (Workforce Development Institute, 2022) :

- **Engineering and Technical Occupations:** Engineering and technical occupations support the technical integrity and performance of offshore infrastructure. Electrical, mechanical, marine, and wind energy engineers, along with technicians such as Computer-Aided Design (CAD) specialists and turbine technicians, are involved in system design, construction, and maintenance. Relevant subsea cable roles and skill needs include:
 - Electrical Engineers: Design, install, and maintain HVDC subsea cable systems critical to offshore wind infrastructure. Key competencies include cable system design, thermal modeling, ampacity analysis, and integration of optical fibre components.
 - Maintenance Engineers: Ensure the long-term reliability of subsea cables through advanced inspection, fault detection, and repair. Skills in Remotely Operated Vehicle (ROV) -based diagnostics, condition monitoring, and failure analysis are essential.
- **Construction and Trade Occupations:** Construction and trade occupations are concentrated in the construction and installation phase. Occupations such as electricians, welders, crane operators, and riggers are essential for physical infrastructure deployment.
- **Leadership and Management Occupations:** Leadership and management roles span multiple phases. Directors, project managers, and site supervisors are responsible for planning, execution, and operational oversight. Their involvement ensures alignment with project goals and regulatory requirements. Relevant subsea cable roles and skill needs include:
 - Project Managers: Lead the full lifecycle of subsea cable projects—from planning and procurement to installation and decommissioning. In-demand skills include project scheduling, stakeholder coordination, budgeting, and regulatory compliance.

- Operations Managers: Oversee the performance and reliability of subsea cable systems in operation. In-demand skills include asset management, performance monitoring, and coordination of maintenance activities to optimize uptime and efficiency.

→ **Maritime and Vessel-Related Occupations:** Maritime and vessel-related occupations are critical across all phases. Captains, deck crew, and divers support offshore logistics, transport, and installation. These roles require marine certifications and experience in offshore environments.

Local Research: The Marine Renewables Canada’s (2025) “Atlantic Canada Wind Energy Supply Chain Assessment: Final Report” (MRC Report)²⁵ notes that workforce needs throughout the lifecycle of an offshore wind farm differ significantly among fixed, floating, and onshore wind. The scale of direct and indirect employment resulting from a wind energy project depends on the extent of local content. This includes tasks performed near the project site, such as manufacturing, construction, marshalling, engagement of local Tier 2 and 3 suppliers, and other regionally executed support work (Marine Renewables Canada, 2025).

Occupations outlined in the (2025) MRC Report include building trade workers, building professionals, maritime trade workers, manufacturing trade workers, STEM professionals, and support staff (Marine Renewables Canada, 2025). Key trade occupations for this report’s focus activities are outlined in [Table 6-1](#).

Table 6-1: Key Trade Occupations for OSW Development

Activities	Key Trades Occupations
Manufacturing and Component Supply	→ Occupations related to ship construction, vessel upgrades, and maintenance and repair services
Construction, Transportation, Installation, and Commissioning	→ These activities rely on journeypersons and apprentices working in both onshore and offshore environments.

²⁵ The MRC Report analyzed existing companies in Atlantic Canada to identify their capacity to support offshore and onshore wind supply chains. It maps regional strengths and gaps, informs proponents about suitable supply chain activities and locations, and highlights opportunities for external investment and partnerships (Marine Renewables Canada, 2025).

Activities	Key Trades Occupations
	<ul style="list-style-type: none"> → Wind turbine technician credentials are often required for installation and commissioning. → Vessel crew and offshore operations personnel are crucial during this phase. → Port operations workers, including logistics managers, stevedores, riggers, and crane operators, are key.
Operations and Maintenance	<ul style="list-style-type: none"> → Typically involves smaller teams of specialized technicians, including workers deployed to the project site (onshore and offshore) for asset inspection, regular and preventative maintenance, repairs, and major component replacements. → Vessel crews are required throughout the project's operational lifetime for offshore inspection, maintenance, and repair work.

Source: (Marine Renewables Canada, 2025).

Interview insights: Occupations mentioned during interviews for cable development and offshore wind expansion in Nova Scotia approximately align with the above identified typical occupations needed for OSW development outlined in Table 6-1 and Table 6-2 outlines detailed occupations and skills mentioned by interviewees.

Table 6-2: Key Occupations and Relevant Skills Mentioned by Interviewees

Functional Area	Occupation
Accounting, Finance, and Procurement	Accounting / Human Resources
Construction and Assembly Workers	Pipefitter
Construction and Assembly Workers	Components Worker
Construction and Assembly Workers	Drone Pilot
Consultants and Researchers	Environmental monitors / Biologist
Consultants and Researchers	Impact Assessment Specialist

Functional Area	Occupation
Consultants and Researchers	Permitting Specialist
Engineers	Civil/Mechanical Engineer
Management and Supervisors	Project Manager
Technicians	Wildlife Technician
Technicians	Wind Turbine Technicians
Technicians	Offshore Wind Installation Technician
Technicians	Remotely Operated Vehicle Pilot
Technicians	Ocean Technician
Trade Workers	Electricians
Trade Workers	Offshore Trenching Technician
Trade Workers	Hydraulics Technician
Trade Workers	Driller
Trade Workers	Mechanic
Trade Workers	Crane Operator
Trade Workers	Assembler
Trade Workers	Logistics Worker
Trade Workers	Heavy Equipment Operator
Trade Workers	Pipefitter
Trade Workers	Blasting Technician
Trade Workers	Welder
Trainers, Teachers, and Professors	Safety Trainers
Vessel and Aircraft Workers	Helicopter Pilot
Vessel and Aircraft Workers	Divers
Vessel and Aircraft Workers	Marine Pilot
Vessel and Aircraft Workers	Captain
Vessel and Aircraft Workers	Barge Operator

Note: the absence of certain roles in the findings does not imply a lack of demand. Rather, it reflects the scope of the interviews, the perspectives of the individuals consulted, and the exploratory nature of the qualitative data collection process.

Source: (WSP Interviewees, 2025)

6.3.2 IN-DEMAND OCCUPATIONS

Definition: In-demand occupations refer to jobs for which employer demand exceeds the current supply of qualified workers. These roles are critical to the growth of key sectors and are often identified through labour market analysis, employer surveys, and workforce planning studies (Statistics Canada, 2017).

Local research²⁶: Nova Scotia faces skilled labour shortages and an aging workforce, despite recent population growth (see Potential Social Effects section). As subsea cable and OSW development expands and a large share of the construction trades workforce retires, existing labour gaps are expected to widen, increasing pressure on the province's workforce capacity (Impact Assessment Agency of Canada, 2025b).

A recent (2025) report from BuildForce Canada indicates that elevated demand is expected across multiple trades and occupations required for OSW development through 2025, with conditions projected to stabilize in the following years (BuildForce Canada, 2025). That said, shortages are projected by 2030 in key skilled trades such as bricklaying, carpentry, crane operation, power line work, roofing, and pipefitting (Turner Drake & Partners Ltd et al., 2023).

According to the (2025) Nova Scotia Report, Nova Scotia's offshore wind sector faces workforce shortages that could limit growth without coordinated planning. The industry requires specialized roles –engineers, technicians, and project managers – with OSW-specific expertise not yet widely available in Canada (Impact Assessment Agency of Canada, 2025b). In addition, the demand for skilled trades labour is acute. The construction and installation phase of a single gigawatt of offshore wind energy requires labour equivalent to 25 to 33% of Nova Scotia's

Offshore Wind Energy Occupation

Spotlight: Wind Turbine Technician
The *Global Wind Workforce Outlook 2024–2028*, published by the Global Wind Energy Council (GWEC), projects that the world will need 532,000 new wind technicians by 2028 to meet global demand for onshore and offshore wind workers. Forty percent of these roles must be filled by new entrants (Global Wind Energy Council, 2024). Wind turbine technicians perform maintenance and repairs on turbines, control systems, and components. They require strong electromechanical skills and must work safely at heights and offshore. Effective communication is essential for coordination with team members and operations staff.

²⁶ International research offers general insights into offshore wind employment, but it does not reflect local labour conditions, infrastructure, or regulatory systems. Workforce needs in Nova Scotia depend on regional training capacity, port readiness, and project-specific design. Global studies often overlook these local factors, making them less effective for identifying in-demand occupations or planning targeted workforce development.

entire non-residential construction workforce. This estimate does not account for additional demand from other major projects in the province (Impact Assessment Agency of Canada, 2025b).

According to the (2025) MRC Report, Atlantic Canada shows strong OSW-related capabilities, especially in offshore installation, vessels, and marine logistics. These strengths stem from Atlantic Canada's marine industries, including offshore oil and gas, shipbuilding, and fisheries. In-demand trade occupations include:

- **Construction, Transportation, Installation, Commissioning:** A strong demand for quayside and marine trades workers to support component handling, assembly, transport, installation, and commissioning. Some Atlantic Canada OSW regions lack marine industry experience, face labour shortages, or have limited workforce capacity. A shortage of purpose-built installation and support vessels has already delayed projects and is expected to worsen as development scales. Global OSW growth will increase demand for construction, transportation, installation, and commissioning services and vessels, straining supply chains (Marine Renewables Canada, 2025).
- **Operations and Maintenance:** Although the Operations and Maintenance (O&M) phase of OSW projects are the longest, it involves fewer concurrent personnel and is primarily service-oriented, aside from major component replacements. As more projects launch, demand for O&M services will grow. These activities require experienced staff for both control room operations and field maintenance. Non-local developer personnel will be present during early stages until local workers are trained. Without a significant increase in Atlantic Canada's OSW deployment, local demand for O&M roles and services will remain limited but long-term (Marine Renewables Canada, 2025).

The MRC Report also flags OSW projects may face delays due to ageing local populations, limitations in existing apprenticeship programs, and provincial constraints in workforce and equipment supply across multiple ongoing projects (Marine Renewables Canada, 2025).

Interview insights: Aligned with existing local research, interviewees expressed concern about labour availability for subsea cable and additional OSW buildout. While some believe the current workforce is sufficient for early-stage activities, others noted gaps in specialized roles, particularly for skilled trades, offshore wind turbine technicians, crane operators. Details from interviewees on trades and trades-adjacent occupations are included below:

- **Trade Workers (12 mentions):** This group received the highest number of mentions for in-demand roles, indicating an urgent need. These roles include electricians, welders, crane operators, construction and assembly workers and other skilled trades essential for construction and installation. Interviewees also noted skilled trades are under pressure due to competing demands from the housing sector.
- **Technicians (9 mentions):** Technicians are also in high demand, particularly for turbine maintenance, electrical systems, and mechanical support. Their role is critical across construction and operations phases.

- **Maritime, Port, and Terminal Professions (3 mentions):** Offshore logistics and marine operations depend on experienced personnel such as divers, deck crew, and port handlers.
- **Vessel and Aircraft Workers (1 mention):** Offshore transport and aerial survey operations require certified pilots and marine crew.

6.3.3 SENIORITY GAPS

Definition: Seniority gaps can be understood as shortages or imbalances in the availability of workers at different levels of experience or responsibility, such as entry-level, mid-level, and senior leadership roles. These gaps may arise when there is insufficient succession planning, limited opportunities for internal advancement, or when experienced professionals retire or leave the sector without adequate replacement (Statistics Canada, 2017).

International research: Existing international studies identify a global shortage of experienced professionals in offshore wind development, particularly in senior technical and management roles. A (2022) report from the U.S. Department of Energy and the National Renewable Energy Laboratory (NREL) indicates that industry growth has exceeded the availability of qualified personnel. Project managers, site supervisors, and senior engineers with offshore-specific expertise remain in limited supply (National Renewable Energy Laboratory, 2022).

Interview insights: These international trends are reflected in Nova Scotia. Key knowledge holders report workforce gaps across all levels of seniority. Interviewees note that employers prioritize hiring local engineers but rely on international professionals with OSW-specific experience to meet project requirements.

Project managers with offshore wind experience are limited. Several organizations lack senior leadership with relevant expertise and report few opportunities for knowledge transfer. Some key knowledge holders identify greater demand at entry and mid-levels, while others emphasize the absence of senior leadership and the need to import expertise to fill these roles.

6.4 KEY SKILLS AND DEMAND

Definition: In-demand skills refer to the specific competencies, knowledge areas, and abilities that are most frequently required by employers across occupations experiencing strong or growing labour market demand (Statistics Canada, 2017).

International research: Offshore wind power operations rely on a workforce with a wide range of skills, generally grouped into three categories: technical, soft, and offshore-specific safety skills, as outlined in Table 6-3. Some are essential throughout all project phases, while others are applied in specific stages. Key areas of expertise include engineering, skilled trades, environmental science, project management, and finance (Ross Gould & Eliot Cresswell, 2017).

Table 6-3: OSW Skills, International Research

Skill Type	Skill
Technical Skills	Carpentry
	Composites/advanced materials
	Data analysis
	Diving
	Energy resource management
	Experience with power plant, renewable energy and electrical grid projects
	Experience with wind power plants, land-based or offshore
	Hydraulics
	Logistics
	Machining
	Proficiency with office productivity software
	Rigging and material handling
	Understanding of electromechanical systems
	Welding
Soft Skills	Ability to lead and motivate staff
	Ability to work independently and in groups
	Analytical thinking
	Comfort working at heights and in open waters
	Commitment
	Continuous quality and process improvement
	Customer service
	Physical stamina
	Strong written, verbal and interpersonal communication
Safety and Offshore-Specific Skills	Advanced Rescue
	Experience with vessel fleet coordination
	Familiarity with offshore safety standards and USCG protocols
	Fire Awareness/Fire fighting
	First Aid
	Marine Safety Training
	Regional Compliance/OSHA 10
	Saturation Diving
	Sea Survival
	Strong understanding of safety and health standards
	Weather prediction/meteorology

Source: (Ross Gould & Eliot Cresswell, 2017)

Local research: The (2025) MRC Report includes a summary of the supply chain elements, including details about skills. Skills for key trades are outline in [Table 6-4](#):. Subsea cable-specific skills for Construction, Transportation, Installation, and Commissioning (CTI&C) and O&M are bolded (Marine Renewables Canada, 2025).

Table 6-4: Key Trades Skills by Project Phase in Atlantic Canada

Phase	Sub-phase	Key Trades Skills
CTI&C	Onshore construction	Road building, grading, leveling, landscaping, foundation preparation for tower, onshore substation, etc.
CTI&C	Offshore installation works	Vertical integration and tow-out of floating OSW turbines, foundation installation, tower mounting, OSW turbine installation, cable installation, cable pull-in
CTI&C	Electrical/grid connection and commissioning	Terminating and connecting electrical infrastructure, energizing systems, commissioning works, calibration, testing, etc.
CTI&C	Vessels and marine logistics	Vessel supply services (Crew Transfer Vessels, Service Operation Vessels, Wind Turbine Installation Vessels, heavy-lift vessels, cable lay vessels , diver boats, pilot/scout boats, barges), Remotely Operated Vehicle operation, diving, helicopter services
O&M	Operations	Facilities management and monitoring
O&M	Offshore inspection, maintenance and repair (IMR)	Wind turbine technician services, rope access technician services, offshore scaffolding, engineering services, regulatory services, Remotely Operated Vehicle services, Automated Underwater Vehicle services, diving, turbine servicing, component replacement support, electrical support, maintenance support

Source: (Marine Renewables Canada, 2025).

Interview insights: Interviewees identified a range of technical, soft, and safety-related skills essential subsea cable and OSW development. Technical skills emphasized include ROV piloting, underwater maintenance, and regulatory compliance, while soft skills such as adaptability and communication are critical for project coordination. Safety-specific competencies like storm training and offshore certifications reflect the operational demands of marine environments. presents a categorized summary of key OSW skills identified in interviews.

Table 6-5: OSW Skills, WSP Interviewee Insights

Skill Type	Skill
Technical Skills	Pipe fitting and alignment
	Drone piloting
	ROV piloting
	Structural assessment
	Construction project management (estimating, contracting, oversight)
	Regulatory compliance
	Materials engineering
	Steel fabrication
	Rope access
	Digital diagnostics and digital skills
	Combination skills (e.g., electrical + mechanical)
	Heavy equipment operation (land and water)
	Indigenous and government land use knowledge
Soft Skills	Problem solving
	Social license awareness
	Adaptability
	Commitment
	Communication and coordination
	Versatility in dynamic environments
	Soft skills for independent and team-based work
Safety and Offshore-Specific Skills	Storm and wind safety training
	Water safety and lifeguarding
	Boat licensing
	Coast guard training
	Safety and regulatory compliance knowledge
	Storm and wind safety training
	Water safety and lifeguarding
	Boat licensing
	Coast guard training
	Turbine construction
	Ship building
	Seabed mapping
	Cable monitoring and guidance
Underwater maintenance	

Skill Type	Skill
	Marine environmental observation
	Modelling and monitoring (waves/wind)
	Water transport
	Oil rig and underwater welding
	Operation and maintenance of wind turbines

Source: (WSP Interviewees, 2025)

Offshore Wind Skills Spotlight: Electricians

Electricians install and connect electrical systems for offshore wind turbines, routing cables through conduit and following marine and safety standards. Line workers install and maintain offshore transmission and distribution infrastructure, including substations, transformers, and power lines linking turbines to the onshore grid.

Key skills include electrical system installation and maintenance, high-voltage cable handling and splicing, reading electrical schematics and technical drawings, rope access, working at heights, use of diagnostic and testing equipment, GWO-certified offshore safety training, marine safety procedures, emergency response, and first aid.

6.4.1 SKILL GAPS

Definition: A skill gap refers to the difference between the skills that employers need for a specific occupation and the skills available in the current workforce. This concept is often used in workforce planning to identify where training, education, or upskilling is required to align labour supply with industry demand (Statistics Canada, 2017).

International research: International research highlights widespread skill gaps in the offshore wind sector. A (2023) report from the United Kingdom Offshore Wind Industry Council stresses that the industry continues to face persistent skills gaps in high-level electrical roles, digital competencies (such as data analysis and engineering), consenting expertise (especially among regulators and statutory bodies), and marine and port operations. Long-term shortages are expected in electrical engineering (notably substations, HV systems, and cables), project management for large-scale developments, advanced digital specializations (including Artificial Intelligence (AI), robotics, and SCADA), logistics for onshore and offshore operations, and construction labor for floating wind projects, particularly in fabrication and welding (Offshore Wind Industry Council, 2023).

Subsea cable insights²⁷: With the growing deployment of underground and submarine power cables, there may be a critical need for specialized skills in the design and engineering of cable systems. As an example, one potential technical gap is in understanding and accurately calculating cable ampacity – the maximum current a cable can carry without exceeding temperature limits (DNV, 2025). While short-term performance may appear adequate, long-term reliability can be compromised by localized thermal bottlenecks.

Current workforce limitations may include insufficient expertise in (DNV, 2025):

- Thermal modeling of cable systems
- Identification and mitigation of ampacity constraints
- Integration of environmental and installation conditions into design parameters

In addition, general engineers and staff new to working with subsea cables may have knowledge gaps in HVDC system technology, cable system design parameters, cable materials, joints and terminations, installation techniques on land and subsea, cable ageing and failure mechanisms, quality assurance and testing procedures, and asset management practices for HVDC power cables in operation (DNV, n.d.).

An indicative list of additional subsea cable-specific skill and knowledge covered in international trainings are outlined in [Table 6-6](#).

Table 6-6: Potential Skill Gaps by International Training Offerings

Gap Type	Specific Skills or Knowledge Areas
Pre-Engineering & Front-End Engineering Design (FEED)	<ul style="list-style-type: none"> → Evolution of subsea cable systems → Transition from hydrocarbon to renewable energy → Market and regulatory drivers → Cable system risk assessment → Route planning and engineering → Cable installation design
Cable System Design	<ul style="list-style-type: none"> → HVDC cable system design parameters → HVDC cable materials → Cable jointing and termination design

²⁷ No academic or industry reports were identified in the scoping review outlining specific skill gaps for offshore wind or oil and gas subsea cables. However, international subsea cable training programs reflect established industry standards and technical requirements. Reviewing these programs may help to identify skill gaps in Nova Scotia by exposing missing competencies, highlighting underrepresented knowledge areas aligned with global practices.

Gap Type	Specific Skills or Knowledge Areas
	<ul style="list-style-type: none"> → Integration of optical fibre components → Cable accessories → Thermal modeling and ampacity calculation → Environmental considerations in design → Design for ageing, reliability, and failure prevention → Current rating (continuous and dynamic) → Thermal aspects → Short-circuit behavior → Magnetic field considerations → Subsea cable technology applications → Cable types and installation procedures
Cable Handling & Installation	<ul style="list-style-type: none"> → Route survey and site preparation → Unexploded Explosive Ordnance (UXO) and wreck management → Cable loading and loadout procedures → Shore-end installation techniques → Subsea cable laying and protection methods → Quality assurance and control during installation → Surface lay procedures and slack control → Use of ROVs for inspection and installation support
Cable Operations & Maintenance	<ul style="list-style-type: none"> → HVDC cable ageing and failure mechanisms → Post-lay burial surveys → Real-time monitoring systems → Fault detection and localization → Diagnosing and managing cable failures → Cable repair techniques → Spare cable storage and logistics → Asset management of HVDC power cables in operation → Inspection and testing protocols → Advanced inspection techniques → Ensuring long-term cable integrity and reliability → Power feed and power safety → Optical transmission principles and testing → DC testing and fault location techniques
Future Trends in Subsea Cables	<ul style="list-style-type: none"> → Applications in wave and tidal energy → Floating wind integration → High-capacity data transmission links → Dynamic cable systems for moving platforms → Emerging technologies and innovations

Source: ("Online Understanding Subsea Power Cables Training Course," n.d.) (DNV, n.d.) (DNV, 2025) (Jee, n.d.) (Offshore Marine People & Academy, n.d.)

Local research: The (2025) Nova Scotia report identifies a significant skills gap for the OSW sector. Key gaps include technical skills and OSW-specific knowledge. While some initiatives exist, broader education, reskilling, and outreach are needed. To address this skill and knowledge gap, the province may need to recruit international specialists and use economic immigration to support curriculum and training development (Impact Assessment Agency of Canada, 2025b).

Interview insights: Key knowledge holders reported consistent skill and knowledge gaps related to OSW across occupations. While many core skills are transferable, most roles require adjustment for marine-specific conditions.

In addition, interviewees noted employers seek workers with cross-disciplinary abilities, including mechanical, electrical, and digital competencies. There is a need for interdisciplinary skill sets that integrate multiple technical domains. Interviewees also noted a need for higher digital skills competency among experienced tradespeople.

Survey insights: Municipal representatives were asked to what extent they agree with the statement: "My community has the skilled labour needed to support a subsea cable and additional buildout of OSW." Most respondents (9/18) selected "neither agree nor disagree," followed by 7/18 agree, 1/18 strongly agree, and 1/18 disagree. No respondents selected "strongly disagree."

The high number of neutral responses may indicate that municipal representatives are uncertain about the availability of skilled labour in their communities or recognize that while some capabilities exist, gaps remain in other areas. Further research is needed to clarify local capacity and inform next steps.

6.4.2 TRANSFERRABLE SKILLS

Definition: Transferable skills are competencies that can be applied across different jobs, sectors, or industries. These include both technical and non-technical abilities such as problem-solving, communication, and practical or job-specific skills (Statistics Canada, 2017). In the context of workforce development, transferable skills are especially relevant when workers shift from one sector to another—such as from offshore oil and gas to offshore wind—where foundational knowledge remains applicable but may require adaptation to new environments or technologies.

International research: OSW workforce can draw on occupations from other industries with similar skill sets and experience levels, making them suitable for transition with limited additional training. For example, Scotland's offshore wind sector benefits from its established offshore oil and gas industry. Existing offshore operations, skilled labour, and infrastructure—such as subsea monitoring—support the transition. While offshore wind requires some unique skills, many are transferable from oil and gas, with others adaptable through targeted training or micro-credentials (Scotland Government, 2020). In 2020, a UK survey by Campaigners Platform, Friends of the Earth Scotland, and Greenpeace UK found that 80% of offshore oil and gas workers wanted to transition out of the sector, and 53% showed interest in offshore wind (Greenpeace UK et al., 2022).

Subsea cable development requires specific transferable skills from sectors like oil and gas, shipbuilding, and marine operations, but it may also demand additional training in HVDC systems, thermal modeling, and subsea installation techniques (“Online Understanding Subsea Power Cables Training Course,” n.d.) (DNV, n.d.) (DNV, 2025) (Jee, n.d.) (Offshore Marine People & Academy, n.d.). While foundational skills exist in related industries, targeted upskilling is likely needed to meet the technical demands of offshore wind infrastructure.

Local research: Nova Scotia has a strong marine workforce with experience in fisheries, naval operations, oil and gas, and onshore wind. These sectors offer a base of transferable labour, but workers require targeted training through upskilling and work-integrated learning (Impact Assessment Agency of Canada, 2025b).

Transferable Skills Spotlight: Subsea Telecommunications Sector

Subsea cable work requires a specialized workforce capable of operating in challenging marine environments. The telecommunications sector has developed strong capabilities in this area, particularly through projects like the Canada TransAtlantic Telephone Cable (CANTAT), which connects Canada to Europe. Professionals in telecommunications cable projects bring skills that are directly applicable to offshore wind HVDC subsea cable work. These include expertise in marine cable installation, route planning, seabed surveying, and fault detection. Both sectors require experience with specialized vessels, ROVs, and a solid understanding of environmental conditions affecting subsea infrastructure (WSP SME, 2025).

The (2025) MRC Report notes that workers from offshore oil and gas, mining, and large-scale civil infrastructure are familiar with the scale, complexity, and conditions of regional offshore environments. Many are accustomed to rotational schedules, strict safety protocols, and remote operations, which supports workforce transition into OSW (Marine Renewables Canada, 2025).

Interview insights: Interviewees identified several sectors with transferable skills relevant to OSW development in Nova Scotia, such as mining, oil and gas, and shipbuilding.

For example:

- Shipbuilding industry: Marine workers may be candidates for workforce transition to the OSW sector, provided that targeted training is implemented.
- Offshore Oil and Gas: Welding skills from offshore oil and gas operations are applicable, though workers will require transition training to meet offshore wind standards.
- Onshore Oil and Gas: Nova Scotia's existing experience with onshore wind and offshore oil and gas provides a foundation of skilled trades. However, workers must be directed toward offshore wind-specific roles. Indeed, platforms used in offshore wind share similarities with those in oil and gas, supporting the transfer of operational knowledge.
- Onshore Wind: Crane operators and other skilled trades supporting onshore wind may also contribute to OSW development.
- Onshore General Construction: Skilled trades supporting onshore construction may have transferrable skills for the OSW sector, though the applicability of some roles to offshore settings remains uncertain.

Interviewees also noted that labour shortages in transition industries can limit the ability to move workers with relevant skills into offshore wind roles.

6.5 *EDUCATION AND TRAINING PROGRAMS*

Post-secondary institutions play a critical role in preparing the workforce for offshore wind development. Targeted education and training programs are needed to align technical skills with industry requirements, support career transitions, and build capacity in key areas such as marine operations, electrical systems, digital technologies, and project management. Strengthening these pathways will help support a steady supply of qualified workers across all occupational levels.

6.5.1 EDUCATION AND TRAINING NEEDS BY TYPE OF QUALIFICATION

Definition: Education and training refer to the formal and informal learning pathways required to enter and perform in an occupation. This includes academic qualifications (such as high school diplomas, college diplomas, and university degrees), vocational and technical training (such as apprenticeships and certifications), and on-the-job experience (Statistics Canada, 2017).

International research: Offshore wind roles vary in their training needs depending on the level of technical specialization. Project management and support roles often rely on transferable skills from other sectors and may not require additional training. Trade roles, however, typically require technical certifications in welding, mechanical and electrical maintenance, inspection, material testing, and quality control. Assemblers bring relevant experience in mechanical and electrical assembly, surface preparation, composite fabrication, and component installation, as outlined in studies from both the U.S. and Europe (Scotland Government, 2020) (Ross Gould & Eliot Cresswell, 2017).

More advanced roles—such as turbine and substation foundation production—require skilled trades training. This may include safety and first aid certification, offshore wind systems education, and technical instruction in electrical, hydraulic, and mechanical systems (Scotland Government, 2020) (Ross Gould & Eliot Cresswell, 2017).

Subsea cable insight: Most available training and educational programs specific to subsea cables are delivered internationally and structured as micro-credentials or short-format courses. Notable providers include Det Norske Veritas (DNV), which offers a three-day Submarine Power Cable Training Course focused on technical and operational aspects (DNV, n.d.); Telefocal, which delivers the Certified Submarine Cable System Expert (TC-SCSE) program covering engineering and commercial components (Telefocal, 2025); and Global Marine, which provides hands-on training in cable jointing and repair through its accredited training school in the United Kingdom (Global Marine, n.d.).

Micro-credentials: refer to short, focused training programs designed to build specific skills aligned with industry needs. In the context of offshore wind, they offer a flexible and responsive way to upskill workers without requiring full diploma or degree programs. These credentials can be delivered alongside existing programs or as standalone modules, making them suitable for rapid workforce development.

Interview insights: Key knowledge holders emphasized micro-credentials as a practical solution to address immediate training gaps while full-scale programs are developed. Examples of possible micro-credentials raised by interviewees include modules in offshore safety, marine navigation, ROV operation, underwater welding, and hydrogen systems. Institutions like Nova Scotia Community College (NSCC) and others across Canada are exploring micro-credentialing to support emerging sectors, including offshore wind and green hydrogen.

6.5.2 KEY PROGRAMS AND EDUCATIONAL INSTITUTIONS IN NOVA SCOTIA

Definition: Key programs and educational institutions are defined as structured educational offerings and the organizations that deliver them, which play a critical role in equipping individuals with the skills and qualifications required by the labour market. These include postsecondary programs, trades training, micro-credentials, and other specialized training initiatives that are directly aligned with current and emerging workforce demands.

Local research: According to the (2025) MRC Report, training and educational institutions in Atlantic Canada offer onshore wind programs, certifications, and apprenticeships across the project lifecycle. These institutions are prepared to expand offerings to support offshore wind. They recognize labour shortages as a risk and plan to collaborate with industry proponents to address workforce needs, as they have during past industry transitions (Marine Renewables Canada, 2025).

In Nova Scotia, ocean and wind energy research centres, along with institutions such as NSCC and Dalhousie University, shape the province's workforce for OSW:

- **Universities and Research Centres:** Nova Scotia is home to several leading ocean science institutions, including the Bedford Institute of Oceanography, the Institute for Marine Biosciences, the Navy's Defense Research and Development Canada laboratory, the Ocean Frontier Institute, and the Centre for Ocean Ventures and Entrepreneurship. These research centres, along with Dalhousie University, have produced 450 PhD-level ocean scientists, the highest concentration in the world, positioning Nova Scotia as a hub for oceanographic expertise (Bruce Johnson, 2012).
- **Colleges and Industry Training:** Nova Scotia is home to several leading trades and technical institutions, including NSCC and other specialized training centres. These colleges, in collaboration with industry partners, support the development of a skilled workforce in marine, electrical, and wind energy trades (Impact Assessment Agency of Canada, 2025b).

NSCC has a strong record of developing training programs in partnership with industry, including its role in preparing the workforce for offshore oil and gas development in Nova Scotia and Newfoundland and Labrador. Indeed, NSCC's Workforce Development division collaborates with offshore operators to design and deliver training in areas such as offshore

Project Timelines and New Training

Development: Uncertainty around project timelines, capacities, locations, and offtake pathways can create challenges for training institutions, which must align worker readiness with project schedules. This is especially relevant in early OSW development, given the long lead times. To define workforce requirements for offshore and onshore wind, regular coordination among training entities is essential. Adequate support structures must be in place to meet evolving industry needs (Marine Renewables Canada, 2025)..

safety, technical operations, and industrial trades. Instruction is provided by industry-experienced professionals and may be delivered on-site or at NSCC facilities to align with employer needs (NSCC, n.d.).

Subsea cable insight: Training specific to subsea cables is limited in Canada and Nova Scotia. No programs identified in the scoping review or in interviews have an explicit focus on subsea cables. This gap in domestic training highlights the need for regional capacity-building or partnerships with international providers.

Interview insights: Table 6-7 provides an indicative list of the primary education and training programs in Nova Scotia that support workforce development for the offshore wind sector. These programs provide foundational and specialized skills in areas such as turbine technology, marine operations, engineering, and environmental sciences.

Table 6-7: Offshore Wind Key Education Programs, 2025

Program	Institution(s)	Programs	Key Skills Developed
Wind Turbine Technology	Nova Scotia Community College	Wind Turbine Technician (launching Fall 2026)	Turbine installation, maintenance, electrical and mechanical systems
Marine Engineering & Navigation	Nova Scotia Community College	Marine Engineering, Small Vessel Operators, Bridgewatch	Vessel operations, propulsion systems, maritime safety
Ocean Technology	Nova Scotia Community College	Ocean Tech Program (limited capacity)	Marine instrumentation, robotics, ocean data systems
Marine Geomatics	Nova Scotia Community College	Marine Geomatics	Hydrographic surveying, GIS, spatial data analysis
Metal Fabrication & Welding	Nova Scotia Community College	Metal Fabrication, Underwater Welding	Structural fabrication, offshore construction, welding techniques
Engineering (General)	Dalhousie University, First-year bridging programs available from St. Francis Xavier University, Acadia University, Cape Breton University	Bachelor or Engineering in Mechanical, Electrical, Civil Engineering	Infrastructure design, systems integration, renewable energy systems
Ocean Sciences	Dalhousie University, Saint Francis Xavier University	Bachelor of Science Oceanography, Ocean Research Programs	Ocean systems, climate science, marine ecosystems

Source: (WSP Interviews, 2025)

According to interviewees, NSCC is set to launch a wind turbine technician program in 2026, but additional technician and fabrication programs are needed to meet growing demand across campuses. Training needs extend beyond core trades to include specialized areas such as ROV piloting, underwater welding, marine vessel operation, naval architecture, and offshore safety. While institutions like NSCC, Dalhousie University, and Saint Francis Xavier University offer programs in ocean technology, marine engineering, and environmental monitoring, interviewees stress that current capacity and alignment with offshore wind sector requirements must expand to support workforce readiness.

Survey Insights: Municipal representatives were asked to what extent they agree or disagree with the following statement: “Members of my community have the local education and training needed to support employment opportunities related to a subsea cable and additional buildout of OSW.” Most respondents (10/18) noted they neither agree nor disagree, followed by 5/18 agree, 2/18 disagree, and 1/18 strongly agree.

Neither agree nor disagree results may indicate that municipal representatives are unsure about whether the local education and training needed to support employment opportunities is available in their area or they agree that specific programs are available while being aware that there may be gaps in other education or training areas. More research is needed to determine next steps.

Program Spotlight: Wind Turbine Technician Certificate (NSCC)

Credential: Certificate
Start Date: September 2026
Length: 1 Year

This program prepares students to install, troubleshoot, repair, and maintain wind turbine systems and components. Training includes electrical, mechanical, and hydraulic systems, with a focus on safety procedures, instrumentation, blueprint reading, and technical problem-solving. Students complete a mandatory five-week field placement to apply skills in real-world settings. Graduates are equipped to support Nova Scotia’s clean energy transition and meet growing labour demand in the wind energy sector.

7 POTENTIAL SOCIAL EFFECTS

7.1 INTRODUCTION

Large-scale infrastructure projects, such as subsea cable and additional OSW buildout, can reshape communities through physical, social, and economic impacts. The focus of the potential social effects analysis, as presented in this report, is on how these changes may affect social wellbeing and service / infrastructure use. For example, the loss of green space can reduce physical activity and affect mental health. An increase in income levels can positively influence access to housing and education. Income inequality can reduce social cohesion and strain community support systems (Impact Assessment Agency of Canada, 2020b).

For the potential social effects portion of this study, WSP conducted a high-level review of potential effects on community wellbeing and infrastructure related to a proposed subsea cable and additional OSW development. The analysis includes potential social effects during construction and operations to onshore communities.²⁸ The social environment includes demographics, community services, and institutions such as government, education, and health care. In addition to broader social indicators, the study highlights key areas likely to interact with project activities, including housing, health care, and emergency services. This report represents a preliminary analysis intended to inform early-stage planning; refinements are expected as project development progresses and additional information becomes available.

Report structure:

- **Section 7.2 Methodology:** Describes the approach used to develop the community profile, identify Valued Components (VCs) and potential effects pathways, and conduct interviews with key knowledge holders.
- **Section 7.3 Community Profile:** Presents relevant human environment data for Nova Scotia.
- **Section 7.4 Potential Valued Components and Effects Pathways:** Identifies key social wellbeing and infrastructure and services potential effects pathways.
- **Section 7.5 Lessons Learned and Mitigation Considerations:** Outlines high-level mitigation strategies and approaches to enhancement positive effects.

²⁸ Potential impacts of a wind energy project on other marine users are not included in the scope for this report. Other marine use will be important in the impact assessment and the design process once the development proposal becomes available.

7.2 METHODOLOGY

To support early planning for a potential OSW project, WSP applied a mixed-method approach aligned with Impact Assessment Agency of Canada (IAAC) guidance to provide preliminary insights into potential social effects. The methodology included four key components:

- **Community Profile Development:** WSP analyzed social, demographic, and labour force characteristics data using publicly available sources such as Statistics Canada.
- **Scoping Reviews:** So that insights included in this report are relevant to the local context, WSP primarily relied upon:
 - The (2025) Nova Scotia Regional Assessment Report and the (2025) Newfoundland and Labrador Regional Assessment Reports for OSW developments: These reports share a common structure, designed to inform responsible offshore wind (OSW) development through evidence-based planning and engagement. They employ independent expert committees, conduct engagement and data gathering to collect qualitative insights, and phased reporting to support tailored and accurate recommendations.
 - The (2025) “Harnessing the Potential for a More Equitable Future in Newfoundland and Labrador: Applying Gender-Based Analysis Plus (GBA Plus) to Offshore Wind Development” report: The Canadian Research Institute for the Advancement of Women was conducted at the request of the Impact Assessment Agency of Canada to inform the Agency’s Newfoundland and Labrador Regional Assessment Reports. It explains and demonstrates what an intersectional approach to planning for economic benefits for diverse populations would look like.
 - In addition, key publications were drawn from databases including Elsevier, ScienceDirect, Springer, JSTOR, and Wiley. Additionally, informal materials like reports from the Canada-Nova Scotia Offshore Energy Regulator (CNSOER), the Impact Assessment Agency of Canada (IAAC), news articles, and trade magazines were consulted. The search strategy involved combining the term “offshore wind energy” with keywords such as “socioeconomic impacts,” “housing prices,” “tourism,” “supply chains,” and “social change.” Insights also gathered from previous offshore Nova Scotia oil and gas socio-economic assessments.
- **Engagement of Key Knowledge Holders:**
 - WSP conducted seven (7) semi-structured interviews with key knowledge holders including:
 - Non-profits (e.g., workforce development)
 - Academics (e.g., technology and environment programs, assessment experts)

- Industry (e.g., Indigenous-owned businesses, international energy company representatives)
 - These interviews helped confirm the relevance of selected VCs via thematic analysis and informed the selection of indicators and analysis methods.
- **Nova Scotia Municipal Survey:** See section 7.2 for more information.
- **Valued Components (VCs), Potential Effects Pathway Identification, Mitigation Considerations:** WSP identified potential VCs, effects pathways, and mitigation considerations based on the scoping review results. Initial VCs were refined through stakeholder engagement and the application of professional judgment by the Project Team and the province, drawing on experience with similar infrastructure projects and regional knowledge.

7.2.1 LIMITATIONS

Limitations for this study include:

- **Data Gaps:**
- Demographic and scoping review data may not fully capture recent or localized changes in community conditions or infrastructure.
 - Limited data available on socio-economic impacts of subsea cables and additional OSW specific to Canada. International research may not be applicable in Nova Scotia.
- **Limited Input of Key Knowledge Holders:** With seven (7) completed interviews, the range of perspectives, especially from underrepresented or marginalized groups, is limited.
- **Qualitative Focus:** The analysis relies on qualitative methods and expert judgment, which may introduce subjectivity and limit replicability.
- **Scoping Breadth:** A high-level review may overlook specific project or cumulative effects that would emerge in a more detailed assessment.
- **Equity Analysis:** An equity analysis is not included within the scope of this study. As such, potential differential effects to populations who may be more vulnerable and less resilient to project effects are not included.
- **Indigenous Interests and Rights Analysis:** An analysis of Indigenous Rights and Interests is not included within the scope of this study. As such, potential differential effects to Indigenous Peoples are not included.

- **Mitigation Generality:** Proposed mitigation measures are high-level and may not address localized or project-specific risks without further analysis and refinement.
- **Census 2021 Data:** The COVID-19 pandemic affected the planning, collection, and interpretation of data for the 2021 Census in Canada. The limitations outlined below should be considered when analyzing 2021 Census data, especially when comparing with previous census cycles or interpreting demographic trends. Key limitations include:
 - Operational Adjustments: Statistics Canada adopted a contactless collection strategy. This included cancellation of early enumeration in remote Indigenous and northern communities, use of online responses, and increased telephone follow-ups.
 - Response Bias and Data Interpretation: Respondents were asked to report their situation as of May 11, 2021. Pandemic-related disruptions may have influenced how individuals reported employment, education, commuting, and household composition.
 - Population Mobility and Demographic Shifts: The pandemic caused changes in migration patterns, immigration timing, and household formation, which may have introduced anomalies in demographic trends.

7.3 NOVA SCOTIA COMMUNITY PROFILE

To understand the community context, social effects studies typically include community profiles that describe factors including but not limited to demographics, factors affecting well-being (e.g., income, cost of living, language), key social values and concerns (Impact Assessment Agency of Canada, 2020a). For example, Census 2021 data can be used in community profiles to better understand:

- Current and expected infrastructure capacity and utilization (e.g., via population growth rates, housing statistics)
- Equity and inclusion dimensions (e.g., via racialized population statistics, comparing men+ and women+ rates for key statistics such as employment)
- Workforce readiness (e.g., via labour force participation, educational attainment, employment sectors and occupational trends)

7.3.1 SOCIAL AND DEMOGRAPHIC CHARACTERISTICS

This section provides an overview of key social and demographic characteristics for the Province of Nova Scotia, including:

- Age, gender, and population growth;
- Migration and mobility;
- Immigration;
- Language;
- Educational attainment; and
- Housing.

Key social and demographic insights are outlined in [Table 7-1](#). This table represents a preliminary analysis of Census 2021 data intended to inform early-stage planning; refinements are expected as project development progresses and additional information becomes available.

Table 7-1: Summary Insights of Social and Demographic Characteristics, Census 2016 and 2021

Characteristic	Relevant Demographic Insights
Age, gender, population growth	<ul style="list-style-type: none"> → Aging Population: The 65+ age group grew by 17.1% between 2016 and 2021. This growth may indicate a need to consider health services, accessibility, and workforce renewal in project planning and community engagement. → Recent Population Growth: A 5.0% increase between 2016 and 2021 in total population may signal rising demand for housing, infrastructure, and energy – factors that intersect with OSW development impacts and opportunities. → Projected Population Growth: Statistics Canada's 2022 projections, based on the 2021 census, estimate Nova Scotia's 2043 population could range from 1,006,300 to 1,236,300. Even under the high-growth scenario, this increase – 15.3% over 19 years – is lower than recent trends. All scenarios show population aging and more deaths than births, meaning growth depends on international and interprovincial migration. Growth is concentrated in Indigenous communities and immigrant-rich areas. Given their younger age profiles, targeted outreach and education about OSW industry opportunities and training programs may be important for youth in these communities (Impact Assessment Agency of Canada, 2020b).
Migration and mobility	<ul style="list-style-type: none"> → Stable Population Base: 87.8% of residents did not move from 2020 to 2021, which may indicate a stable population that may experience direct, long-term impacts from project development. → Rising In-Migration: 2.4% of residents moved to Nova Scotia from other provinces, a 0.7% increase since 2016, which may suggest growing interest in the region, which may in turn influence housing demand and workforce availability.
Immigration	<ul style="list-style-type: none"> → Growing Immigrant and Non-Permanent Resident Population: Immigrants made up 7.5% of the population (up 1.4% since 2016), and 2.3% were non-permanent residents, which may indicate the need for inclusive workforce planning and community engagement strategies. → Shifting International Immigrants Demographics: A growing share of immigrants between 2016 and 2021 were born in Asia (40.4%) and Africa

Characteristic	Relevant Demographic Insights
	(9.2%), which may suggest the importance of culturally responsive communication and services in potential OSW development areas.
Visible Minority/ Racialized Population	<ul style="list-style-type: none"> → Demographic Change: The increase in the racialized population in Nova Scotia, from 3.2% in 2016 to 4.4% in 2021, reflects a shift in the province's demographic composition. This change supports the need for workforce strategies that align with the diversity of the population. → Equity in Workforce Planning: Black, South Asian, and Chinese groups form the largest segments of the racialized population. Workforce planning and service delivery should include targeted engagement, culturally responsive approaches, and equitable hiring practices to meet the needs of these communities.
Language	<ul style="list-style-type: none"> → Predominantly English-Speaking Population: 89.3% of residents reported knowing only English in 2021, which may indicate that project communications, engagement, and documentation should prioritize English for broad accessibility. → Presence of Indigenous Language Speakers: The presence of Indigenous language use (0.2%) highlights the importance of culturally relevant engagement with Indigenous communities.
Educational attainment	<ul style="list-style-type: none"> → Skilled Trades and Technical Training: 8.6% of the population reported an apprenticeship or trades certificate, which may highlight a potential local workforce base for technical roles in OSW construction and maintenance. This data point may also present an opportunity to increase trades training to further enhance the locally available workforce and better align with the growing demands of the OSW sector. → Rising Higher Education Levels: 24.3% of residents held a bachelor's degree or higher, an increase between 2016 and 2021, which may indicate growing capacity for professional and technical roles to support OSW development (e.g., roles in planning, management, engineering, and environmental services).
Housing	<ul style="list-style-type: none"> → Housing Pressure and Affordability: While 82.1% of households reported spending less than 30% of income on shelter in 2021, 17.9% exceeded this threshold, which may highlight potential sensitivity to housing demand increases from project-related workforce in-migration. → Repair and Suitability Needs: 8.2% of dwellings required major repairs in 2021, and 3.6% were not considered suitable, which may indicate existing infrastructure strain that could be exacerbated by large-scale development.

Source: (Government of Canada, Statistics Canada, 2022), (Government of Canada, Statistics Canada, 2017), (WSP, 2025)

Data tables for social and demographic characteristics are available in Appendix A-2.

Survey Insights: Municipal representatives were asked to select the key drivers of population change in the last five years. The most popular options selected were interprovincial migration (15/22), followed by pandemic-driven relocation (12/22), aging population (11/22), and international immigration and non-permanent residents (8/22) as outlined in **Figure** Figure 7-18-1.

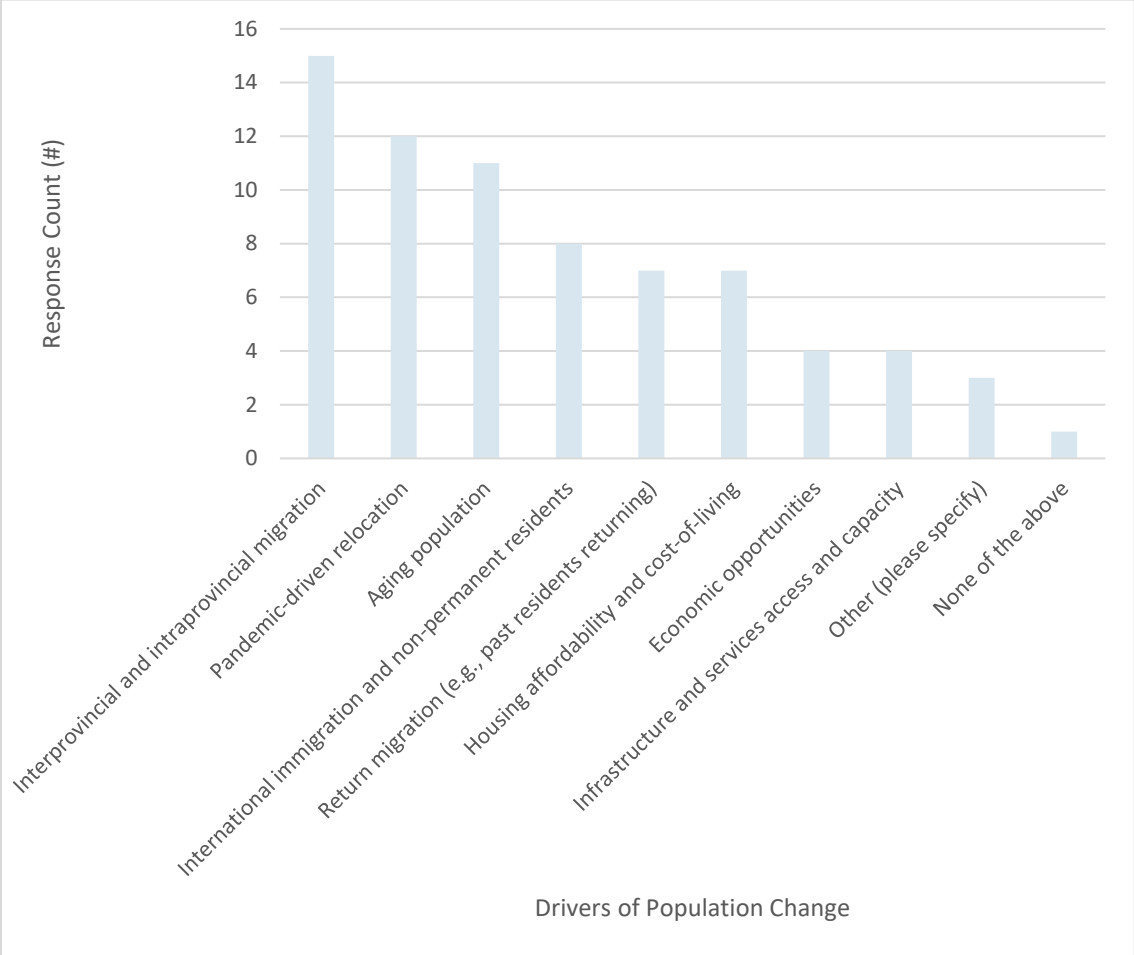


Figure 7-1 Drivers of Population Change in the Last Five Years, Nova Scotia Municipal Survey 2025

7.3.2 LABOUR FORCE CHARACTERISTICS

This section provides labour force characteristics and economic sector overviews for the Province of Nova Scotia, including:

- Participation and unemployment;
- Labour supply; and,
- Income.

Key labour force characteristic insights are outlined in Table 7-2. This table represents a preliminary analysis of Census 2021 data intended to inform early-stage planning; refinements are expected as project development progresses and additional information becomes available. It should be noted that the COVID-19 pandemic affected the planning, collection, and interpretation of data for the 2021 Census in Canada. These limitations should be considered when analyzing 2021 Census data, especially when comparing with previous census cycles or interpreting demographic trends (see 8.2 for more information).

Table 7-2: Summary Insights Social and Demographic Characteristics

Characteristic	Relevant Demographic Insights
Participation and Unemployment	<ul style="list-style-type: none"> → High Unemployment Rate: The unemployment rate rose to 12.7% between 2016 and 2021, which may indicate a potential pool of available labour that could benefit from targeted training and employment opportunities in the OSW sector. → Employment Rate Decline: Despite population growth, Nova Scotia's labour force is shrinking and aging due to low birth rates, an older population, and youth outmigration. From 2019 to 2024, employment grew at just 0.6% annually, below the national average of 1.5%. Supporting a new subsea cable and OSW buildout industry may require investment in training and construction-related skills. Data from the Canadian apprenticeship system shows projected shortages by decade's end in key trades such as bricklaying, carpentry, crane operation, power line work, roofing, and pipefitting (Impact Assessment Agency of Canada, 2020b). → Labour Force Equity Participation Challenges: The participation rate declined to 59.5% between 2016 and 2021, with a notable drop among women+, which may suggest potential barriers to workforce engagement that may affect local hiring for OSW projects.
Labour Supply	<ul style="list-style-type: none"> → Strong Base in Construction and Trades: Construction was the leading industry for men+, and trades and transport occupations were the top occupation group in 2021, indicating the local workforce may have relevant skills for OSW construction and services. → Gendered Industry Participation: Women+ were concentrated in health care, education, and service sectors in 2021, which may suggest the need for targeted

Characteristic	Relevant Demographic Insights
	outreach and training to support more inclusive participation in OSW-related roles.
Income	<ul style="list-style-type: none"> <li data-bbox="431 380 1422 583">→ Stable Labour Market: Men+ and women+ in Nova Scotia increased their employment income between 2016 and 2021, with women+ showing stronger growth in both median and average earnings. Rising incomes often correlate with higher educational attainment and labour market stability. These are factors that align with workforce readiness for large-scale infrastructure projects like OSW <li data-bbox="431 600 1422 737">→ Strengthening Gender Representation: More women+ entered full-year full-time work, increasing by 6.0%, which strengthened gender representation in stable employment. This shift can help diversify the OSW labour force and may support inclusive hiring practices in OSW. <li data-bbox="431 753 1422 1020">→ Shifts in Income Composition: The increase in government transfers may be linked to demographic changes, particularly the aging population and the resulting growth in the number of retirees. This shift likely contributes to higher reliance on income supports such as public pensions. At the same time, rising unemployment during the same period may also explain part of the increase in transfers, through programs such as Employment Insurance. Understanding these shifts is important for planning inclusive employment strategies and ensuring that income support systems remain responsive to evolving needs.

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

Data tables for labour force characteristics are available in Appendix A-2.

7.4 POTENTIAL VALUED COMPONENTS AND EFFECTS PATHWAYS

7.4.1 VALUED COMPONENTS

The potential health, social, economic, and environmental effects of development projects, such as a subsea cable and additional OSW buildout, are deeply interconnected. Identifying valued components (VCs) that reflect this complexity is important for accurate impact assessments. VCs may hold scientific, cultural, spiritual, or economic significance, and are identified by the regulators in consultation with other interested parties. Once selected, these components guide the assessment process (Impact Assessment Agency of Canada, 2021).

This study groups potential social VCs into two categories:²⁹

- social wellbeing (including quality of life and health); and,
- community services and infrastructure.

Examples of the different dimensions of the social wellbeing VC are outlined in [Figure 7-2](#).

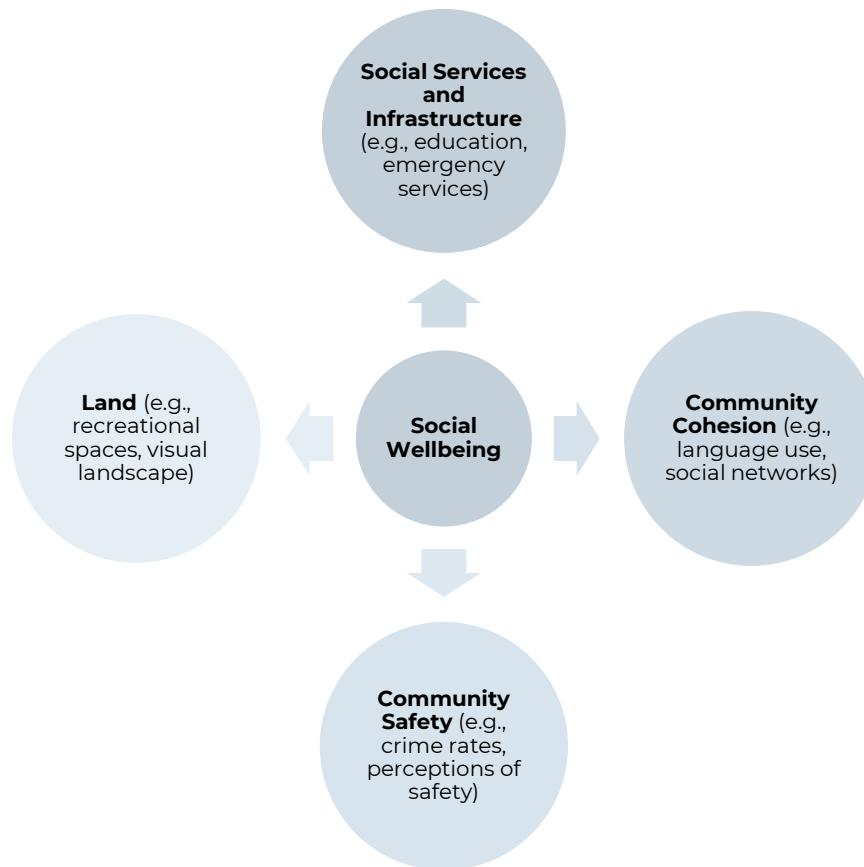


Figure 7-2: Social Wellbeing Examples of Potential Valued Components

WSP has identified the priority potential VCs for this study based on the research identified in the following sections. These VCs represent a preliminary analysis intended to inform early-

²⁹ Among eight other valued components, the (2025) NS Report identifies health, community and economy. The potential socioeconomic effects pathways are categorized into the following: a change to employment and economy, a change to community services and infrastructure, a change to quality of life / health, and inequities and barriers to underrepresented and underserved groups. Economy is analyzed in section 6 and inequities and barriers to underrepresented and underserved groups is not within the scope of this study.

stage planning; refinements are expected as project development progresses and additional information becomes available.

7.4.2 POTENTIAL EFFECTS PATHWAYS

Subsea cable and additional OSW buildout activities can influence VCs and the broader socioeconomic landscape through various impact producing factors and effects pathways. Each phase offers different short- and long-term opportunities, potentially leading to both positive and negative impacts (Impact Assessment Agency of Canada, 2020c).

The (2025) Nova Scotia Report identified impact producing factors for typical OSW projects. Cable-specific are outlined in Table 7-3:

Table 7-3: Impact Factors and Cable-Specific Potential Effects Pathways, 2025

Impact Factor	Potential Effects Pathway Description
Atmospheric emissions	→ Atmospheric emissions can be produced by cable and turbine installation vessels.
Artificial lighting	→ Artificial lighting may be produced during construction (temporary) and operations, including vessel lights, navigational lighting for mariners, aviation obstruction lighting, and work/safety lighting for maintenance and operations during nighttime hours.
Vessel activity	→ Vessel activity may be frequent during cable burial and installation. There is also potential for vessel discharge during these activities.
Noise and vibrations	→ Noise and vibrations may be produced during geophysical surveys to assess the ocean bottom at a prospective development site during the site assessment phase and the construction activity for the subsea cable.
Exclusion zones	→ Exclusion zones may be developed for installation and operation of cables.
Seabed disturbance	→ Seabed disturbance can occur during cable burying activities, such as dredging, excavation to level the seafloor, pre-trenching the cable route for adequate burial depth, and laying electrical cables across navigation channels.
Electrification of subsea power cables	→ Subsea power cables generate electromagnetic fields (EMFs) when energized. These fields are strongest near the cables and vary with current type. HVDC cables produce stronger fields than AC due to higher power transmission. Shielding and burial of cables typically reduce EMF exposure to the surrounding environment.
Presence of infrastructure	→ Subsea cable infrastructure will be present.
Waste handling and management	→ Potential waste sources from an offshore wind project include wastewater discharges, scour protection materials, vessel combustion emissions, dredged material from infrastructure installation, and chemical releases from accidents or malfunctions.
Accidents and malfunctions	→ OSW projects may experience accidents or malfunctions such as subsea cable damage or failure.

Source: (Impact Assessment Agency of Canada, 2020b).

Effects pathways link project activities to potential impacts on VCs. They help identify which VCs are at risk and guide the assessment of significance and the development of mitigation, and monitoring plans. For example, pile-driving (activity) → underwater noise (pathway) → disturbance to local community members (Social Wellbeing VC) (Impact Assessment Agency of Canada, 2020c).

The following sections outline findings from the scoping review that identify key project activities, associated stressors, and their potential interactions with VCs. All identified findings are in alignment with the (2025) Nova Scotia Report.

Note: This section presents a preliminary analysis to support early-stage planning. As subsea cable and additional OSW buildout development advances and more data become available, refinements are expected. Not all potential VCs and effects pathways identified may apply to the final project scope.

7.4.2.1 SOCIAL WELLBEING

Social wellbeing refers to the overall quality of life within a community. It encompasses various factors such as, but not necessarily limited to visual aesthetics, psychosocial health, community cohesion, and access to employment (Impact Assessment Agency of Canada, 2020b). WSP employed a scoping review of publicly available literature to identify priority potential links between impacts to social wellbeing and the development of a subsea cable and additional OSW buildout.

The following sections outline findings from the scoping review to identify priority potential valued components, effects pathways, and effects of OSW projects. The review was further informed by interviews with seven (7) key knowledge holders and a survey of municipal representatives across Nova Scotia.

VISUAL AESTHETICS (SEASCAPE, RECREATION, AND TOURISM)

In impact assessments, visual assessments evaluate whether a landscape or seascape can accommodate visual changes from a project without reducing scenic quality or viewer experience. This involves examining how the project alters the view's composition, whether it fits the character of the setting (e.g., industrial or natural), and how it may affect people's connection to place (Impact Assessment Agency of Canada, 2025a).

This section examines how OSW projects may affect coastal landscapes, visual quality, recreational use, and tourism. It focuses on turbine visibility, changes to scenic character, and potential disruptions or benefits to tourism and outdoor activities in coastal areas.

WIND TURBINES AND OFFSHORE BUILDOUT VISIBLE FROM SHORE

Primary impact phase(s): Construction, operations

Potential social effect(s): Changes to character of viewshed, increased tourism, decreased tourism

International research: Several international studies link potential adverse effects to recreation and tourism to OSW projects (Mariel Alem-Fonseca et al., 2020). One German studies found that prior to construction residents were concerned that the concentration of large turbines may negatively impact tourist and local recreational user leisure areas on both land and sea (Sunak & Madlener, 2017). Another study indicated that the impact of OSWs on tourism varies with their distance from the shore. In the French Mediterranean, wind farms located more than eight to 12 kilometers offshore have no impact on tourism, whereas those within eight kilometers can negatively affect tourism if not partnered with coherent environmental policies or related recreational activities (Mariel Alem-Fonseca et al., 2020).

Most reviewed international studies, however, suggest OSWs do not adversely affect recreational users and tourists in terms of tourist numbers, experiences, or spending. Perceptions of adverse social impacts on tourism are influenced by individual attitudes toward aesthetics and renewable energy, rather than empirical data on visitor behaviour and spending (Cleary, 2020). More research is needed on post-construction perceptions of OSW to understand visitor satisfaction and travel behaviour over time (Mariel Alem-Fonseca et al., 2020).

Indeed, with the growing emphasis on renewable energy, OSWs may draw additional tourists to an OSW area. Combined with marketing efforts, OSW projects can foster new types of tourism in rural areas, such as "green tourism" or "turbine bagging" (Mariel Alem-Fonseca et al., 2020).

Local research: Tourism is a key economic sector in Halifax and across rural and coastal Nova Scotia. It supports investment and employment and is often preferred over industries like mining or gas. Some view it as more stable, as it relies on local infrastructure and cannot be outsourced. In coastal areas with seasonal work patterns, such as fishing, tourism offers alternative income—e.g., fishers running ecotourism operations in summer (Impact Assessment Agency of Canada, 2025b).

Within the (2025) Nova Scotia Report, the Committee notes that some visual aesthetic variables can be modeled when project details are known. Others are subjective and cannot be quantified (Impact Assessment Agency of Canada, 2025b). Impact varies by viewer activity and perspective. The (2025) NFLD Report also notes that the visual impact of turbines depends on project-specific and receptor-specific factors. These include the development's physical form (e.g., turbine size, number, layout), ambient conditions (e.g., distance, weather, time), human perception (e.g., depth, contrast, familiarity), and the sensitivity and value of visual and seascape receptors (Impact Assessment Agency of Canada, 2025a).

With that caveat, the (2025) Nova Scotia Report notes that the visibility of offshore wind farms is a common public concern, especially in coastal areas with wide, scenic views. Turbines seen

from parks, historic sites, beaches, trails, homes, or resorts may be viewed by some as visual intrusions. Visibility depends on turbine number, size, layout, weather, sea state, time of day, sun angle, and viewer elevation. Larger turbines are visible from greater distances, and visual effects may be limited by conditions like rain or fog. In addition, flashing turbine lights at night may disrupt visitor experiences at national parks and dark light reserves (Impact Assessment Agency of Canada, 2025b).

The (2025) Nova Scotia Report further links offshore wind turbine visibility to potential impacts on viewsheds and tourism, especially near parks and coastal recreation areas. On the other hand, the Nova Scotia Report also identifies the potential for increased tourism opportunities based on international research outlined above (Impact Assessment Agency of Canada, 2025b).

Net Zero Atlantic's (2024) "What We Heard Report" also identified community resistance to nearshore OSW due to potential impacts on tourism, fishing, and coastal views, particularly in tourism-dependent areas .

Interview Insights: Interviewees expressed mixed views on the potential effects of OSW development on visual aesthetics. One indicated that the turbines would be a positive addition to the seascape.

SUBSEA CABLE AND OTHER INFRASTRUCTURE NOT VISIBLE FROM SHORE

Primary impact phase(s): Construction

Potential social effect(s): Changes to character of viewshed

International research: The potential effects of electrical infrastructure, including substations and cables, on tourism remain unclear. Transmission lines and pylons can devalue natural amenities for recreation, tourism, and local commerce. International research suggests that visitors' reactions are more negative towards pylons than wind turbines, with nearly half of surveyed visitors in Ireland and Iceland reporting that pylons affected their countryside experience. OSW transmission infrastructure is often cited as the most negative type of development by recreational users (Mariel Alem-Fonseca et al., 2020).

Local research: The (2025) "Final Report: Regional Assessment of Offshore Wind Development in Newfoundland and Labrador" (NFLD Report) identifies potential effects from OSW development throughout all phases. Effects are linked to turbines, lighting, and associated vessels or equipment. Potential effects by phase are included in Table 7-4 and cable-specific effects are bolded (Impact Assessment Agency of Canada, 2025a).

Table 7-4: Potential Visual Aesthetic Effects of Offshore Wind Development Identified for Newfoundland and Labrador, 2025

Phase	Effect
Pre-construction / Construction	Seascape and visual changes from vessels, helicopters, equipment, and incomplete turbines
	Visible sediment plumes during cable installation
	Frequent vessel and helicopter activity between sites and ports
	Daytime construction increases visibility; nighttime lighting adds visual effects
Operation and Maintenance	Long-term presence of turbines alters viewsheds
	Turbines may obstruct views, including sunsets
	Rotating blades may cause shadow flicker and diffuse light changes
	Navigational lights visible at night
	Intermittent vessel and helicopter activity for maintenance
Malfunctions and Accidents	Short-term increase in visual impacts until repairs are completed
Decommissioning	Visual changes from turbine removal (It is unclear whether effects are positive or negative due to limited precedent.)

Source: (Impact Assessment Agency of Canada, 2025a)

No insights are available in the (2025) Nova Scotia Report on cable-specific visual impacts.

Interview insights: No interviewees provided insights into positive or adverse effects of a subsea cable and additional buildout not visible from shore on tourism.

QUALITY OF LIFE AND PSYCHOSOCIAL HEALTH (STRESS, ANXIETY, DISRUPTIONS TO COMMUNITY LIFE)

Definition: Stress and anxiety are considered potential psychosocial health effects that may arise from changes to the environment, economic conditions, or community dynamics. IAAC encourages proponents to assess how project-related factors—such as noise, visual impacts, displacement, or employment uncertainty—may contribute to increased stress or anxiety, particularly among vulnerable populations (Impact Assessment Agency of Canada, 2021).

Primary impact phase(s): Operations

Potential social effect pathway(s): Changes to community quality of life and psychosocial health

International research: Concerns in international research about wind turbines and wellbeing focus on noise, shadow flicker, and electromagnetic fields (EMF), particularly in onshore settings. While some individuals report symptoms such as sleep disturbance, stress, and anxiety, scientific reviews have not found consistent links between turbine operations and adverse health outcomes. The most consistent association is between onshore turbine noise and community annoyance, which can influence perceived stress and other self-reported symptoms. Annoyance is shaped by individual attitudes, visual impact, and expectations, rather than noise levels alone (Impact Assessment Agency of Canada, 2025a).

Local research: The (2025) Nova Scotia Report notes that during OSW farm construction and operation, vessels and helicopters transport personnel and supplies between shore bases, substations, and turbines. Vessel use related to subsea cables typically peaks during construction phases. In particular high levels of vessel traffic are linked to subsea cable installation and pile-driving. Increased traffic levels may result in disruptions to regular community life (Impact Assessment Agency of Canada, 2025b).³⁰

The (2025) Nova Scotia Report also links increased exposure to noise and vibrations and shadow flicker from turbines as a potential adverse effect for those working near and around the OSW site, but not for onshore community members. Potential effects from shadow flicker include fatigue, nausea, headaches, and dizziness. In addition, potential adverse effects on culturally and economically important marine species via noise, equipment activity, and from EMF may disrupt harvesting and ceremonial practices, with consequences for community mental health and wellbeing (Impact Assessment Agency of Canada, 2025b).

Participants engaged to develop the (2025) NFLD Report raised questions about how OSW development and operation may affect human health, including potential impacts from sound and vibrations on coastal communities (Impact Assessment Agency of Canada, 2025a).

Interview Insights: No interviewees provided insights into positive or negative effects of a subsea cable and additional buildout on community stress and anxiety.

³⁰ Human health effects noted in the (2025) NS Report, but not highlighted in this social scope include potential effects that may arise from chemical degradation, spills, or sediment disturbance during OSW activities. Human health outside of effects to wellbeing is not included within the scope of this study.

SOCIAL CHANGE (SUBSTANCE ABUSE AND CRIME RATES)

Primary impact phase(s): Construction

Potential effect pathway(s): Change in crime, substance abuse, and mental health rates

International research: Adverse effects from offshore oil developments have been reported to include increased alcohol abuse, substance abuse, crime rates, as well as decreases in mental health and community satisfaction levels (Mariel Alem-Fonseca et al., 2020). United States (U.S.) (1995) research shows energy development communities have experienced changes in crime, mental health, and satisfaction (Seydlitz et al., 1995). It should be noted, however, that since that time expectations for the oil and gas sector with respect to health and safety and management of social impacts on communities has evolved for the better. More recently, a (2003) Canadian project with 5,780 workers saw no crime increase or substance abuse issues (Storey & and Jones, 2003) (Mariel Alem-Fonseca et al., 2020).

Shift work in OSW and offshore oil, however, differ. Oil workers stay on platforms for weeks, while wind energy sector workers typically do not. OSW projects also typically employ fewer people than offshore oil projects. As such, some research suggests that these potential social changes from OSW may be less significant than those from offshore oil industries. Due to the lack of research and data on these social changes, reliable conclusions for OSW cannot be drawn (Mariel Alem-Fonseca et al., 2020).

Local research: The (2025) NFLD Report notes that engaged stakeholders expressed concern about OSW work camps potentially increasing rates of violence, drug abuse, and organized crime as experienced during the development of White Rose, an offshore oil project (Impact Assessment Agency of Canada, 2025a). As such, adverse effects may differ (Ryan, 2025). The (2025) Nova Scotia Report outlines similar concerns regarding adverse effects linked to work camps based on the (2025) “Harnessing the Potential for a More Equitable Future in Newfoundland and Labrador: Applying Gender-Based Analysis Plus (GBA Plus) to Offshore Wind Development” report (GBA Plus Report).

A (2003) report examined community perceptions of social impacts from the Hibernia offshore oil platform in Newfoundland and Labrador (Hibernia Report). It analyzes results from three iterations of a survey in nearby communities that took place between 1985 and 1996 to assess anticipated and actual effects over time. The 1996 survey took place following the peak of construction employment. Key social change findings include:

- Before and during site development, residents expected crime to rise (51.2% in 1985; 51.4% in 1992). By 1996, these concerns declined, as the project neared completion and RCMP data showed no increase in reported crimes (Storey & and Jones, 2003).

→ Alcohol / drug abuse was identified as a potential negative effect by 1.5% of respondents in 1955, 5.4% in 1992, and 0.0% in 1996. These responses suggest low perceived effects at the start of the project, and that long-term actual adverse effects were limited (Storey & Jones, 2003).

The (2025) GBA Plus Report notes that increases in violence, crime, and substance abuse can strain already overburdened social services, such as healthcare, mental health, and shelters (Canadian Research Institute for the Advancement of Women, 2025).³¹

Interview Insights: No interviewees provided insights into positive or adverse effects of a subsea cable and additional buildout on mental health, substance abuse, or crime rates.

Survey insights: When asked in an open-ended question to list any challenges or opportunities municipal representatives think Net Zero Atlantic should know about, one respondent noted concerns linked to the risks associated with a temporary workforce influx, including community change, party culture, and unsustainable economic effects.

Additionally, 7/21 respondents selected mental health and addiction services as an existing challenge for their municipality. However, views on how the project might affect these services were mixed: 3/5 respondents anticipated neutral effects, 1/5 expected negative effects, and 1/5 marked the question as not applicable.

No municipal representatives selected crime as an existing challenge nor linked the crime to any potential project effects.

INDIGENOUS INTERESTS

Context: In the context of Impact Assessments, Indigenous Rights refer to the constitutionally protected rights of Indigenous peoples under Section 35 of the *Constitution Act, 1982*. These Aboriginal and Treaty rights, which may encompass rights to land, waters, and natural resources; rights to hunt, fish, and trap for subsistence, cultural, or economic purposes; and rights to maintain and practice cultural traditions, languages, and governance systems (Impact Assessment Agency of Canada, 2021). Indigenous interests (which may not legally be defined as rights) also include social, cultural, economic, and environmental values that connect Indigenous peoples to their lands, waters, and resources.

The Peace and Friendship Treaties refer to agreements signed between the British Crown and the Mi'kmaq, Wolastoqey, and Peskotomuhkati before 1779. These historic Treaties affirm Indigenous Rights to hunt, fish, and gather in traditional territories for both essential needs

³¹ Differential and equity effects not within scope for this report.

and economic purposes. Section 35 of the Canadian Constitution confirms that Aboriginal and treaty rights, including those in the Peace and Friendship Treaties, are legally recognized. Since 1982, these rights have held constitutional protection in Canada. Today, these treaties remain legally recognized and continue to shape negotiations and rights in the Maritimes and Gaspé.

Primary impact phase(s): Planning, Construction, Operations

Potential social effect pathway(s): Changes to Indigenous Rights and Interests

Local research: The (2025) Nova Scotia Report and Net Zero Atlantic's "What We Heard Report" identify potential adverse effects of OSW development on fishing rights across Mi'kma'ki protected under Section 35 of the *Constitution Act, 1982* (Net Zero Atlantic, 2024) (Impact Assessment Agency of Canada, 2025b). In addition, if the subsea cable and additional OSW buildout resulted in changes in diet and reduced connection with community and Elders, there may be adverse effects to perceived health and well-being (Impact Assessment Agency of Canada, 2025b). The siting of the subsea cable and size of additional buildout will affect the intensity and distribution of these potential effects, depending on proximity to key harvesting areas and community access points.

Potential positive effects identified in the Nova Scotia Report may include increased Indigenous participation opportunities including job creation, business development, and youth training. Indeed, many community members are already trained as technicians to support the industry. In addition, opportunities may be created for Indigenous partnership and strategic ventures (Impact Assessment Agency of Canada, 2025b).

Strategic Partnership Example: Glooscap First Nation has expanded its economic base through Glooscap Ventures by forming strategic partnerships in renewable energy, retail, fisheries, and consulting. Since its launch in 2012, employment has increased from under 30 to over 80. The community now leads Mi'kmaq Nations in per capita own-source revenue and operates with a multi-million-dollar budget guided by seven-generation principles. These outcomes demonstrate the potential for Indigenous-led ventures and partnerships in the offshore wind sector (Impact Assessment Agency of Canada, 2025b).

Interview insights: Interviewees identified multiple potential effects from subsea cable and additional OSW development on Indigenous communities. These include disruptions to fish habitat, fisheries operations, and coastal livelihoods. Concerns were raised about inspection activities, trawling, and potential closures of fishing areas. Positive effects including opportunities for collaboration, partnership, and economic growth were also outlined. Employment and Economy

OSW projects can generate a range of economic impacts across different phases of development, including planning, construction, and operations. These impacts may be both positive and negative and can vary by region and community.

Changes to employment and spending was a key effects pathways identified in the (2025) Nova Scotia Report. OSW development can boost local employment and spending, leading to economic benefits. These potential benefits depend on factors such as inclusive procurement, sufficient local supply capacity, developer commitment to local hiring, and workforce readiness.³²

See Section 5 and 6 for a discussion of priority economic impacts for the subsea cable and additional OSW buildout.

Survey insights: Municipal representatives were asked to select the top three expected labour force impacts as a result of subsea cable and additional OSW buildout. Most respondents selected increased demand for trades and technical workers (14/18), followed by new job creation (13/18), opportunities for youth and recent graduates (7/18), growth in local supply chain and service industries (6/18), higher wages (4/18), and other impacts (3/18), while one respondent selected none of the above (1/18).

Municipal representatives were asked to select the type of impact – positive, neutral, negative – to the labour force change selected in the previous question. All labour force impacts had exclusively positive responses including increased demand for trades and technical workers (14/14), new job creation (12/12), opportunities for youth and recent graduates (7/7), growth in local supply chain and service industries (6/6), and higher wages compared to existing local industries (4/4). No valid neutral or negative responses were selected. These results reflect a consensus on the potential positive employment effects of subsea cable and offshore wind development.

In terms of other economic impacts, all respondents (10/10) who selected tax revenues as an existing challenge believed a subsea cable and additional OSW buildout would have a positive impact on municipal revenue. When asked in an open-ended question to list any challenges or opportunities municipal representatives think Net Zero Atlantic should know about, one respondent noted concerns about negative effects on the fishing, seafood, and lobster sectors. Another noted skepticism about local benefits, especially for low-income residents, and concerns about reliance on external labour. Municipal representatives also mentioned opportunities for local economic development including use of local ports, utility

→ ³² The (2019) Impact Assessment Act requires inclusion of GBA Plus in assessments and hiring strategies. Developers may be encouraged to prioritize local procurement and hiring, though trade agreements and capacity limits may restrict this. Demographic and labor data will inform assessments of local and provincial impacts.

improvements, and support industries, bringing people back to rural communities, and strong local belief in industry and project readiness.

7.4.2.2 INFRASTRUCTURE AND SERVICES

Community Infrastructure and services refers to the physical and organizational structures that support the functioning and resilience of a community. This includes transportation systems, utilities, communication networks, public facilities, and essential services that contribute to the wellbeing and connectivity of residents. A scoping review of publicly available literature identified potential links between OSW development—including subsea cable installation—and impacts on community infrastructure and services.

Note: The scale of development may also influence the potential infrastructure and service effects outlined in the following sections. For example, a 2 GW subsea cable and additional OSW buildout development with approximately 4,198 FTE jobs may have different infrastructure and service impacts compared to larger-scale projects with a larger influx of workers.

POPULATION IN-MIGRATION INFRASTRUCTURE AND SERVICE IMPACTS

Primary impact phase(s): Planning, Construction, Operations

Potential social effect pathways: Changes capacity and utilization of local services and infrastructure

International research: The potential adverse effects to community infrastructure and services as a result of a large in-migration of workers in rural communities are well-documented in international research (Mariel Alem-Fonseca et al., 2020). On the other hand, (2022) U.S.-based research shows OWS farms can lead to improvements in local infrastructure, such as port facilities, which are critical for construction and maintenance activities (Glasson et al., 2022).

Local research: According to the (2025) Nova Scotia Report, the (2025) NFLD Report, and the GBA Plus Report, population growth from OSW development can strain essential infrastructure and services. Increased use of roads, electricity, and internet, along with the construction of new facilities like substations and monitoring stations, can affect land use and community planning. An in-migration of people using public services such as healthcare, education, and childcare would require more workers and facilities to meet rising demand. Without investment in both infrastructure and the workforce that supports it, communities may struggle to service and retain new residents. Transportation access, especially for those without vehicles or with mobility needs, remains a barrier in many areas. Participants also emphasized the need for inclusive, welcoming communities supported by local programs and services, particularly for newcomers and underrepresented groups (Canadian Research Institute for the Advancement of Women, 2025) (Impact Assessment Agency of Canada,

2025b) (Impact Assessment Agency of Canada, 2025b). While effect intensity will depend on population in-migration size, even modest recent population growth (unrelated to OSW) has strained housing and healthcare services in the province (Impact Assessment Agency of Canada, 2025b). The (2003) Hibernia Report found that concerns about in-migration, housing costs, and school overcrowding were highest during early project phases but declined as the project progressed:

- In-migration concerns rose during site development (29.7% in 1992) but were not reported by 1996.
- Overcrowded schools followed a similar pattern, with 9.2% expressing concern in 1985, and 0% in later years (Storey, 2003).

These trends suggest that while initial expectations of strain on housing and services were present, they did not materialize as the project advanced (Storey, 1996).

Interview insights: Interviewees noted that population growth linked to OSW development could strain existing infrastructure and services. Concerns included pressure on housing, roads, water supply, and other essential systems. While municipalities may support the projects, there is recognition that local services could become more costly and stretched beyond current capacity.

Survey Insights: Municipal representatives were asked if an influx of workers for a subsea cable and additional buildout of OSW have a positive effect on their municipality. Most respondents selected positive impact (15/22), followed by neutral (4/22), not applicable (2/22), and negative (1/22).

Anticipated impacts varied each point in the life cycle for the development of a subsea cable and additional OSW buildout. Respondents selected construction / installation as having the most positive (13/18) and least neutral (3/18) effects. Development (9/18), manufacturing of equipment (9/18), and commissioning (8/18) were all identified as having comparable positive anticipated effects as outline in Figure 7-3. No negative effects were identified throughout the life cycle of the project for this question.

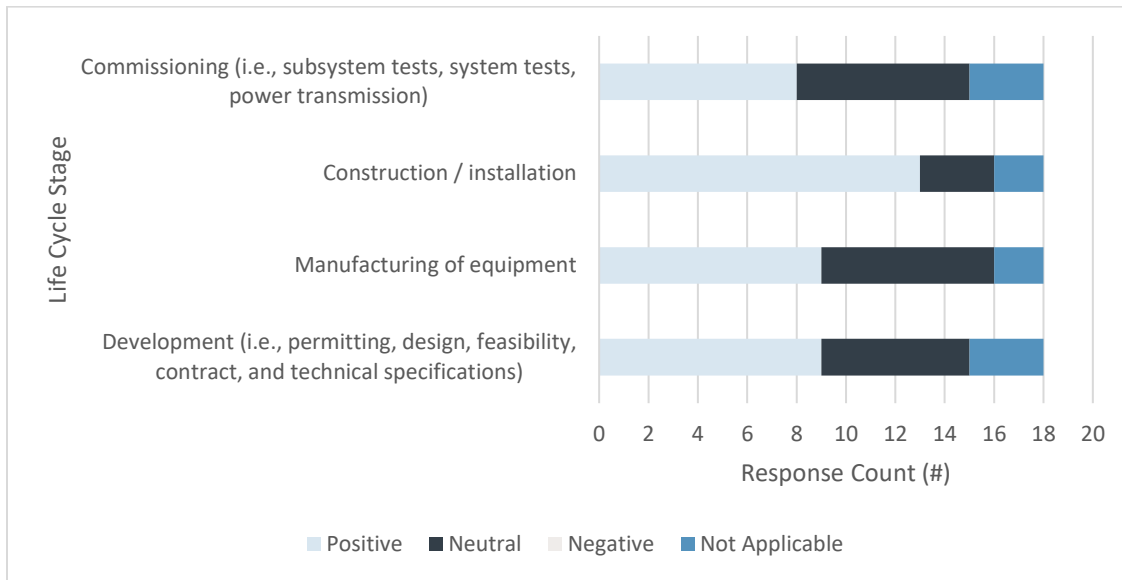


Figure 7-3 Type of Effect by Life Cycle of Subsea Cable and Additional Buildout, Nova Scotia Municipal Survey 2025

In addition, municipal representatives were asked to select the top three types of community services which would be most impacted in their municipality as a result of a subsea cable and additional buildout of OSW. The most frequently selected service was health services (9/18), followed by emergency services (6/18). Recreational and cultural services, education and childcare, and solid waste management were each selected by 3/18 respondents. Water and sanitation was selected by 2/18 respondents, and social services by 1/18. None of the above was also selected by 3/18 respondents, indicating a minority did not identify any of the listed services as relevant. Respondents that selected “other” input answers including “municipal electric utility”, “increased demand for temporary housing”, “fishing industry”, and “additional revenue would have a positive impact on all the above”.

Based on the social services selected in the previous question, municipal representatives were asked to identify the type – positive, neutral, negative – of expected effect. Services with mostly positive responses included recreational and cultural services (3/3) and solid waste management (2/3), indicating general satisfaction or optimism about potential project impacts on these services.

Services with more neutral or negative responses included education and childcare (3/3 negative), social services (1/1 neutral), emergency services (2/5 positive, 2/5 neutral, 1/5 negative), health services (2/9 positive, 4/9 neutral, 3/9 negative), and water and sanitation (1/2 positive, 1/2 neutral), as outlined in [Figure C-11](#). These results suggest mixed or critical views, particularly regarding education, childcare, and social support systems.

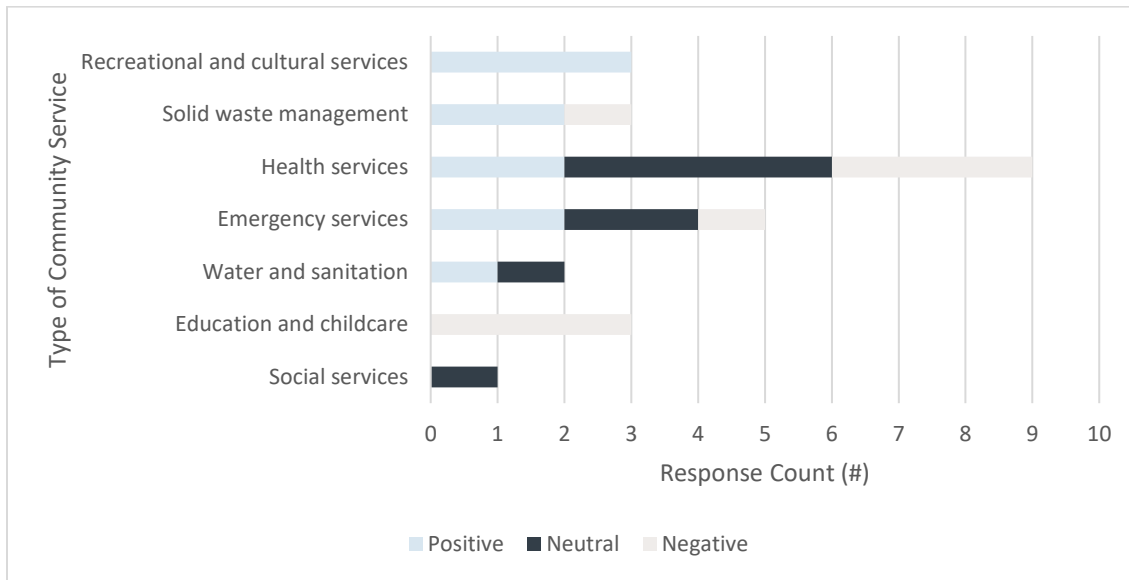


Figure 7-4: Expected Type of Project Effects on Community Services, Nova Scotia Municipal Survey 2025

Municipal representatives were also asked to identify the top three types of community infrastructure that would be most affected as a result of the development of a subsea cable and additional OSW buildout. The most frequently selected infrastructure was utilities and energy grid (14/18), followed by ports and harbours (12/18) and roads and transportation (10/18). Telecommunications was selected by 3/18 respondents, while none of the above was chosen by 2/18, as outlined in [Figure C-12](#). Public recreation facilities received no selections.

Municipal representatives were asked to select the type of impact – positive, neutral, negative – to the community infrastructure selected in the previous question. Infrastructure options with mostly positive responses included utilities and energy grid (9/13), ports and harbours (8/11), and telecommunications (2/3). These results may suggest that respondents generally view investments in these areas as beneficial to their communities. Options with more neutral or negative responses included roads and transportation (4/9 negative; 2/9 neutral), indicating more mixed or critical perspectives on its potential impact.

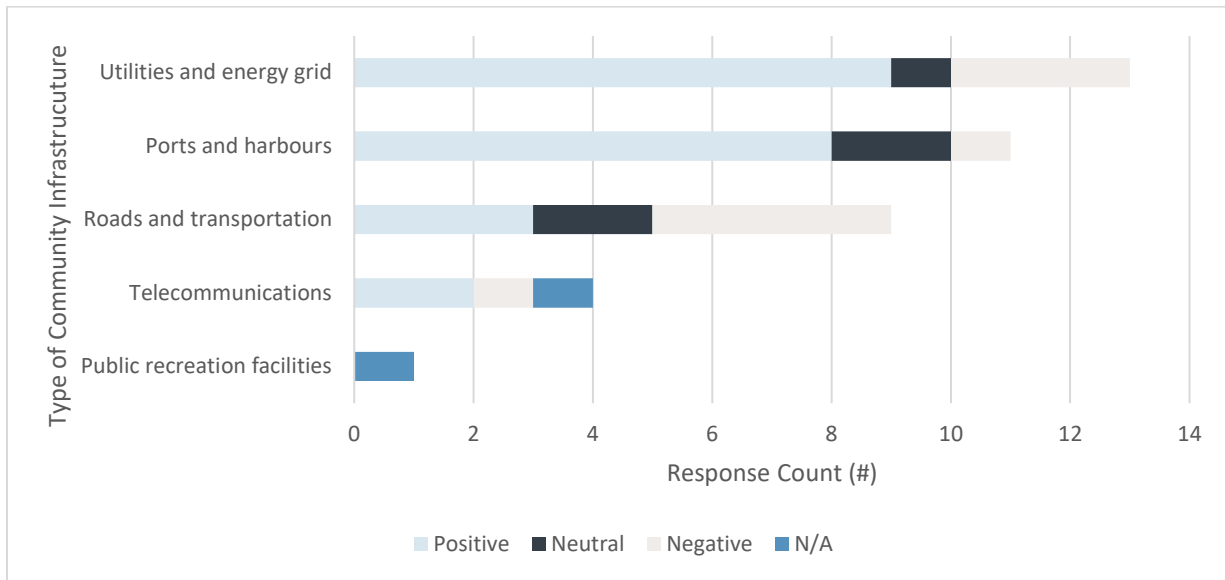


Figure 7-5: Expected Type of Project Effects on Community Services, Nova Scotia Municipal Survey 2025

In addition, when asked in an open-ended question to list any challenges or opportunities municipal representatives think Net Zero Atlantic should know about, one respondent noted concerns related to potential pressure on healthcare, childcare, and education systems.

HEALTH, EMERGENCY, AND URGENT CARE SERVICES

Definition: These services include the provision of primary health care, emergency medical response, and urgent care for individuals requiring immediate or short-term treatment. This encompasses access to family doctors and nurse practitioners, emergency departments, medical and urgent care clinics, and ambulance services, and is supported by healthcare infrastructure and personnel such as nurses, physicians, and medical aides (Impact Assessment Agency of Canada, 2021).

Local research: In 2023–24, Nova Scotia's emergency and urgent care system faced several key challenges. Patients experienced limited access to emergency services due to long wait times and hospitals operating beyond their admission capacity. There were not enough physicians and healthcare providers to fill vacancies in emergency departments. Many emergency facilities had outdated infrastructure, and communities lacked sufficient access to primary and urgent care services (Nova Scotia Government, 2023).

The Government of Newfoundland and Labrador noted that OSW development could increase coastal populations in several regions, raising demand on local health services. Temporary population growth during construction phases may strain hospitals and clinics, as seen in past industrial projects. Health systems must prepare for short-term service pressures linked to transient workforces. Participants engaged to develop the (2025) NFLD Report raised concerns about increased population during construction straining local hospitals and health services,

whether the growth is temporary or permanent (Impact Assessment Agency of Canada, 2025a).

According to the (2024) Cape Breton “Offshore Wind Community Engagement Survey Report Survey” results, health was among the top concerns for participants when considering the impacts of future OSW development, with 60–70% rating it as very important (Cape Breton Partnership, 2024).

Interview Insights: Interviewees noted that healthcare services in some communities are already at capacity, with busy medical clinics and emergency rooms. They expressed concern that OSW development could increase pressure on these services, especially in rural areas. While no impact was expected on food bank services for workers, the potential strain on healthcare systems was identified as a key issue.

Survey Insights: Municipal survey representatives were asked to select the top three types of community services which would be most impacted in their municipality as a result of a subsea cable and additional buildout of OSW. The most selected answer was health services (9/18) and emergency services (6/18). When asked to identify the type of expected effect, health services received mixed results. Four (4/9) respondents selected neutral effects, three (3/9) selected negative effects, and two (2/9) selected positive effects. Emergency services received mixed results as well with two (2/5) positive, two (2/5) neutral, and one (1/5) negative expected effect selected.

These anticipated adverse effects may be linked to existing challenges with healthcare and emergency services. Municipal representatives were asked to identify the top five challenges their municipality currently faces. The most popular response was healthcare and wait times (17/21). When asked to select the type of effect the project would have on the identified existing challenge area, seven (7/14) respondents selected neutral effects, three (3/14) selected negative effects, and two (2/14) selected positive effects. Housing Affordability and Availability

Primary impact phase(s): Construction, Operations

Definition: Housing affordability and availability refer to the cost, supply, and accessibility of residential properties, including rental and ownership options. This includes indicators such as affordability (shelter cost-to-income ratio), core housing need (housing that is inadequate, unaffordable, or unsuitable), and vacancy rates, which together reflect the ability of households to secure stable, adequate, and affordable housing (Statistics Canada, 2017).

Local research: Nova Scotia faces a housing shortage across all types. As of late 2022, the gap between supply and demand was about 27,300 units. At current construction rates, this gap will grow to over 44,000 by 2032. Meeting demand requires 104,800 new units by then, with a mix of unit sizes. Affordability is a major issue—home prices rose 63% from 2019 to 2022, and rents increased 24%. The vacancy rate is 1%. Rapid population growth, especially in Halifax Regional Municipality, adds pressure. Aging populations and rising student numbers are

shifting housing needs. Labour shortages in construction and limited housing for workers are slowing progress (Turner Drake & Partners Ltd et al., 2023).

Net Zero Atlantic's (2024) "What We Heard Report" notes that communities are concerned about the aggravation of existing housing affordability and availability issues, specifically if OSW projects rely on high numbers of out-of-province workers. Access to affordable housing is a widespread issue in Canada. This issue may disproportionately impact women, women with children, youth, seniors, Indigenous Peoples, and individuals with disabilities compared to other population subgroups (Canadian Research Institute for the Advancement of Women, 2025).

The (2003) Hibernia Report found that concerns about housing costs were highest during early project phases but declined as the project progressed. Increased housing costs were a concern for 15.5% of respondents in 1985 but dropped to 0% by 1992 and remained at 0% in 1996 (Storey, 1996).

Interview insights: Interviewees identified several existing housing challenges across Nova Scotia. Both rural and urban areas face shortages in housing availability and quality, with limited affordable multi-unit options for lower-income residents. The conversion of long-term housing into short-term rentals is further reducing supply. Population growth is intensifying these issues, driving up prices and increasing pressure on infrastructure. The housing shortage is also linked to a lack of skilled workers and concerns about the capacity of roads, water systems, and other community supports.

In terms of project impacts, interviewees expressed concern that new developments could increase housing demand in areas already facing supply constraints, such as Port Hawkesbury. This could lead to higher housing costs and property taxes, especially in rural or lower-income communities. Additional population inflows may strain local services, including healthcare and housing, though municipalities are generally supportive of the projects. Some areas may also face physical limitations in expanding their housing stock to meet increased demand.

Survey insights: Municipal representatives were asked to identify the top five challenges their municipality currently faces. While the most popular response was healthcare and wait times (17/21), the second most popular response was cost of living and affordability, excluding housing, (16/21) and affordable housing (13/21).

Respondents were then asked if the development of a subsea cable and additional OSW buildout would affect any of the existing challenge areas they selected in their last question and to characterize the effect in question. Respondents were unsure or divided about project effects on cost of living and affordability, excluding housing, with 5/14 respondents anticipating positive effects, 6/14 anticipating neutral effects, 1/14 anticipating negative effects, and 2/14 selecting not applicable. A similar divide emerged with project effects on affordable housing with 4/11 respondents identifying anticipated positive effects, 2/11 neutral effects, and 5/11 negative effects.

PORTS

Primary impact phase(s): Construction, Operations

Local research: Ports and their services are vital to developing a subsea cable and additional OSW buildout. Table 7-5 outlines key wharfs in Nova Scotia, some of which could support a subsea cable and additional OSW buildout.

Table 7-5: Key Port Location, Current Use, and Potential

Location	Current Use / Status	OSW Potential / Needs
Yarmouth, Digby, Shelburne	Primarily serve the fishing industry	Could support OSW vessels if berthage is expanded; fishery use will remain a priority
Shelburne	Considering infill west of finger pier	Needs engineering upgrades to support OSW vessel weight
Bowater (Liverpool)	Underutilized site	Requires dredging and a new wharf for OSW vessel access
Woodside (Halifax)	Existing marine terminal	Suitable for OSW, especially with planned expansion
Sheet Harbour	Undeveloped for OSW	Potential site for purpose-built wharf and marshalling area
McNally & Melford (Strait of Canso)	Industrial terminals with development potential	Can support purpose-built OSW wharves; McNally could also host a graving dock
Mulgrave (Strait of Canso)	Limited capacity	Suitable for handling smaller OSW components (e.g., anchors, chains)
Sydney (NovaPorte)	Large marshalling area	Can support purpose-built wharf and potential graving dock
Sydport Industrial Park	Existing wharves unsuitable	Requires removal and construction of new OSW-specific wharf
Atlantic Canada Bulk Terminal (Sydney)	Modified operations to support heavy cranes	Can support OSW with current adjustments

Source: (Impact Assessment Agency of Canada, 2020b).

The (2025) Nova Scotia Report notes that current port capacity is likely insufficient for subsea cable and OSW at any scale, and substantial investment is needed for Nova Scotia to benefit economically. Optimal locations for port investment depend on foundation types and industry scale, requiring further study and engineering (Impact Assessment Agency of Canada, 2025b).

In addition, existing port users—such as fishing, shipping, and tourism—may face congestion or displacement, or increased exposure to use-of-ports conflict due to the prioritization of OSW-related activities. Construction and increased industrial activity may also lead to noise, traffic, and environmental concerns for nearby communities (Impact Assessment Agency of Canada, 2025b). If potential adverse effects are mitigated, this additional activity in ports is expected to benefit local businesses.

Interview insights: Participants noted that port infrastructure will require upgrades to accommodate the scale of offshore wind turbines. They also emphasized the importance of shared access to port facilities.

Survey insights: Municipal survey respondents were asked to select the top three types of community infrastructure which would be most impacted in their municipality as a result of a subsea cable and additional buildout of OSW. The most selected answer was utilities and energy grid (14/18), followed by ports and harbours (12/18).

Respondents were asked to identify the type of anticipated effect on social services selected in the previous question. Municipal representatives identified effects to ports and harbours as mostly positive (8/12), with two respondents selecting neutral and one (1/12) selecting negative effects. When asked in an open-ended question to list any challenges or opportunities municipal representatives think Net Zero Atlantic should know about, one respondent noted opportunities for local economic development including the use of local ports.

7.5 POTENTIAL MITIGATION MEASURES

Clear effect pathways, including consideration of potential cumulative effects, guide the identification of effective mitigation or enhancement actions. The mitigation measures included in this report may not reflect the actual impacts of the planned subsea cable and additional OSW buildout in Nova Scotia. It is not expected that all mitigation measures will be applicable to the actual planned project.

While the (2025) Nova Scotia Report does not examine socio-economic issues in detail, it recommends that federal, provincial, and municipal authorities address pressures on already strained social infrastructure. The report cautions that meeting offshore wind labour demands through population growth requires investment in housing, healthcare, and education, alongside infrastructure such as ports and the electrical transmission grid (Impact Assessment Agency of Canada, 2025b).

Potential mitigation measures summarized in Table 7-6 are sourced from either the (2025) Nova Scotia Report or the (2025) NFLD Report. This table represents a preliminary analysis intended to inform early-stage planning; refinements are expected as project development progresses and additional information becomes available.

Table 7-6: Summary of Potential Mitigation Measures

Potential Social Effects Pathway	Potential Mitigation and Enhancement Measures
Changes to character of viewshed,	→ Mitigating potential adverse visual aesthetic effects of OSW buildout may require balancing local interests with renewable energy goals through early engagement and coordinated siting and design. Potential mitigation measures may include coordinating with municipalities and tourism stakeholders to reduce conflicts during peak tourism periods and coastal events; applying a coastal buffer to help reduce potential adverse

Potential Social Effects Pathway	Potential Mitigation and Enhancement Measures
increased tourism, decreased tourism	<p>offshore lighting effects on the onshore visitor experience; and engaging to better understand shoreline locations that are culturally important (Impact Assessment Agency of Canada, 2025b).³³</p> <p>→ Cable installation processes may aim to reduce potential adverse visual aesthetic effects of cable installation and operations (e.g., vessel movement, lighting, sediment plumes). Potential mitigation strategies include scheduling cable installation during low-visibility periods, using directional lighting, applying turbidity controls as needed, and limiting equipment and vessel presence near sensitive areas (Impact Assessment Agency of Canada, 2025a) (WSP, 2025).</p> <p>→ Showcasing subsea cable and additional OSW buildout through visitor centres, boat tours, and educational materials can help to enhance the potential positive effect of increased tourism (Impact Assessment Agency of Canada, 2025a).</p>
Changes to community life and wellbeing	<p>→ Engaging coastal communities early to identify areas that may be affected by offshore lighting, noise, vibrations, or exclusion zones can help to mitigate potential adverse noise and vibration effects (Impact Assessment Agency of Canada, 2025b).</p> <p>→ Mitigation measures that can help reduce potential negative effects to sensitive fish species and indirectly mitigate potential decreases in community mental health include: selecting cable routes to avoid sensitive fishing areas and covering subsea cables with scour protection where burial is not possible or where burial could disturb sensitive habitats (Impact Assessment Agency of Canada, 2025b).</p>
Change in crime, substance abuse, and mental health rates	<p>→ If considering a work camp to support the subsea cable and additional offshore buildout, special consideration may be needed to offset potential adverse effects and build positive community relationships. (Impact Assessment Agency of Canada, 2025b).</p> <p>→ In the absence of a dedicated construction worker camp, potential community impacts may be mitigated through coordinated housing strategies, transportation planning, and workforce management protocols developed in collaboration with local authorities.</p>
Changes to Indigenous Rights and Interests	<p>→ Early engagement and strategic partnerships development with Indigenous Nations can support positive subsea cable and additional OSW buildout effects and help to mitigate adverse effects (Impact Assessment Agency of Canada, 2025b). Accommodation can be mutually beneficial and key to the success of a project.</p>
Changes capacity and utilization of local services and infrastructure	<p>→ Strategic planning from the province and municipalities to support key infrastructure (including ports and housing) and necessary services can help to mitigate adverse effects related to potential increased demand from OSW-related population growth. These areas fall under government responsibility, but developers and private sector partners can support planning and contribute to infrastructure development through collaboration and investment (Impact Assessment Agency of Canada, 2025b).</p>

Source: (Impact Assessment Agency of Canada, 2025b) (Impact Assessment Agency of Canada, 2025a), (Net Zero Atlantic, 2024), (WSP 2025)

³³ Note: It is unlikely any one mitigation measure can fully satisfy all viewers unless turbines are placed beyond visible range (Impact Assessment Agency of Canada, 2025b).

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A NOVA SCOTIA SUBSEA CABLE PERMIT MATRIX

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
Federal Permits/Approvals						
Marine Lease or Licence for Occupation	Canada-Nova Scotia Offshore Energy Regulator (CNSOER) - Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation and Offshore Renewable Energy Management Act	Offshore renewable energy project, including energy transmission subsea cables	The application must include: <ul style="list-style-type: none"> • A detailed project description, including technical specifications and proposed activities. • Environmental Impact Assessment (EIA) or Environmental Screening Report (ESR). • Safety Management System and Emergency Response Plans. • Installation, maintenance, and decommissioning plans. • Consultation reports with Indigenous communities and stakeholders. • Compliance with marine spatial planning. • Financial assurance demonstrating the capability to meet project obligations. 	Specific timelines for the review and decision-making process are not explicitly defined in the current regulations.	<ul style="list-style-type: none"> • IA (Impact Assessment) • Fisheries and Oceans Canada (DFO) Approvals • Transport Canada Navigation Safety Approvals • Provincial/Local Permits (e.g., Coastal Zone Management) Note: Since the marine lease/licence is one of the final steps, the above permits/approvals must be completed beforehand.	
Certificate of Public Convenience and Necessity (CPCN)	Canada Energy Regulator (CER) - Canadian Energy Regulator Act (CERA); Section 262	The construction or operation of an international power line	The application must include such information as is necessary to enable the Regulator to determine whether the applicant is fit, willing, and able to carry out the proposed project and whether the project is in the public interest	Not regulated. Expected to review and make decision within 6 to 12 months depending on project complexity and information provided.	Environmental Assessment Marine and coastal approvals Provincial authorizations Marine Lease or Licence for Occupation	
Permit authorizing the construction and operation of an international power line	Canada Energy Regulator (CER) - Canadian Energy Regulator Act (CERA); Part 4 - International and Interprovincial Power Lines	A person must not construct or operate a section or part of an international power line except in accordance with a permit issued under section 248 or a certificate issued under section 262 of the CERA.	<p>On application, the Commission may issue an authorization for:</p> <p>(a) each work or activity that is proposed to be carried on, in the offshore area, in relation to an offshore renewable energy project or to an offshore power line; and</p> <p>(b) each work or activity that is proposed to be carried on to construct, operate or abandon any part of an offshore power line that is in a province.</p> <p>An application must include any information that may be required by the Regulator, or prescribed by regulation, with respect to the proposed work or activity and to the offshore renewable energy project or offshore power line, including information with respect to any facility, equipment, system or vessel related to the project or power line.</p>	Not regulated. Expected to review and make decision within 6 to 12 months depending on project complexity and information provided.	Environmental assessments under the Canadian Environmental Assessment Act. Navigation Obstruction Permit under the Navigation Protection Act. Land use agreements or leases from provincial or federal authorities. Interconnection agreements with other jurisdictions or operators.	

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
License for Electricity Export	Canada Energy Regulator (CER) - Canadian Energy Regulator Act (CERA)); Part 7, item 361	A person must not export electricity except in accordance with a permit issued under section 356 or a licence issued under section 361 of the CERA.	Before issuing a licence, the Commission must take into account whether the applicant has (i) informed those who have declared an interest in buying electricity for consumption in Canada of the quantities and classes of service available for sale, and (ii) given an opportunity to buy electricity on conditions as favourable as the conditions specified in the application to those who, within a reasonable time after being so informed, demonstrate an intention to buy electricity for consumption in Canada	Not regulated. Agency typically takes 3 to 6 months for initial decision	Permit Authorizing the Construction and Operation of an International Power Line (CERA – Part 4) Certificate of Public Convenience and Necessity (CERA – Part 3) Marine Lease or License for Occupation (CNSOER) Impact Assessment (IAAC or substituted process) Fisheries Act Authorization (DFO) Navigation Protection Act-related authorizations (Transport Canada / Canadian Coast Guard)	
Authorization under the Canadian Environmental Protection Act (CEPA)	Environment and Climate Change Canada (ECCC) - Canadian Environmental Protection Act (CEPA)	Applies to activities involving new substances, chemical emissions, or discharges that may pose environmental or human health risks.	Detailed description of the proposed project or activity, including: <ul style="list-style-type: none"> • Data on potential emissions, discharges, or releases. • Identification of the substances involved, and their characteristics. • Risk assessment data outlining potential environmental and health impacts. • Description of mitigation measures or management plans. • Information on the geographic scope of the impact. • Compliance plans for ongoing environmental protection. • Consultations with relevant stakeholders, including Indigenous communities. 	Agency Review Time: around 90 days Decision-making Time: around 180 days These are not strictly regulated and can vary depending on project complexity and need for additional information.	<ul style="list-style-type: none"> • Fisheries Act Authorization • Species at Risk Act (SARA) Authorization • Migratory Bird Convention Act (MBCA) Permit • Impact Assessment (IA) • Marine Safety Approval 	Potentially not relevant, pending detailed description of the project
Migratory Bird Convention Act (MBCA) Permit	Environment and Climate Change Canada (ECCC) - Migratory Bird Convention Act (MBCA)	Permit is required if the activity is likely to result in the incidental taking, harming, or possession of migratory birds, their eggs, or nests, or if the activity may interfere with the conservation of migratory birds	<ul style="list-style-type: none"> • Applicant Information: Full name, contact details, and any relevant affiliations. • Type of Permit Requested: Specify the nature of the permit (e.g., handling, relocation, nest removal). • Description of Proposed Activity: Detailed explanation of the activity that may affect migratory birds. • Location and Timing: Specific geographic location and the time frame during which the activity will occur. • Potential Impact Assessment: Analysis of how the activity may impact migratory birds, their nests, or eggs. • Mitigation Measures: Strategies to minimize or eliminate potential adverse effects on migratory birds. • Species Involved: Identification of migratory bird species that may be affected. • Qualifications of Personnel: Information on the experience and qualifications of individuals conducting the activity. • Supporting Documentation: Any additional documents 	Typically takes up to 90 days for initial decisions. May vary based on project complexity and specific circumstances.	<ul style="list-style-type: none"> • Species-at-risk permits • Environmental assessment approvals • Provincial or territorial wildlife permits • Construction permits 	

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
			that support the application, such as maps or environmental assessments.			
Species at Risk Act (SARA) Authorization	Environment and Climate Change Canada (ECCC) - Species at Risk Act (SARA)	To conduct an activity that may affect a listed species, its critical habitat or residences of its individuals	<ul style="list-style-type: none"> • Applicant Information: Name, contact details, and qualifications. • Activity Description: Detailed explanation of the proposed activity. • Species Affected: Identification of the species at risk involved. • Location and Timing: Specific location and dates of the activity. • Impact Assessment: Analysis of potential effects on the species and its habitat. • Mitigation Measures: Strategies to minimize adverse impacts. • Supporting Documents: Relevant plans, assessments, and permits. 	Decision to be made within 90 calendar days after notifying the applicant that the application has been received. This timeline may be extended if additional consultations are necessary or if the application is incomplete.	<ul style="list-style-type: none"> • Impact Assessments (IAs), where applicable. • Consultation with Indigenous peoples when required, especially if the project may affect lands or resources used by Indigenous groups. • Habitat Protection and Recovery Plans might be required to ensure compliance with species' recovery strategies. • Other environmental permits or approvals (e.g., Fisheries Act, Migratory Bird Convention Act) depending on the specific species and project activities. 	Marine mammals have the highest potential sensitivity with respect to the proposed sub-sea cable construction.
Impact Assessment (IA) Approval	Impact Assessment Agency of Canada (IAAC) - Impact Assessment Act (IAA), Physical Activities Regulations, Sect. 39 (a)	The construction, operation, decommissioning and abandonment of ... a new international electrical transmission line with a voltage of 345 kV or more that requires a total of 75 km or more of new right of way	<ul style="list-style-type: none"> • Detailed project description (scope, location, and components) • Potential environmental impacts and mitigation measures • Alternatives considered for the project • Consultation with Indigenous groups and stakeholders • Proposals for monitoring and follow-up programs • Plans for environmental, social, and economic assessments 	Review time: 330 days Approval time: Planning Phase: 280 days; Impact Statement Phase (Proponent): up to 4 months; Impact Assessment Phase: up to 300 days Decision Making: 30 days	<ul style="list-style-type: none"> • SARA Permit (Species at Risk Act) • Water Licenses or Permits • Marine Use and Occupation Permits • Air Quality or Emissions Permits • Land Use or Zoning Permits • Cultural Heritage Permits • Navigable Waters Protection Act Authorization • Indigenous Consultation Requirements 	Note that IAA review timelines include several potential "clock-stop" events, such as extended Indigenous Engagement or required supplementary studies. It is common for the entire process to extend up to 3 years or longer.
Navigation Obstruction Permit	Canadian Coast Guard (CCG) - Canada Shipping Act, 2001 (Part 2, Navigable Waters Protection) - Navigation Protection Act	Constructing or placing works in, on, over, under, through or across any navigable water in Canada that may interfere with navigation.	<ul style="list-style-type: none"> • Detailed description of the obstruction (project description) • Location and coordinates of the obstruction • Impact assessment on navigation • Proposed mitigation measures • Safety procedures and risk assessment • Duration and timing of the obstruction • Any other relevant information requested by the agency 	Typically around 60 days	<ul style="list-style-type: none"> • Fisheries Act authorization • Species at Risk Act authorization 	

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
Marine Safety Approval	Transport Canada -Canada Shipping Act, 2001 (Part 3, Marine Safety and Security)	Constructing, operating, or modifying a vessel, or operating a vessel in a manner that may affect the safety of navigation (for instance during construction or maintenance)	<ul style="list-style-type: none"> • Description of the vessel or installation • Location and dimensions • Risk and safety assessments • Plans for navigation and collision avoidance • Proposed mitigation measures • Duration and timing of activity • Other information as required by the agency 	Typically 6 to 12 months	<ul style="list-style-type: none"> • Impact Assessment (IA) approval • Navigation Obstruction Permit • Fisheries Act authorization • Species at Risk Act authorization 	
Fisheries Act Authorization	Fisheries and Oceans Canada (DFO) - Fisheries Act, Sect 35(1), respecting harmful alteration, disruption or destruction of fish habitat	Impacts on fish habitat caused by construction activities and disturbance of the sea floor.	<ul style="list-style-type: none"> • Detailed description of the project • Potential impact on fish or fish habitat • Mitigation measures (including development of an Offsetting Plan if fish habitat is impacted) • Timing and location of the activity • Plans for monitoring and follow-up • Other information as required by the agency 	Review time: 60 day compliance review of application followed by 90 day review leading to approval determination	<ul style="list-style-type: none"> • Impact Assessment (IA) approval • Marine Mammal Regulations Authorization • Navigational Safety Permit • Marine Safety Approval 	If an Offsetting Plan is required, this can require a significant length of time which should be considered in approval scheduling.
Marine Mammal Regulations Authorization	Fisheries and Oceans Canada (DFO) - Marine Mammal Regulations under the Fisheries Act	No person shall disturb, harm, harass, capture, or kill any marine mammal, or possess or transport any marine mammal or its parts, except in accordance with an authorization issued under these Regulations.	<ul style="list-style-type: none"> • Detailed description of the project and activities • Location and timing of the activity • Measures to minimize impacts on marine mammals • Description of monitoring and mitigation measures • Any other information required by the agency 	60 days to determine if the application is complete and to notify the applicant. - 90 days to issue the authorization or notify the applicant of refusal, starting from the date the application is deemed complete.	<ul style="list-style-type: none"> • Fisheries Act permits • Species-at-Risk Act permits • Navigable Waters Protection Act • Environmental assessments 	
Disposal at Sea Permit	Environment and Climate Change Canada (ECCC) -Canadian Environmental Protection Act – Disposal at Sea Permit (CEPA 1999; Part 7, Div.)	No person shall dispose of a substance or thing in the marine environment unless they have obtained a disposal permit issued by the Minister of the Environment.	<ul style="list-style-type: none"> • Permit may require significant data collection (sampling) at dredge and disposal sites as well as dispersion modeling and follow up monitoring • Only required if dredge material IS disposed of at sea; disposal in isolated parts of wharf developments (e.g., caissons) are likely not considered disposal at sea. 	Typically 30 to 90 days	<ul style="list-style-type: none"> • Impact Assessment (IA) approval • Marine Mammal Regulations Authorization • Fisheries Act Authorization • Navigational Safety Permit 	Could be required depending on construction methods
Province - Nova Scotia						
Environmental Assessment (Class I)	Nova Scotia Department of Environment and Climate Change -Environmental Assessment Regulations, Environment Act	EA Approval likely required for the proposed undertaking as a Class 1 Category D. (Energy), specifically: 1. A corridor for 1 or more electric power transmission lines that have a cumulative voltage rating equal to or greater than 345 kVA	<ul style="list-style-type: none"> • Description of the proposed undertaking • Description of the existing environment • Prediction of potential environmental effects • Plans to mitigate adverse effects • Monitoring and follow-up plans • Public consultation details • Other information as required by the Minister 	50 days, following submission of a complete registration package	<ul style="list-style-type: none"> • Fisheries Authorization • Marine Mammal Regulation Authorization • Navigation Obstruction Permit • Other federal or provincial permits depending on the project scope 	If CNSOER can't lead the project, it is possible both federal and provincial processes might be required

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
Wetland Alteration Permit	Nova Scotia Department of Environment and Climate Change -NSEA Part V- Activities Designation Regulations, Division 1 – Water (Wetland Alteration)	Wetland habitat alteration / infill: • Site development	<ul style="list-style-type: none"> • Description of the proposed activity • Location of the activity • Area and extent of the water or wetland to be altered • Description of potential environmental impacts • Proposed mitigation measures • Information related to any potential impacts on species or habitat • Any other information requested by the agency 	60 days	Environmental Assessment and conditions of approval (if applicable)	Potentially needed, depending on project details for the interconnection on land
Watercourse Alteration Permit	Nova Scotia Department of Environment and Climate Change -NSEA Part V- Activities Designation Regulations, Division 1 – Water (Watercourse Alteration)	Watercourse alteration / infill: • Site development	<ul style="list-style-type: none"> • Standard Application Form, including site characteristics, proposed mitigation, offsetting plan if habitat is displaced • DFO would be referred for review of the application during the NSECC approval process. DFO would provide a letter of advice to NSECC, typically including specifications for in-water works and installations. DFO could request additional information about the design or existing habitat characterization. If fish habitat offsetting/compensation is needed, then an application for DFO Fisheries Authorization under the Fisheries Act is likely required 	60 days (without DFO Authorization)	Environmental Assessment and conditions of approval (if applicable)	Potentially needed, depending on project details for the interconnection on land
Risk Management Plan (if applicable)	Nova Scotia Department of Environment and Climate Change -Nova Scotia Environment Act (NSEA); Contaminated Sites Regulations	Potential interaction with historic mining related contamination (earthworks)	No approval but compliance required (Phase 1 and 2 Site Assessment; Risk Management Plan)	Site-specific, up to 1 yr	NA	Potentially needed, depending on project details for the interconnection on land. The NS southern shore has a history of gold mining which should be considered in site selection.
Environmental Protection Plan	Nova Scotia Department of Environment and Climate Change -Nova Scotia Endangered Species Act	Potential interaction with provincially listed endangered species	No approval but compliance required (avoid impacts on endangered species; Environmental Protection Plan)	NA	NA	
Work within Highway Right-of-Way Permit	Nova Scotia Department of Public Works -Public Highways Act	Create new access from public roads or road realignment (if applicable)	Routine application form	Estimate: max 60 days; not legislated; to be determined in consultation with Dept	<ul style="list-style-type: none"> • Environmental Assessment • Crown Land Permit, if applicable • Municipal Permits • Traffic Control/Access Permits 	Potentially needed, depending on project details for the interconnection on land
Crown Land Lease	Nova Scotia Department of Natural Resources -Crown Lands Act	Provincial land lease	<ul style="list-style-type: none"> • Cabinet approval has an extended timeline (6 months+) 	Estimate: 180 + days Not legislated; to be determined in consultation with NSNR	Environmental Assessment and conditions of approval (if applicable)	Potentially needed, depending on project details for the interconnection on land

Permit/Approval	Responsible Agency & Underlying Regulation	Applicability/Trigger Threshold	Application Submission Requirements & Information Required for Approval	Agency Review & Decision-making Time	Potential Dependencies with respect to other permits or conditions	Comments
Crown Land Permit (Permit to Construct)	Nova Scotia Department of Natural Resources -Crown Lands Act	Marine cable construction in the shoreline	<ul style="list-style-type: none"> • Description of the proposed construction • Location and map of the site • Information about the purpose of the construction • Environmental impact assessment (if required) • Impact on surrounding Crown land and resources • Proposed mitigation measures • Evidence of consultation with affected parties (if applicable) • Proof of land tenure or permission to access the site • Any additional information requested by the agency 	Estimate: 180 + days Not legislated; to be determined in consultation with NSNR	Environmental Assessment and conditions of approval (if applicable)	Potentially needed, depending on project details for the interconnection on land
Archaeological License	Nova Scotia Department of Communities, Culture, Tourism, and Heritage -Special Places Protection Act (1989) and associated guidelines	Clearance for ground disturbance (i.e., protection of archaeological features).	• The lands for the proposed converter station are likely zoned “RE” (Rural Resource Zone) (Halifax Regional Planning Strategy / Regional Plan – Eastern Shore (West) Plan Area); to permit the proposed industrial use with an amendment of the Zoning By-Law / Rezoning is likely required	Estimate: 60 days; not legislated; to be determined in consultation with Dept;	<ul style="list-style-type: none"> • Environmental Assessment • Cultural Resource Management • Consultation with Indigenous Groups 	
Rezoning Bylaw Amendment	Halifax Regional Municipality -Municipal Governing Act / Halifax Regional Municipality Charter	Change municipal land use type	• The lands for the proposed converter station are likely zoned “RE” (Rural Resource Zone) (Halifax Regional Planning Strategy / Regional Plan – Eastern Shore (West) Plan Area); to permit the proposed industrial use with an amendment of the Zoning By-Law / Rezoning is likely required	Not prescribed; up to 1 year	<ul style="list-style-type: none"> • Development Permit • Environmental Assessment • Building Permit • Heritage Permit • Subdivision Approval • Traffic Impact Assessment • Public Consultation Requirements 	Potentially needed, depending on project details for the interconnection on land
Development/Building Permit	Halifax Regional Municipality -Municipal Governing Act / Halifax Regional Municipality Charter	<ul style="list-style-type: none"> • Development Permit for changes in site use • Building Permit for structures designed for human entry/occupation. 	<ul style="list-style-type: none"> • Description of the proposed construction • Location and map of the site • Information about the purpose of the construction • Environmental impact assessment (if required) • Impact on surrounding Crown land and resources • Proposed mitigation measures • Evidence of consultation with affected parties (if applicable) • Proof of land tenure or permission to access the site • Any additional information requested by the agency 	Not prescribed; up to 1 yr	Environmental Assessment and conditions of approval (if applicable)	Potentially needed, depending on project details for the interconnection on land

B DEMOGRAPHIC INFORMATION FOR THE PROVINCE OF NOVA SCOTIA NOVA SCOTIA

This appendix includes demographic information for the Province of Nova Scotia.

AGE, GENDER, POPULATION GROWTH

Age, gender, and population growth are core demographic indicators that help describe the structure and dynamics of a population, informing planning, policy, and service delivery.

- Age refers to the number of years since birth, typically grouped into cohorts such as 0–14 (children), 15–64 (working-age), and 65+ (seniors). It is used to assess population aging, dependency ratios, and future service needs.
- Gender refers to the gender identity reported by individuals, including men, women, and gender-diverse people. It is used to analyze demographic trends, labour force participation, and social outcomes.
- Population growth measures the change in the number of residents over time, influenced by births, deaths, and migration. It is expressed as a percentage change between census periods and is a key indicator of regional development and demographic pressure.

Table B-1: Presents the average and median ages for the Province of Nova Scotia. According to the 2021 Census, there were 969,380 individuals living in the Province of Nova Scotia, of which 471,730 identified as men+ and 497,650 identified as women+.³⁴ The Province of Nova Scotia's population increased by 5.0% between the 2016 Census and 2021 Census (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

The average age in 2021 was 44.2 years (43.2 for men+ and 45.2 for women+), and the median age was 45.6 years (44.4 for men+ and 46.8 for women+). The average age increased by 0.7 years and the median age increased by 0.1 years between 2016 and 2021 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

³⁴ Statistics Canada uses the terms "men+" and "women+" in its two-category gender variable to include both cisgender and transgender individuals. Specifically, "men+" includes cisgender and transgender men, while "women+" includes cisgender and transgender women. In some cases, certain non-binary individuals are also included in these categories to protect confidentiality.

Table B-1: Nova Scotia Average and Median Age, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/Males (%)	Women+/Females (%)
Total Population	969,380	471,730	497,650	923,600	446,885	476,715	5	5.6	4.4
0 to 14 years	136,710	70,165	66,540	133,825	68,370	65,455	2.2	2.6	1.7
15 to 64 years	617,345	302,720	314,625	605,950	295,100	310,845	1.9	2.6	1.2
65 years and over	215,325	98,845	116,480	183,820	83,415	100,405	17.1	18.5	16
Average Age	44.2	43.2	45.2	43.5	42.5	44.4	0.7	0.7	0.8
Median Age	45.6	44.4	46.8	45.5	44.5	46.4	0.1	-0.1	0.4

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

MIGRATION AND MOBILITY

Migration and mobility refer to the movement of individuals within or between geographic areas over a specific period. Statistics Canada distinguishes:

- Mobility: Whether individuals have changed residence within the past year or five years, including moves within the same province, between provinces, or from outside Canada.
- Migration: A subset of mobility, focusing on interprovincial and international moves.

These indicators help assess population shifts, regional growth, housing demand, and service needs across communities.

Table B-2 presents relevant 2021 Census data regarding migration and mobility for the Province of Nova Scotia.³⁵ According to the 2021 Census, 87.8% of individuals living in the Province of Nova Scotia did not move in the previous year (87.8% of men+ and 87.8% of women+), a 0.2% decrease from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

In the 2021 Census, 1.9% of individuals living in the Province of Nova Scotia moved within the province in the previous year (1.8% of men+ and 1.9% of women+), a 0.2% decrease from 2016. Additionally, 2.4% of individuals reported moving into Nova Scotia from a different province in the previous year (2.5% of men+ and 2.4% of women+), a 0.7% increase from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

³⁵ Refers to the status of a person with regard to the place of residence on the reference day, May 11, 2021, in relation to the place of residence on the same date one year earlier at the provincial level. Persons who have not moved are referred to as non-movers and persons who have moved from one residence to another are referred to as movers. Movers include non-migrants and migrants. Non-migrants are persons who did move but remained in the same city, town, township, village or Indian reserve. Migrants include internal migrants, who moved to a different city, town, township, village or Indian reserve within Canada. External migrants include persons who lived outside Canada at the earlier reference date.

Table B-2: Nova Scotia Mobility Characteristics, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/Males (%)	Women+/Females (%)
Mobility (25% sample data)									
Total responses	948,430	461,880	486,545	900,450	436,790	463,660	5.3	5.7	4.9
Did not move in the past year (%)	87.8	87.8	87.8	88	88	87.9	-0.2	-0.2	-0.1
Moved within Nova Scotia (%)	1.9	1.8	1.9	2.1	1.9	2.2	-0.2	-0.1	-0.3
Moved into Nova Scotia from a different province (%)	2.4	2.5	2.4	1.7	1.8	1.6	0.7	0.7	0.8

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

IMMIGRATION

Immigration refers to individuals who are or have been granted the legal right to live in Canada permanently, including those born outside the country. Statistics Canada categorizes immigration status as:

- Immigrants: Persons who have been granted permanent resident status.
- Non-permanent residents: Individuals with temporary status, such as international students, temporary foreign workers, or asylum seekers.

Census data also tracks place of birth for the immigrant population, helping to assess demographic diversity, regional origins, and changes in immigration patterns over time.

Table B-3 presents relevant 2021 Census immigration data for the Province of Nova Scotia. According to the 2021 Census, 7.5% of individuals living in the Province of Nova Scotia were immigrants (7.6% of men+ and 7.4% of women+), representing a 1.4% increase from 2016. Additionally, 2.3% of individuals were non-permanent residents (2.7% of men+ and 2.0% of women+), a 1.2% increase from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

In terms of place of birth among the immigrant population, 40.4% were born in Asia (40.0% of men+ and 40.9% of women+), a 6.4% increase from 2016. 32.6% were born in Europe (32.8% of men+ and 32.3% of women+), a 7.1% decrease from 2016. 17.0% were born in the Americas (16.3% of men+ and 17.6% of women+), a 2.1% decrease from 2016. 9.2% were born in Africa (10.0% of men+ and 8.4% of women+), a 2.9% increase from 2016. A small proportion, 0.8%, were born in Oceania (0.9% of men+ and 0.7% of women+), a slight 0.1% decrease from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-3: Nova Scotia Immigration Characteristics, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/Males (%)	Women+/Females (%)
Immigration (25% sample data)									
Total responses	955,860	465,855	490,000	908,340	440,730	467,605	5.2	5.7	4.8
Immigrants (%)	7.5	7.6	7.4	6.1	6.2	6.1	1.4	1.4	1.3
Non-permanent residents (%)	2.3	2.7	2	1.1	1.3	0.9	1.2	1.4	1.1
Places of Birth for the Immigrant Population									
Americas (%)	17	16.3	17.6	19.1	17.7	20.3	-2.1	-1.4	-2.7
Europe (%)	32.6	32.8	32.3	39.7	41.1	38.4	-7.1	-8.3	-6.1
Africa (%)	9.2	10	8.4	6.3	6.8	5.9	2.9	3.2	2.5
Asia (%)	40.4	40	40.9	34	33.4	34.7	6.4	6.6	6.2
Oceania (%)	0.8	0.9	0.7	0.9	1.1	0.6	-0.1	-0.2	0.1

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

RACIALIZED POPULATION / VISIBLE MINORITY

Visible minority refers to whether a person belongs to a group identified as a visible minority under the Employment Equity Act. This Act defines visible minorities as persons who are not Indigenous and who are non-Caucasian in race or non-white in colour. The visible minority population includes groups such as South Asian, Chinese, Black, Filipino, Arab, Latin American, Southeast Asian, West Asian, Korean, and Japanese. In the 2021 Census, Statistics Canada replaced the term visible minority with racialized population or racialized groups in its analysis and communications, reflecting broader public usage of these terms (Statistics Canada, 2017).

Table B-4 presents relevant 2021 Census data on visible minority populations in the Province of Nova Scotia. According to the 2021 Census, 4.4% of individuals in Nova Scotia identified as part of a visible minority group (4.7% of men+ and 4.0% of women+), representing a 1.2% increase from 2016. The most represented racialized populations were Black individuals (3.0%), followed by South Asian individuals (2.3%), and Chinese individuals (1.2%). The proportion of individuals not identifying as a visible minority was 95.6% (95.3% of men+ and 96.0% of women+), a 1.2% decrease from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-4: Nova Scotia Racialized Population Characteristics, Census 2016 and 2021

Census Indicators	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Men+	Women+	Total	Men+	Women+
Total - Visible minority for the population in private households - 25% sample data	51,455	24,900	26,560	50,370	24,255	26,120	2.2	2.7	1.7
Visible minority (%)	4.4	4.7	4	3.2	3.2	3.3	1.2	1.5	0.7
Not a visible minority (%)	95.6	95.3	96	96.8	96.8	96.7	-1.2	-1.5	-0.7

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

LANGUAGE

Language refers to the ability to communicate in and use specific languages, as measured by several indicators in the census:

- Knowledge of Official Languages: Identifies whether individuals can conduct a conversation in English, French, or both.
- Language Spoken Most Often at Home: Indicates the primary language used in daily life within the household.
- Indigenous Languages: Tracks the use of Indigenous languages spoken most often at home, reflecting cultural and linguistic diversity.

These indicators help assess linguistic composition, bilingualism, and cultural identity within the population.

The table B-5 presents relevant 2021 Census language data for the Province of Nova Scotia. According to the 2021 Census, 89.3% of individuals living in the Province of Nova Scotia reported knowing only English (90.4% of men+ and 88.3% of women+), a slight increase from 2016. A smaller number of respondents (10.3% total; 9.3% of men+ and 11.3% of women+) reported knowing both French and English in the 2021 Census, a small decrease from 2016. In the 2021 Census, 0.1% reported knowing only French, unchanged from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

In the 2021 Census, a majority of the Province of Nova Scotia residents (93.4%) reported speaking English most often at home, a 1.3% decrease from 2016; 1.3% reported speaking French most often at home, a 0.3% decrease from 2016; and 0.2% reported speaking Indigenous languages most often at home in 2021, a 0.1% decrease from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-5: Nova Scotia Language Characteristics, Census 2016 and 2021

Languages Spoken Most Often at Home	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Men+	Women+	Total	Men+	Women+
Total responses	958,990	467,355	491,635	912,300	442,470	469,830	5.1	5.6	4.6
Indigenous languages spoken most often at home (%)	0.2	0.2	0.2	0.3	0.3	0.3	-0.1	-0.1	-0.1
English spoken most often at home (%)	93.4	93.2	93.6	94.7	94.5	94.8	-1.3	-1.3	-1.2
French spoken most often at home (%)	1.3	1.3	1.4	1.6	1.6	1.6	-0.3	-0.3	-0.2

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

EDUCATIONAL ATTAINMENT

Educational attainment refers to the highest level of formal education completed by individuals aged 15 years and over. It includes categories such as:

- No certificate, diploma, or degree
- High school diploma or equivalency
- Apprenticeship or trades certificate or diploma
- College or non-university certificate or diploma
- University certificate below bachelor level
- Bachelor's degree or higher

These categories are used to assess skills, qualifications, and workforce readiness, and to analyze educational trends, gender differences, and regional disparities in education levels.

The Table B-6 presents relevant 2021 Census educational attainment data for the Province of Nova Scotia. According to the 2021 Census, 16.8% of the total population aged 15 years and over did not have a certificate, diploma, or degree (18.5% of men+ and 15.2% of women+), representing a 3.0% decrease from 2016 overall (2.9% decrease for men+ and 3.2% decrease for women+) (Government of Canada, Statistics Canada, 2022; 2017).

In 2021, 26.9% of the population aged 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (27.5% of men+ and 26.3% of women+), a 1.9% increase over 2016 for men+ and a 1.3% increase for women+. 8.6% reported an apprenticeship or trades certificate or diploma (12.7% of men+ and 4.7% of women+), a 1.8% decrease from 2016 for men+ and a 1.0% decrease for women+. 21.2% reported a college or non-university certificate (17.8% of men+ and 24.4% of women+), a 0.2% decrease from 2016 for men+ and a 0.9% decrease for women+. Finally, 24.3% reported a bachelor's degree or higher (21.5% of men+ and 26.8% of women+), a 2.9% increase over 2016 for men+ and a 4.0% increase for women+ (Government of Canada, Statistics Canada, 2022; 2017).

Table B-6: Nova Scotia Education Characteristics, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	819,315	395,805	423,510	774,745	372,455	402,295	5.8	6.3	5.3
No certificate; diploma; degree (%)	16.8	18.5	15.2	19.8	21.4	18.4	-3	-2.9	-3.2
Secondary (high) school diploma or equivalency certificate (%)	26.9	27.5	26.3	25.3	25.6	25	1.6	1.9	1.3
Apprenticeship or trades certificate or diploma (%)	8.6	12.7	4.7	9.9	14.5	5.7	-1.3	-1.8	-1
College, or non university certificate (%)	21.2	17.8	24.4	21.8	18	25.3	-0.6	-0.2	-0.9
University certificate below bachelor level (%)	2.3	1.9	2.7	2.4	1.9	2.8	-0.1	0	-0.1
Bachelor's degree or higher (%)	24.3	21.5	26.8	20.8	18.6	22.8	3.5	2.9	4

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

HOUSING

Housing refers to private dwellings where individuals or households reside, including both owner-occupied and rental units. Key housing indicators include:

- Dwelling Type and Occupancy: Total number of private dwellings and those occupied by usual residents.
- Tenure: Whether a household owns or rents its dwelling, including housing provided by local governments or First Nations bands.
- Suitability and Condition: Whether housing is suitable for the household size and whether it requires regular or major repairs.
- Affordability: Measured by the proportion of income spent on shelter costs,³⁶ with housing considered unaffordable if more than 30% of income is spent.

These indicators help assess housing availability, quality, and affordability, and are used to monitor housing needs and trends across Canada.

The Table B-7 presents relevant 2021 Census housing data for the Province of Nova Scotia. According to the 2021 Census, there were 476,007 private dwellings in the Province of Nova Scotia, of which 90.0% were occupied by the usual residents. The average dwelling housed 2.2 persons, a slight decrease from 2016. In 2021, 66.8% of respondents were owners of their household, 32.6% were renters, and 0.7% were living in a household provided by the local government or a First Nation band (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

With regards to household conditions, 96.4% of respondents reported their household as being suitable, 91.8% of households were in need of only regular maintenance and minor repairs, and 8.2% of households were in need of major repairs. With regards to household affordability, 82.1% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 3.7% increase over 2016; and 17.9% reported spending more than 30% of their income on shelter costs, a 3.7% decrease from 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

³⁶ Shelter cost refers to the average monthly total of all shelter-related expenses paid by a household. For owner households, this includes mortgage payments, property taxes, condominium fees, and the costs of electricity, heat, water, and other municipal services. For renter households, it includes rent and the same utility costs. For households in dwellings provided by a local government, First Nation, or Indian band, it includes monthly use or occupancy payments and utility costs

Table B-7: Nova Scotia Housing Characteristics, Census 2016 and 2021

Characteristic	2021	2016	Change from 2016 to 2021
Private Dwellings (25% sample data)	Total	Total	Total (%)
Total private dwellings	476,007	458,568	3.8
Private dwellings occupied by usual residents	428,228	401,990	6.5
Private dwellings occupied by usual residents (%)	90	87.7	2.3
Average household size (persons)	2.2	2.3	-0.1
Household Tenure			
Private household by tenure: Owner (%)	66.8	68.7	-1.9
Private household by tenure: Renter (%)	32.6	30.7	1.9
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	0.7	0.6	0.1
Household Conditions			
Housing is suitable (%)	96.4	97.1	-0.7
Housing is not suitable (%)	3.6	2.9	0.7
Dwelling in need of only regular maintenance and minor repairs (%)	91.8	91.2	0.6
Dwelling in need of major repairs (%)	8.2	8.8	-0.6
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	82.1	78.4	3.7
Owner or tenant spending more than 30% of income on shelter costs (%)	17.9	21.6	-3.7

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

Table B-8 presents 2021 Census data on dwelling values and shelter costs for the Province of Nova Scotia. According to the Census, the median value of dwellings in Nova Scotia was \$250,000, while the average value was \$295,600 (Government of Canada, Statistics Canada, 2022).

For owned dwellings, the median monthly shelter cost was \$870, and the average monthly shelter cost was \$1,070. For rented dwellings, the median monthly shelter cost was \$1,000, while the average monthly shelter cost was \$1,083 (Government of Canada, Statistics Canada, 2022).

Table B-8: Nova Scotia Dwelling Values and Shelter Costs, Census 2021

Values of Dwellings and Shelter Costs	Nova Scotia
Median value of dwellings (\$)	250,000
Average value of dwellings (\$)	295,600
Median monthly shelter costs for owned dwellings (\$)	870
Average monthly shelter costs for owned dwellings (\$)	1,070
Median monthly shelter costs for rented dwellings (\$)	1000
Average monthly shelter costs for rented dwellings (\$)	1083

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

LABOUR FORCE CHARACTERISTICS

This section provides labour force characteristics and economic sector overviews for the Province of Nova Scotia, including:

- Participation and unemployment;
- Labour supply; and,
- Income.

Key labour force characteristic insights are outlined in [Table 7-2](#).

Table B-9: Summary Insights Social and Demographic Characteristics

Characteristic	Relevant Demographic Insights
Participation and unemployment	<ul style="list-style-type: none"> → Labour Force Participation Challenges: The participation rate declined to 59.5% between 2016 and 2021, with a notable drop among women+, which may suggest potential barriers to workforce engagement that may affect local hiring for OSW projects. → High Unemployment Rate: The unemployment rate rose to 12.7% between 2016 and 2021, which may indicate a potential pool of available labour that could benefit from targeted training and employment opportunities in the OSW sector.
Labour Supply	<ul style="list-style-type: none"> → Strong Base in Construction and Trades: Construction was the leading industry for men+, and trades and transport occupations were the top occupation group in 2021—indicating the local workforce may have relevant skills for OSW construction and services. → Gendered Industry Participation: Women+ were concentrated in health care, education, and service sectors in 2021, which may suggest the need for targeted outreach and training to support more inclusive participation in OSW-related roles.
Income	<ul style="list-style-type: none"> → Stable Labour Market: Men+ and women+ in Nova Scotia increased their employment income between 2016 and 2021, with women+ showing stronger growth in both median and average earnings. Rising incomes often correlate with higher educational attainment and labour market stability—factors that align with workforce readiness for large-scale infrastructure projects like OSW

Characteristic	Relevant Demographic Insights
	<p>→ Strengthening Gender Representation: More women+ entered full-year full-time work, increasing by 6.0%, which strengthened gender representation in stable employment. This shift can help diversify the OSW labour force and may support inclusive hiring practices in OSW.</p> <p>→ Shifts in Income Composition: The increase in government transfers may be linked to demographic changes, particularly the aging population and the resulting growth in the number of retirees. This shift likely contributes to higher reliance on income supports such as public pensions. At the same time, rising unemployment during the same period may also explain part of the increase in transfers, through programs such as Employment Insurance. Understanding these shifts is important for planning inclusive employment strategies and ensuring that income support systems remain responsive to evolving needs.</p>

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

PARTICIPATION AND UNEMPLOYMENT RATES

Participation and employment rates are used to assess labour market performance, economic inclusion, and regional or demographic disparities in employment.

- Participation rate refers to the percentage of the working-age population (15 years and older) that is actively engaged in the labour market, either by working or actively seeking work. It reflects the extent of labour force involvement in the economy.
- Unemployment rate refers to the percentage of the labour force that is unemployed and actively seeking employment. It is a key indicator of labour market health and economic conditions.

→ Employment rate refers to the percentage of the working-age population (15 years and older) that is currently employed. It provides a measure of how many people are working relative to the total population that could potentially be working.

Table B-10 presents relevant 2021 Census labour force data for the Province of Nova Scotia. According to the 2021 Census, the labour force participation rate was 59.5% total (63.1% for men+ and 56.1% for women+), a 2.1% decrease from 2016 for men+ and a 1.5% decrease from 2016 for women+ (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

The unemployment rate in 2021 was 12.7% total (12.3% for men+ and 13.1% for women+), a 0.9% increase from 2016 for men+ and a 4.7% increase over 2016 for women+ (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-10: Nova Scotia Labour Force Status

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/Males (%)	Women+/Females (%)
Labour Force Status									
Population 15+ Years	819,315	395,805	423,510	774,750	372,455	402,290	5.8	6.3	5.3
In the labour force	487,260	249,805	237,455	474,595	242,775	231,820	2.7	2.9	2.4
Employed	425,190	218,955	206,235	427,310	215,010	212,305	-0.5	1.8	-2.9
Unemployed	62,070	30,845	31,225	47,280	27,765	19,520	31.3	11.1	60
Not in the labour force	332,055	146,005	186,050	300,155	129,680	170,475	10.6	12.6	9.1
Participation rate (%)	59.5	63.1	56.1	61.3	65.2	57.6	-1.8	-2.1	-1.5

Characteristic	2021			2016			Change from 2016 to 2021		
Employment rate (%)	51.9	55.3	48.7	55.2	57.7	52.8	-3.3	-2.4	-4.1
Unemployment rate (%)	12.7	12.3	13.1	10	11.4	8.4	2.7	0.9	4.7

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

LABOUR SUPPLY

Labour supply refers to the total number of individuals available and willing to work, including those who are employed and those who are actively seeking employment (unemployed), typically measured through the labour force. It reflects the working-age population’s participation in the labour market and is influenced by factors such as demographics, education, migration, and economic conditions. Labour supply is a key component in assessing labour market balance and workforce availability.

WORKFORCE BY INDUSTRY

Workforce by industry refers to the distribution of employed individuals across different sectors of the economy, as defined by the North American Industry Classification System (NAICS). Industries include sectors such as health care and social assistance, retail trade, construction, manufacturing, education, and public administration, among others. This classification helps analyze economic structure, employment trends, and sector-specific labour dynamics within a region or population.

Table B-11 illustrates the 2016 and 2021 Census breakdown of the Province of Nova Scotia’s workforce by industry. According to the 2021 Census, construction was the dominant industry for men+, followed by manufacturing and retail trade. The dominant industry for women+ was health care and social assistance, followed by educational services and retail trade (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-11: Nova Scotia Workforce by Industry, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total (%)	Men+ (%)	Women+ (%)	Total (%)	Males (%)	Females (%)	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Workforce by Industry									
Agriculture, forestry, fishing and hunting	3.7	5.6	1.7	3.7	5.8	1.6	0	-0.2	0.1
Mining, quarrying, and oil and gas extraction	0.6	1.1	0.1	0.8	1.5	0.2	-0.2	-0.4	-0.1
Utilities	0.8	1.1	0.4	0.6	0.9	0.3	0.2	0.2	0.1
Construction	7.3	12.7	1.7	7.1	12.4	1.5	0.2	0.3	0.2
Manufacturing	6.4	9.1	3.5	6.8	9.7	3.8	-0.4	-0.6	-0.3
Wholesale trade	2.3	3.3	1.4	2.8	4	1.6	-0.5	-0.7	-0.2
Retail trade	12.1	10.8	13.5	12.6	10.8	14.4	-0.5	0	-0.9
Transportation and warehousing	4.1	6.2	1.9	4.1	6.2	2	0	0	-0.1

Characteristic	2021			2016			Change from 2016 to 2021		
Information and cultural industries	1.7	1.9	1.5	2	2.2	1.7	-0.3	-0.3	-0.2
Finance and insurance	3.4	2.6	4.2	3.2	2.3	4.1	0.2	0.3	0.1
Real estate and rental leasing	1.3	1.4	1.3	1.4	1.6	1.3	-0.1	-0.2	0
Professional, scientific and technical services	6.4	7	5.9	5.5	5.8	5.2	0.9	1.2	0.7
Management of companies and enterprises	0.1	0.1	0.2	0.1	0.1	0.2	0	0	0

Characteristic	2021			2016			Change from 2016 to 2021		
Administrative and support, waste management and remediation services	4.4	5.2	3.6	4.7	5.3	4	-0.3	-0.1	-0.4
Educational services	7.9	4.7	11.3	7.5	4.8	10.3	0.4	-0.1	1
Health care and social assistance	14.5	5.1	24.4	13.6	4.3	23.3	0.9	0.8	1.1
Arts, entertainment and recreation	1.9	1.8	1.9	2	1.9	2.1	-0.1	-0.1	-0.2
Accommodation and food services	6.2	5.1	7.3	7	5	9.1	-0.8	0.1	-1.8
Other services (except public administration)	4	3.7	4.2	4	3.7	4.5	0	0	-0.3

Characteristic	2021			2016			Change from 2016 to 2021		
Public administration	8.6	9.4	7.8	8.5	9.7	7.2	0.1	-0.3	0.6

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

WORKFORCE BY OCCUPATION

Workforce by occupation refers to the distribution of employed individuals across different types of jobs or occupational categories, as classified by the National Occupational Classification (NOC) system. This includes broad categories such as trades, transport, and equipment operators; sales and service; business, finance and administration; health; education; and natural sciences, among others. It is used to analyze labour market trends, gender representation, and economic structure within a region or population.

Table B-12 illustrates the 2016 and 2021 Census breakdown of the Province of Nova Scotia’s workforce by occupation. According to the 2021 Census, the dominant occupation category for men+ was trades, transport and equipment operators and related occupations, followed by sales and service occupations. The dominant occupation category for women+ was sales and service occupations, followed by business, finance and administration occupations (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-12: Nova Scotia Workforce by Occupation, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
Workforce by Occupation	Total (%)	Men+ (%)	Women+ (%)	Total (%)	Males (%)	Females (%)	Total (%)	Men+/ Males (%)	Women+/ Females (%)

Characteristic	2021			2016			Change from 2016 to 2021		
Legislative and senior management occupations	1	1.3	0.8	9.6	11.2	7.9	-8.6	-9.9	-7.1
Business, finance and administration occupations	15	8.5	21.9	14.2	7.4	21.4	0.8	1.1	0.5
Natural and applied sciences and related occupations	6.7	9.9	3.3	5.8	9.1	2.4	0.9	0.8	0.9
Health occupations	9.3	3.2	15.8	7.9	2.6	13.5	1.4	0.6	2.3
Occupations in education, law and social, community and government services	13.6	9.6	17.8	12.3	8.6	16	1.3	1	1.8

Characteristic	2021			2016			Change from 2016 to 2021		
Occupations in art, culture, recreation and sport	2.7	2.3	3.1	2.6	2.3	3	0.1	0	0.1
Sales and service occupations	25.3	21.4	29.3	23.8	18.7	29.2	1.5	2.7	0.1
Trades, transport and equipment operators and related occupations	16.6	29.9	2.6	14.2	26.4	1.5	2.4	3.5	1.1
Natural resources, agriculture and related production occupations	3.6	5.9	1.3	3.9	6.5	1.1	-0.3	-0.6	0.2
Occupations in manufacturing and utilities	3.9	5.7	2	3.7	5.3	2	0.2	0.4	0

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

INCOME

Income refers to the total monetary resources received by individuals or households from various sources, including employment earnings, government transfers, pensions, investments, and other private sources. It is commonly measured as market income, total income, or after-tax income, and is used to assess economic well-being, poverty levels, and income distribution across populations.

SOURCES OF INCOME

Sources of income refer to the origins of monetary earnings received by individuals or households. According to Statistics Canada, these are typically grouped into:

- Market Income: Includes earnings from employment, self-employment, investments, private retirement income, and other private sources.
- Employment Income: A subset of market income, this includes wages, salaries, and net self-employment income.
- Government Transfers: Includes public income supports such as Employment Insurance, Old Age Security, Canada Pension Plan, social assistance, and other government benefits.

Table B-13 presents relevant 2021 Census income composition data for the Province of Nova Scotia. According to the 2021 Census, employment income accounted for 62.3% of total income in the Province of Nova Scotia (65.4% for men+ and 58.5% for women+), a 4.3% decrease from 2016 for men+ and a 4.8% decrease from 2016 for women+ (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Government transfers accounted for 21.0% of total income (17.2% for men+ and 25.5% for women+), a 4.9% increase over 2016 for men+ and a 6.2% increase over 2016 for women+ (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-13: Nova Scotia Sources of Income, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/Males (%)	Women+/Females (%)
Income Composition									
Market Income (%)	79	82.8	74.6	84.6	87.7	80.7	-5.6	-4.9	-6.1
Employment Income (%)	62.3	65.4	58.5	66.9	69.7	63.3	-4.6	-4.3	-4.8
Government Transfers (%)	21	17.2	25.5	15.4	12.3	19.3	5.6	4.9	6.2

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

EMPLOYMENT INCOME

Employment income refers to earnings from paid work, including wages, salaries, and net self-employment income, received by individuals aged 15 and over. It is a key component of market income and is used to assess labour market conditions, income distribution, and gender disparities.

Table B-14 presents relevant 2021 Census employment income data for the Province of Nova Scotia. According to the 2021 Census, the median employment income was \$59,600 for full-year full-time men+ workers, a 10.8% increase over 2016, and \$48,000 for full-year full-time women+ workers, a 13.6% increase over 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

In the 2021 Census, the average employment income was \$69,000 for full-year full-time men+ workers, an 8.0% increase over 2016, and \$55,050 for full-year full-time women+ workers, a 13.0% increase over 2016 (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017).

Table B-14: Nova Scotia Employment Income, Census 2016 and 2021

Characteristic	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Income Statistics									
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	260,795	139,605	121,190	245,425	131,095	114,325	6.3	6.5	6.0
Median employment income in 2020 (Full-year full-time workers) (\$)	53,600	59,600	48,000	47,665	53,785	42,236	12.5	10.8	13.6
Average employment income in 2020 (Full-year full-time workers) (\$)	62,500	69,000	55,050	56,820	63,886	48,717	10	8	13.0

Source: (Government of Canada, Statistics Canada, 2022) (Government of Canada, Statistics Canada, 2017)

C SUMMARY OF NOVA SCOTIA MUNICIPAL SURVEY 2025 RESULTS

Summary of Survey Results

Net Zero Atlantic and WSP surveyed municipal representatives on their views of a subsea cable and additional OSW buildout in terms of potential socio-economic effects and labour force readiness. Municipal representatives were asked via email to complete this survey based on their knowledge in their professional capacity with the municipality. The survey was online from June 24th to July 11th, 2025. Twenty-two municipal representatives responded. Survey results helped to inform interview findings and secondary research.

Question 1

Municipal representatives were asked if they represent a coastal community. Most respondents (19/22) responded yes, three responded no (3/22) as shown in Figure C-1.

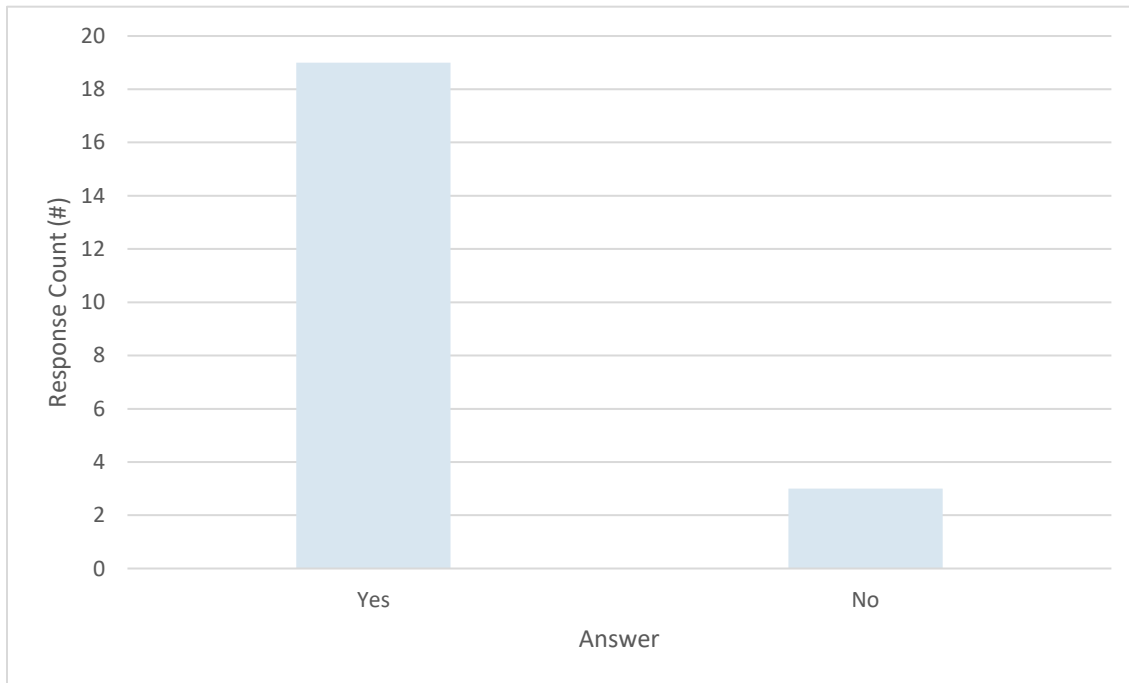


Figure C-1 Coastal Community Respondents, Nova Scotia Municipal Survey 2025

Question 2

Municipal representatives were asked if they represent a rural community. Most respondents (20/22) responded yes, two responded no (2/22) as shown in Figure C-2.

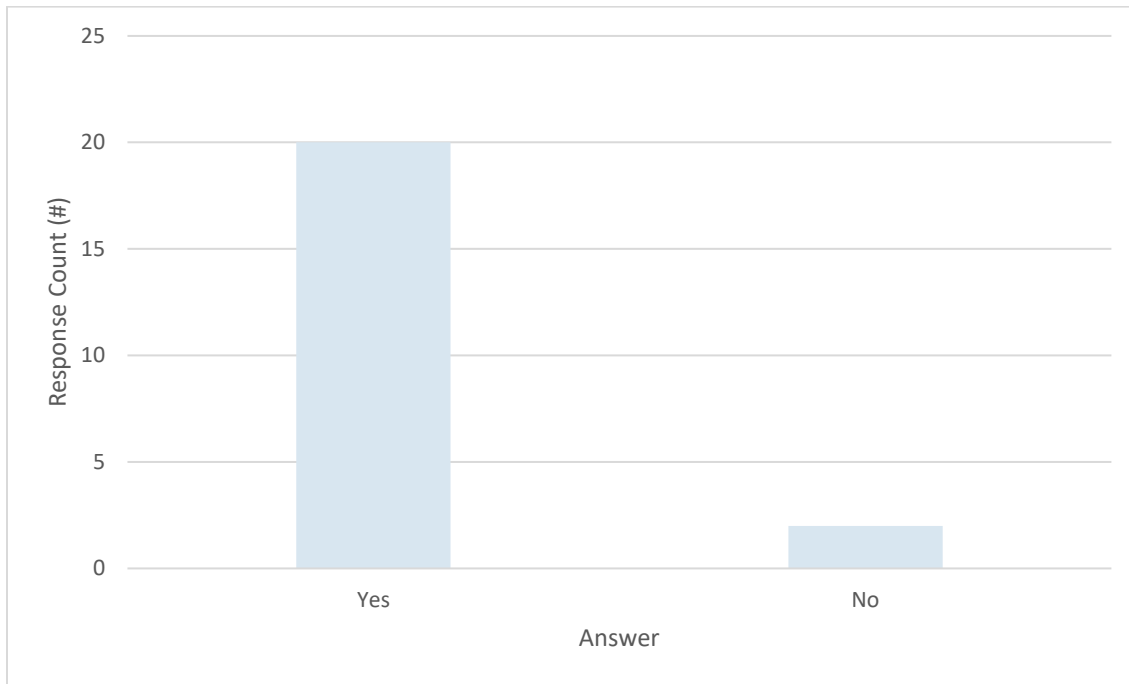


Figure C-2 Rural Community Respondents, Nova Scotia Municipal Survey 2025

Question 3

Municipal representatives were asked to rate their familiarity with planned subsea cable and additional OSW buildout in Nova Scotia on a scale of 1 – 10, with one being completely unfamiliar and 10 being very familiar. The weighted average familiarity was 4.7/10.

Question 4

Municipal representatives were asked to select the approximate population size of their municipality. Most respondents selected 1,000-29,000 people (19/22), followed by 0-1,000 people (2/22) and 500,000+ people (1/22), as shown in Figure C-3.

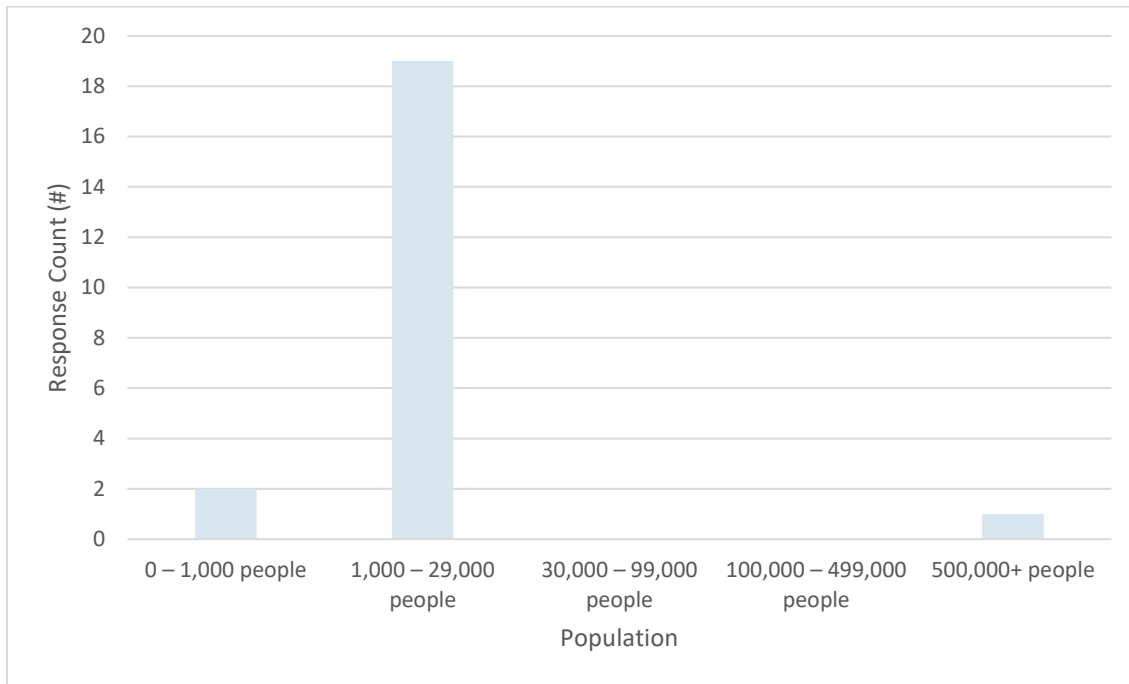


Figure C-3 Approximate Size of Municipality, Nova Scotia Municipal Survey 2025

Question 5

Municipal representatives were asked to characterize their community’s population growth over the last five years. Most respondents selected low-medium growth (12/21), followed by mild-medium decline (4/21), no growth (2/21), I am not sure (2/21), and high growth (1/21), as shown in Figure C-4.

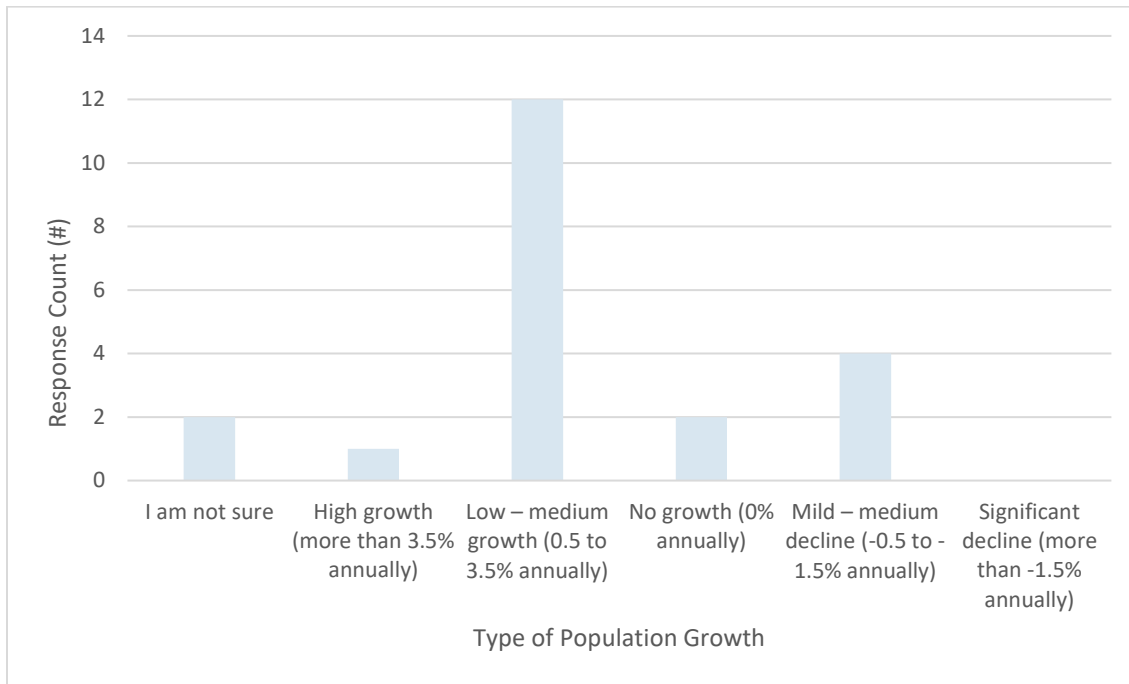


Figure C-4 Population Growth in Municipality Past Five Years, Nova Scotia Municipal Survey 2025

Question 6

Municipal representatives were asked if an influx of workers for a subsea cable and additional buildout of OSW would have a positive effect on their municipality. Most respondents selected positive impact (15/22), followed by neutral (4/22), not applicable (2/22), and negative (1/22) as shown in **Error! Reference source not found.**

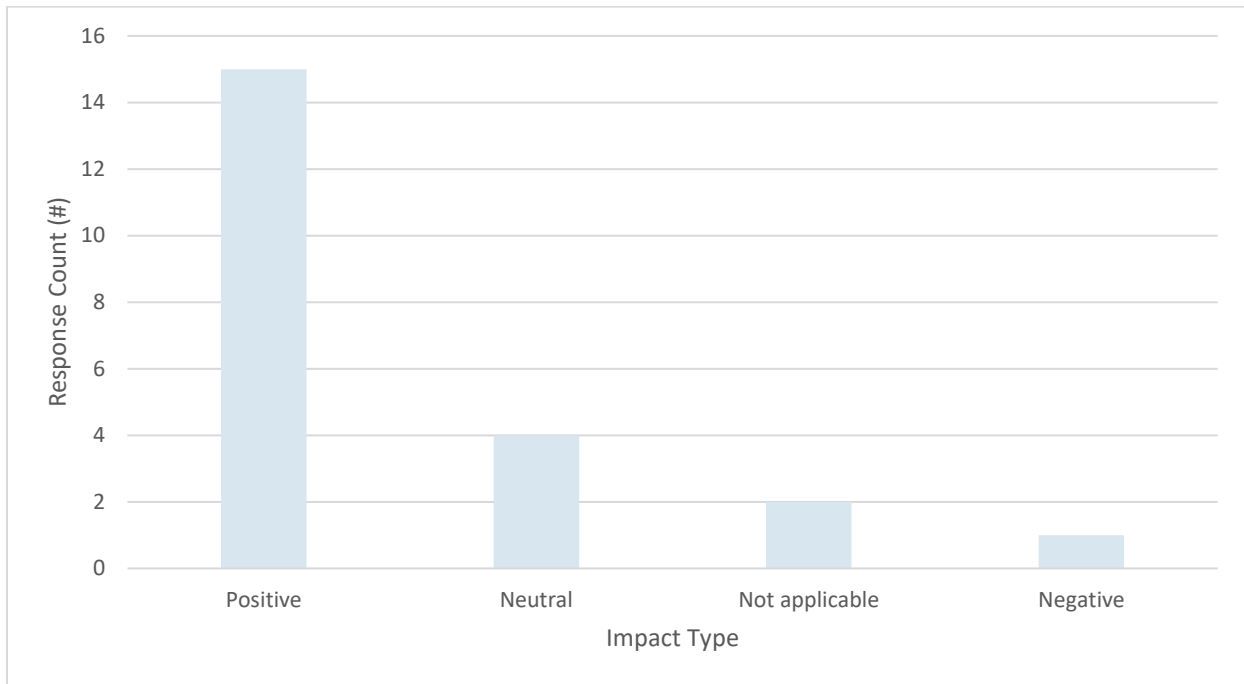


Figure C-5 Impact of Subsea Cable and Additional Buildout, Nova Scotia Municipal Survey 2025

Question 7

Municipal representatives were asked to select the key drivers of population change in the last five years. The most popular options selected were interprovincial migration (15/22), followed by pandemic-driven relocation (12/22), aging population (11/22), and international immigration and non-permanent residents (8/22) as shown in Figure C-6. Answers input into the “other” text box include “children moving away due to lack of opportunity”, “artists flocking to a creative rural community”, and “unsure of town growth with regard to list”.

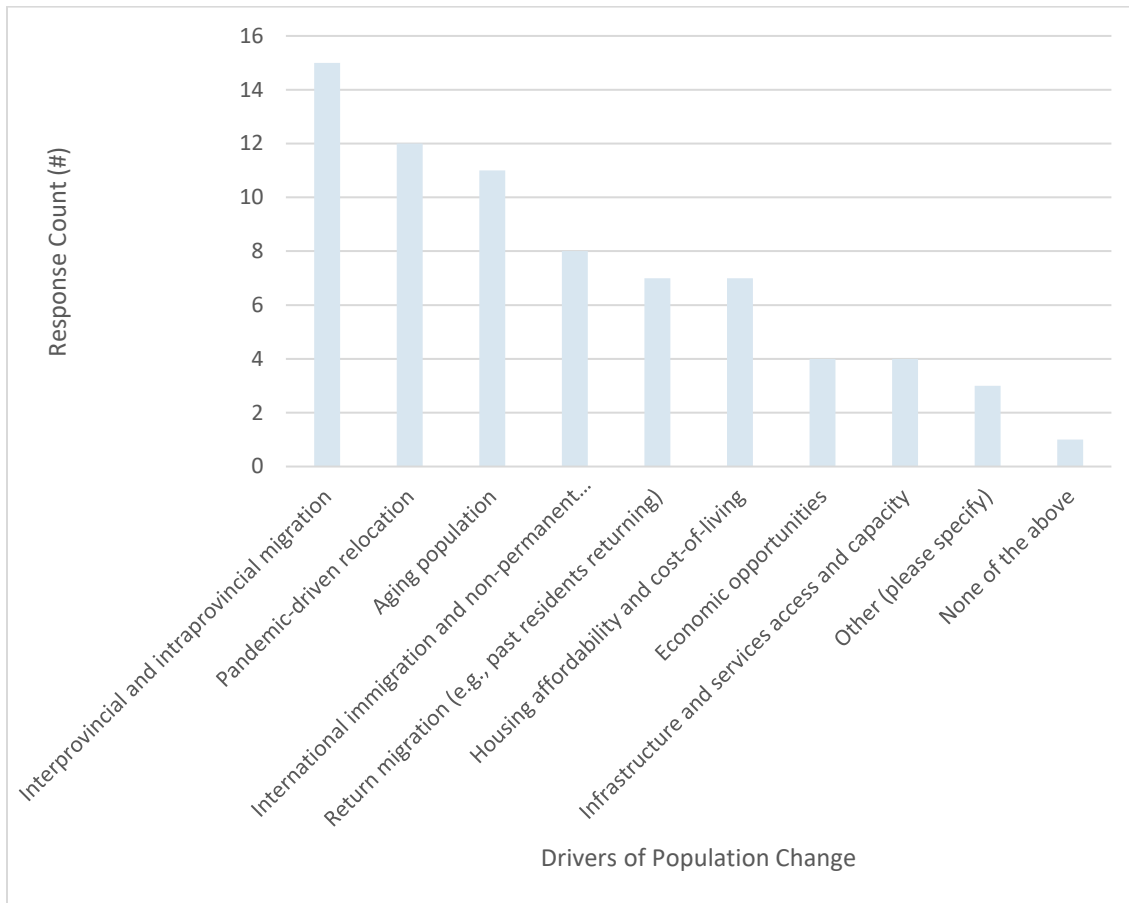


Figure C-6 Key Drivers of Population Change, Nova Scotia Municipal Survey 2025

Question 8

Municipal representatives were asked to identify the top five challenges their municipality currently faces. The most commonly identified challenge was healthcare access and wait times (17/21), followed by cost of living and affordability, excluding housing (16/21), and affordable housing (13/21). Tax revenues were selected by 12 respondents, while employment opportunities and wages (9/21) and youth retention and outmigration (8/21) were also notable concerns. Mental health and addictions services were selected by 7 respondents, and infrastructure and transportation and climate change by 5 each. Fewer respondents identified community culture (3/21), education system capacity, supports for seniors, food security, and other (each 1/21) as challenges. No respondents selected none of the above, Indigenous Rights, or crime, as shown in Figure C-7.

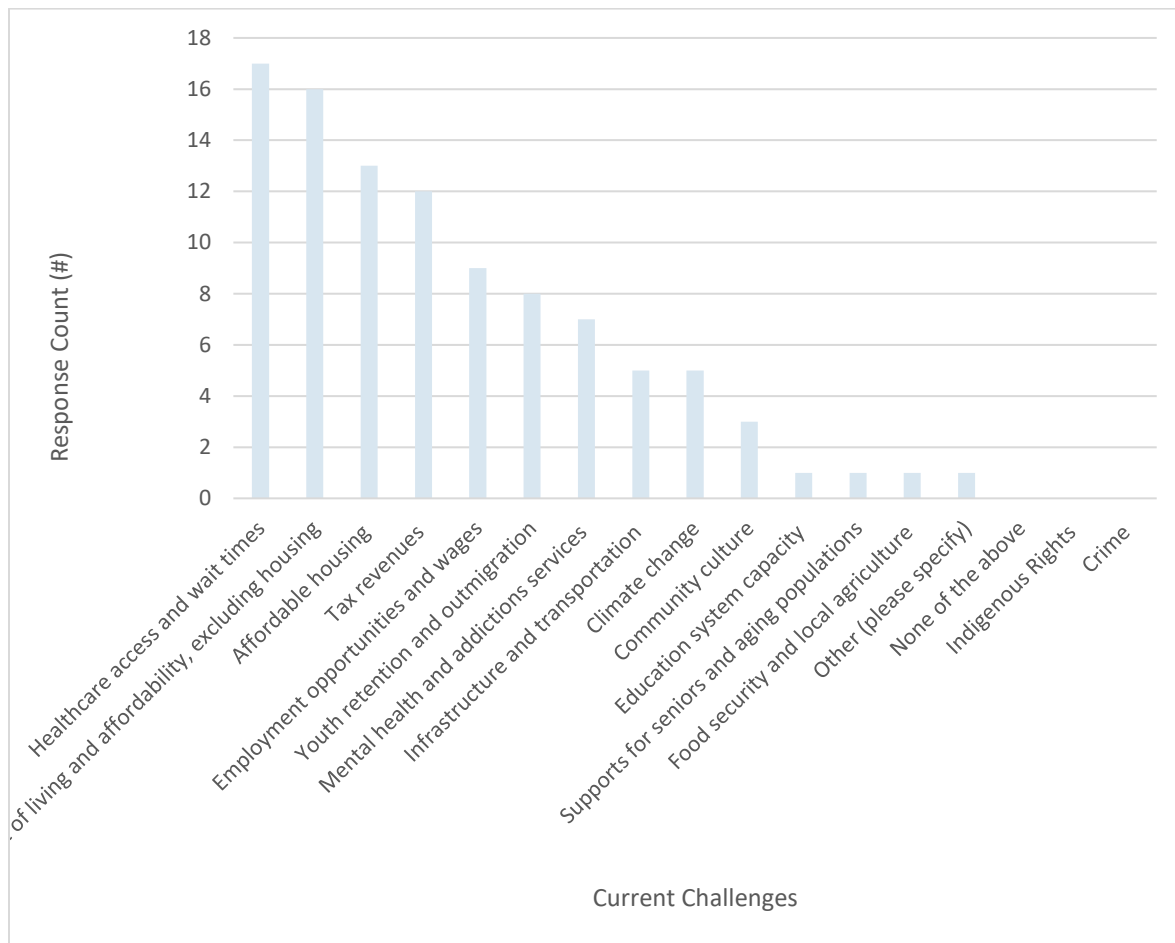


Figure C-7 Current Challenges, Nova Scotia Municipal Survey 2025

Question 9

Municipal representatives were then asked if the development of a subsea cable and additional OSW buildout affect any of the existing challenge areas they selected in the last question and to characterize the effect in question.

Several challenges were viewed as having a predominantly positive impact. All respondents (10/10) who selected tax revenues noted a positive effect. Similarly, all respondents (8/8) who selected employment opportunities and wages, and most (7/8) who selected youth retention and outmigration, saw positive outcomes. Infrastructure and transportation was also seen positively by most (3/4), with one neutral response. These responses suggest optimism around economic growth, job creation, and infrastructure improvements.

In contrast, several challenges were associated with more neutral or negative impacts. For affordable housing, nearly half (5/11) viewed the impact as negative, with 2/11 neutral and 4/11 positive. Healthcare access and wait times had a majority neutral response (7/14), with 3/14 negative and only 2/14 positive. Mental health and addictions services were mostly seen as

neutral (3/5), with one negative and one not applicable. Community culture was viewed as neutral (2/3) or negative (1/3). Other areas such as education system capacity, supports for seniors, and food security had low response counts but leaned toward neutral or not applicable. These results highlight areas of concern or uncertainty, particularly around healthcare services and housing. Responses are shown in Figure C-8.

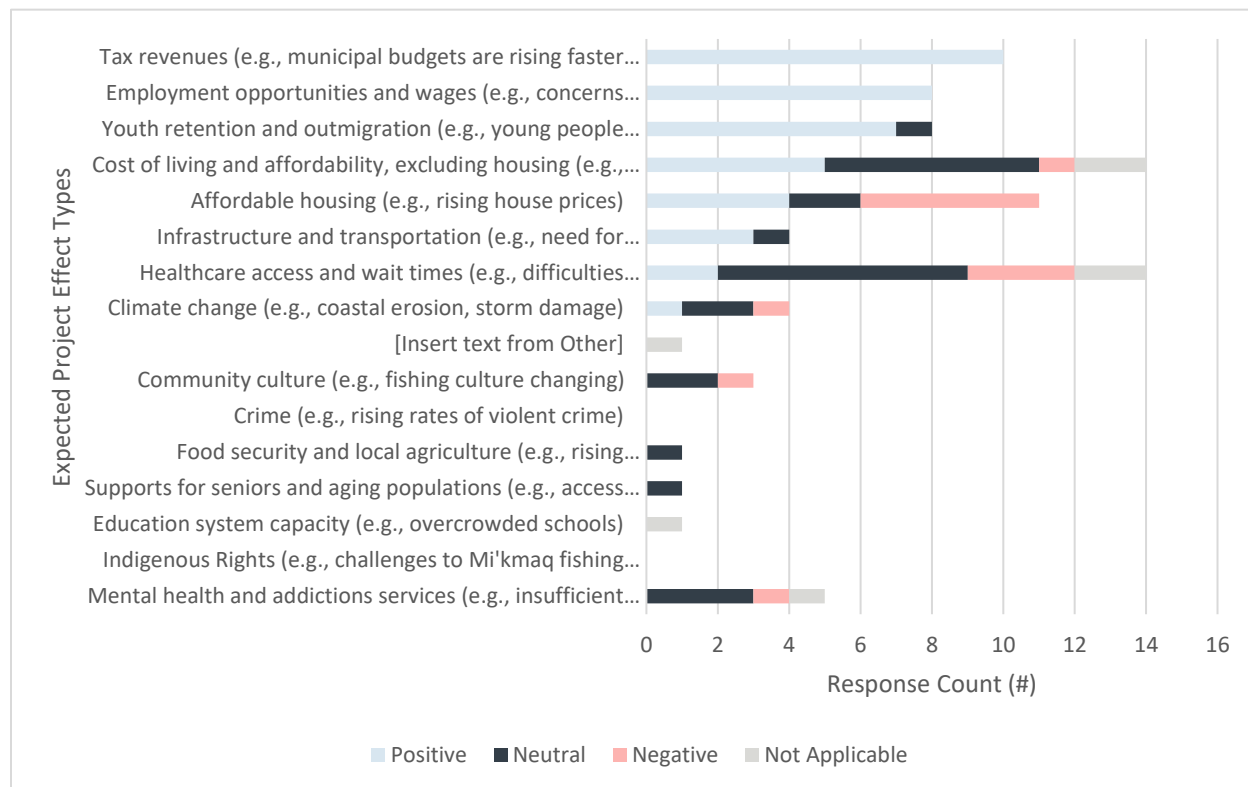


Figure C-8 Expected Project Effect on Existing Challenges, Nova Scotia Municipal Survey 2025

Question 10

Municipal representatives were asked to identify the type – positive, neutral, negative – of expected project effect on their municipality at each point in the life cycle for the development of a subsea cable and additional OSW buildout. Anticipated impacts varied each point in the life cycle. Respondents anticipated construction / installation as having the most positive (13/18) and least neutral (3/18) effects. Development (9/18), manufacturing of equipment (9/18), and commissioning (8/18) were all identified as having comparable positive anticipated effects as shown in Figure C-9. No negative effects were identified throughout the life cycle of the project for this question.

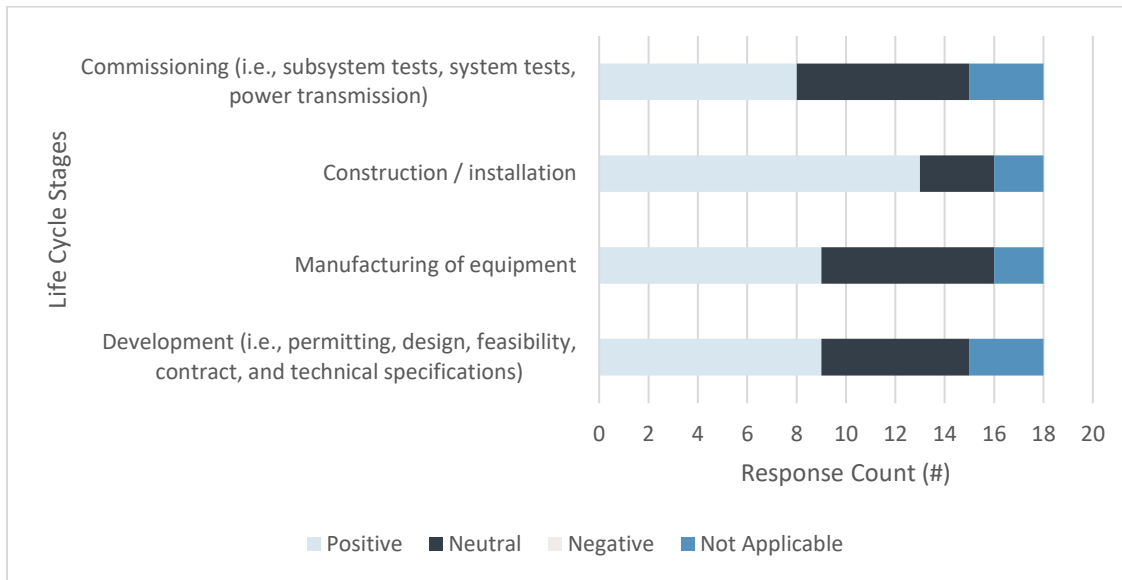


Figure C-9 Type of Effect by Life Cycle of Subsea Cable and Additional Buildout, Nova Scotia Municipal Survey 2025

Question 11

Municipal representatives were asked to select the top three types of community services which would be most impacted in their municipality as a result of a subsea cable and additional buildout of OSW. The most frequently selected service was health services (9/18), followed by emergency services (6/18). Recreational and cultural services, education and childcare, and solid waste management were each selected by 3/18 respondents. Water and sanitation was noted by 2/18 respondents, and social services by 1/18, as shown in [Figure C-10](#). None of the above was also selected by 3/18 respondents, indicating a minority did not identify any of the listed services as relevant.

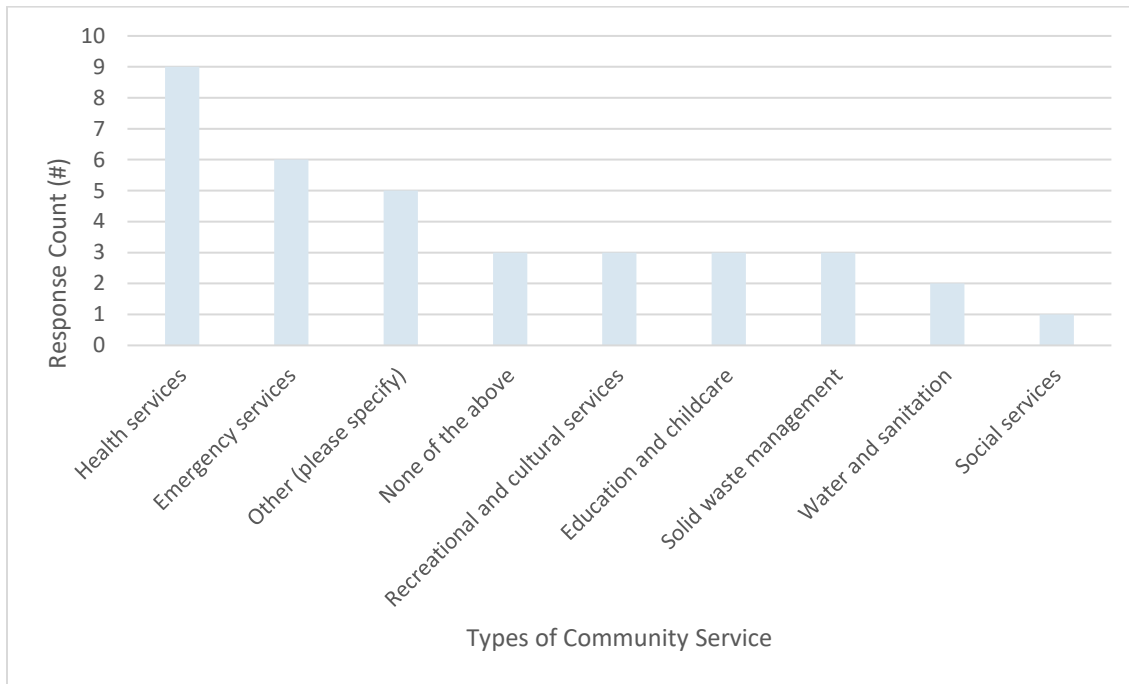


Figure C-10 Expected Community Service Effects, Nova Scotia Municipal Survey 2025

Question 12

Municipal representatives were asked to identify the type of anticipated effect on social services selected in the previous question. Services with mostly positive responses included recreational and cultural services (3/3) and solid waste management (2/3), indicating general satisfaction or optimism about potential project impacts on these services.

Services with more neutral or negative responses included education and childcare (0/3 positive, 0/3 neutral, 3/3 negative), social services (0/1 positive, 1/1 neutral, 0/1 negative), emergency services (2/5 positive, 2/5 neutral, 1/5 negative), health services (2/9 positive, 4/9 neutral, 3/9 negative), and water and sanitation (1/2 positive, 1/2 neutral, 0/1 negative), as shown in Figure C-11. These results suggest mixed or critical views on potential project effects, particularly regarding education, childcare, and social support systems.

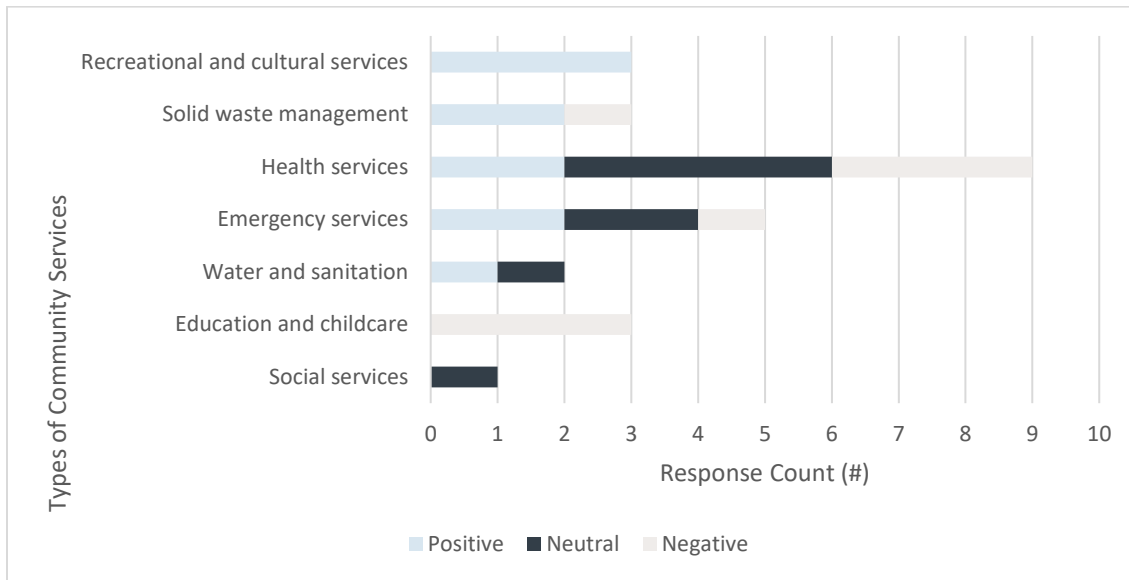


Figure C-11 Expected Type of Project Effects on Community Services, Nova Scotia Municipal Survey 2025

Question 13

Municipal representatives were asked to identify the top three types of community infrastructure that would be impacted in their municipality as a result of the development of a subsea cable and additional OSW buildout. The most frequently selected infrastructure need was utilities and energy grid (14/18), followed by ports and harbours (12/18) and roads and transportation (10/18). Telecommunications was selected by 3/18 respondents, while none of the above was chosen by 2/18, as shown in Figure C-12. Public recreation facilities received no selections.

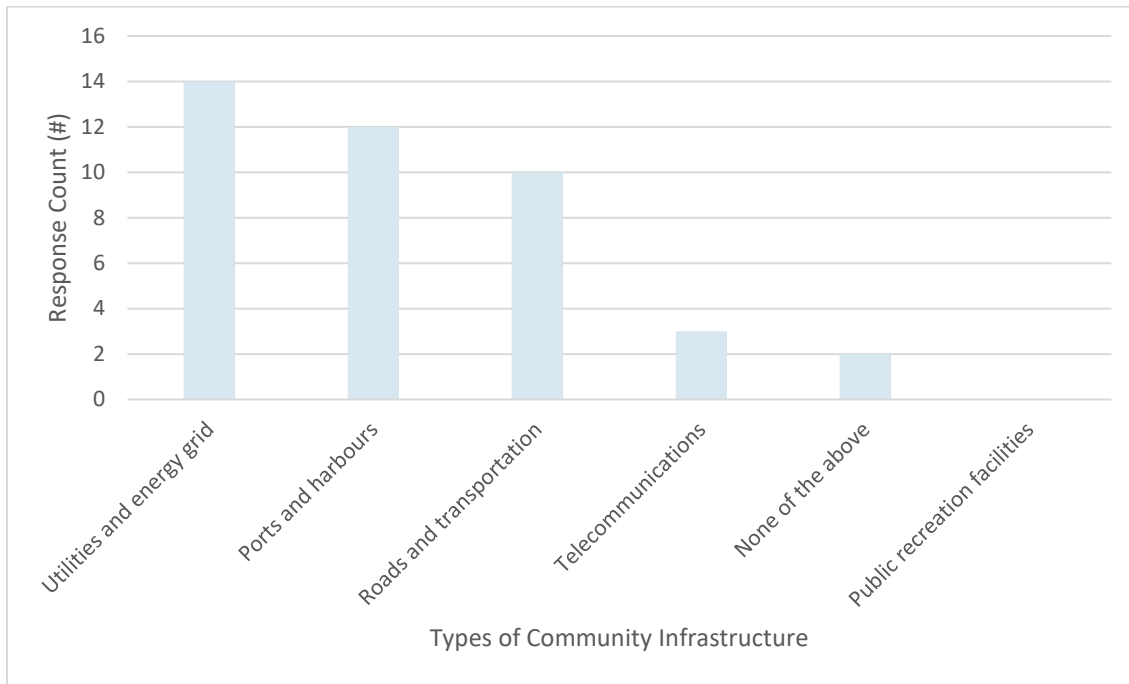


Figure C-12 Expected Project Effects on Community Infrastructure, Nova Scotia Municipal Survey 2025

Question 14

Municipal representatives were asked to select the type of impact – positive, neutral, negative – to the community infrastructure selected in the previous question. Infrastructure options with mostly positive responses included utilities and energy grid (9/13), ports and harbours (8/11), and telecommunications (2/3), as shown in Figure C-13. These results may suggest that respondents generally view investments in these areas as beneficial to their communities. Options with more neutral or negative responses included roads and transportation (4/9 negative; 2/9 neutral), indicating more mixed or critical perspectives on its potential impact.

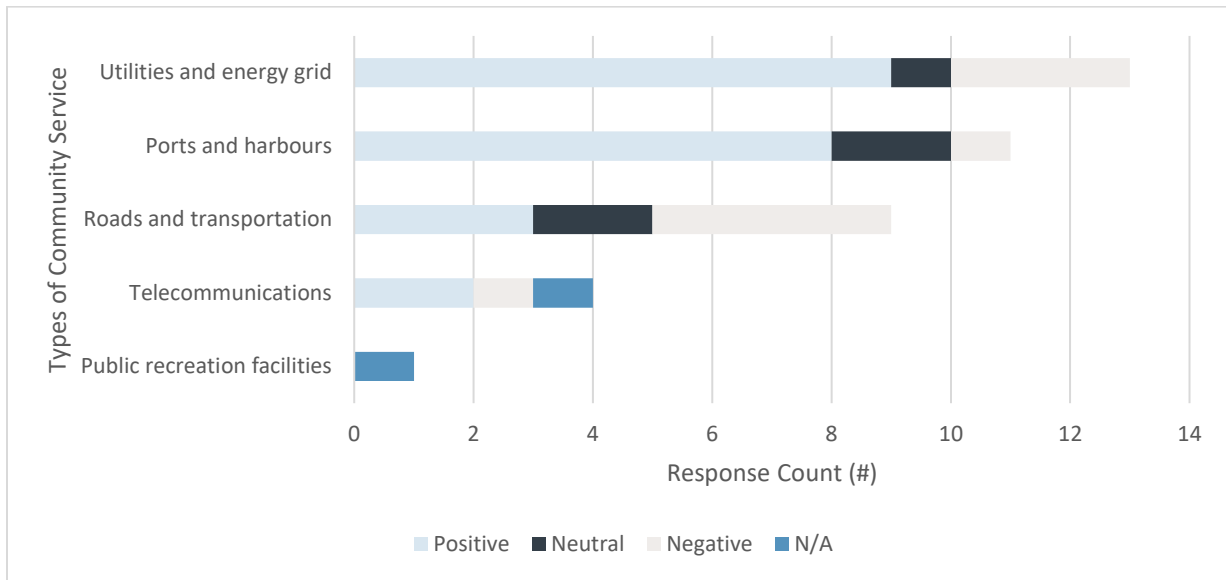


Figure C-13 Expected Type of Project Effects on Community Services, Nova Scotia Municipal Survey 2025

Question 15

Municipal representatives were asked to select the top three expected labour force impacts as a result of a subsea cable and additional buildout of OSW. The most frequently selected labour force impact was increased demand for trades and technical workers (14/18), followed by new job creation (13/18). Opportunities for youth and recent graduates was selected by 7/18 respondents, and growth in local supply chain and service industries by 6/18. Higher wages compared to existing local industries was noted by 4/18 respondents, while other was selected by 3/18 respondents, as shown in Figure C-14. None of the above was chosen by 1/18 respondents, indicating minimal disagreement with the listed options.

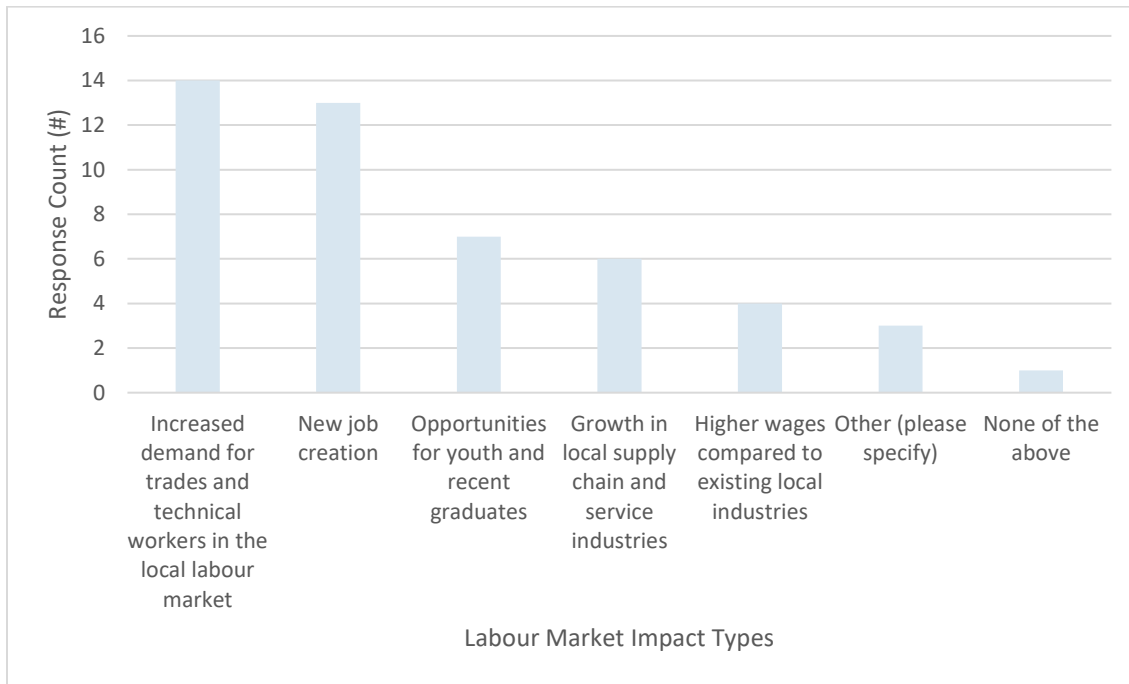


Figure C-14 Expected Labour Market Impacts, Nova Scotia Municipal Survey 2025

Question 16

Municipal representatives were asked to select the type of impact – positive, neutral, negative – to the labour force change selected in the previous question. All labour force impacts had exclusively positive responses including increased demand for trades and technical workers (14/14), new job creation (12/12), opportunities for youth and recent graduates (7/7), growth in local supply chain and service industries (6/6), and higher wages compared to existing local industries (4/4). No valid neutral or negative responses were selected. These results reflect a consensus on the potential positive employment effects of subsea cable and offshore wind development.

Question 17

Municipal representatives were asked to what extent they agree with the statement: “My community has the skilled labour needed to support a subsea cable and additional buildout of OSW.” Most respondents (9/18) selected “neither agree nor disagree,” followed by 7/18 agree, 1/18 strongly agree, and 1/18 disagree. No respondents selected “strongly disagree,” as shown in **Figure C-15**.

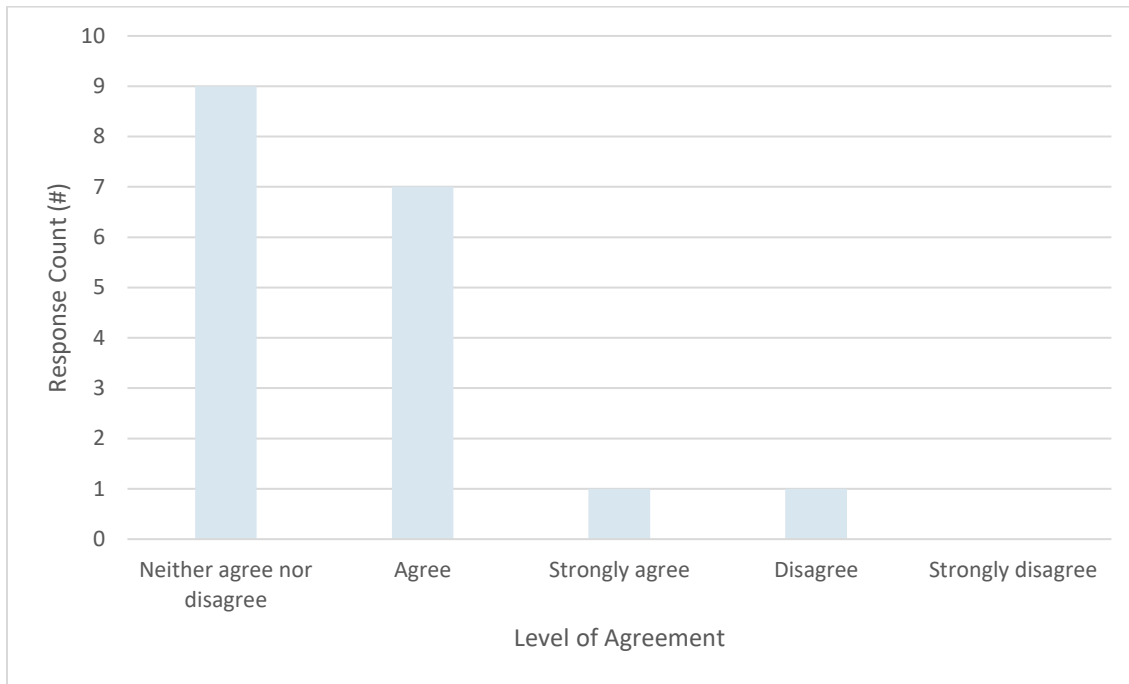


Figure C-15 Skilled Labour Needed Available, Nova Scotia Municipal Survey 2025

The high number of neutral responses may indicate that municipal representatives are uncertain about the availability of skilled labour in their communities or recognize that while some capabilities exist, gaps may remain in other areas.

Question 18

Municipal representatives were asked to what extent they agree with the following statement: “Members of my community have the local education and training needed to support employment opportunities related to a subsea cable and additional buildout of OSW.” Most respondents (10/18) noted they neither agree nor disagree, followed by 7/18 agree, 2/18 disagree, and 1/18 strongly agree. No respondents selected “strongly disagree,” as outlined in Figure C-16.

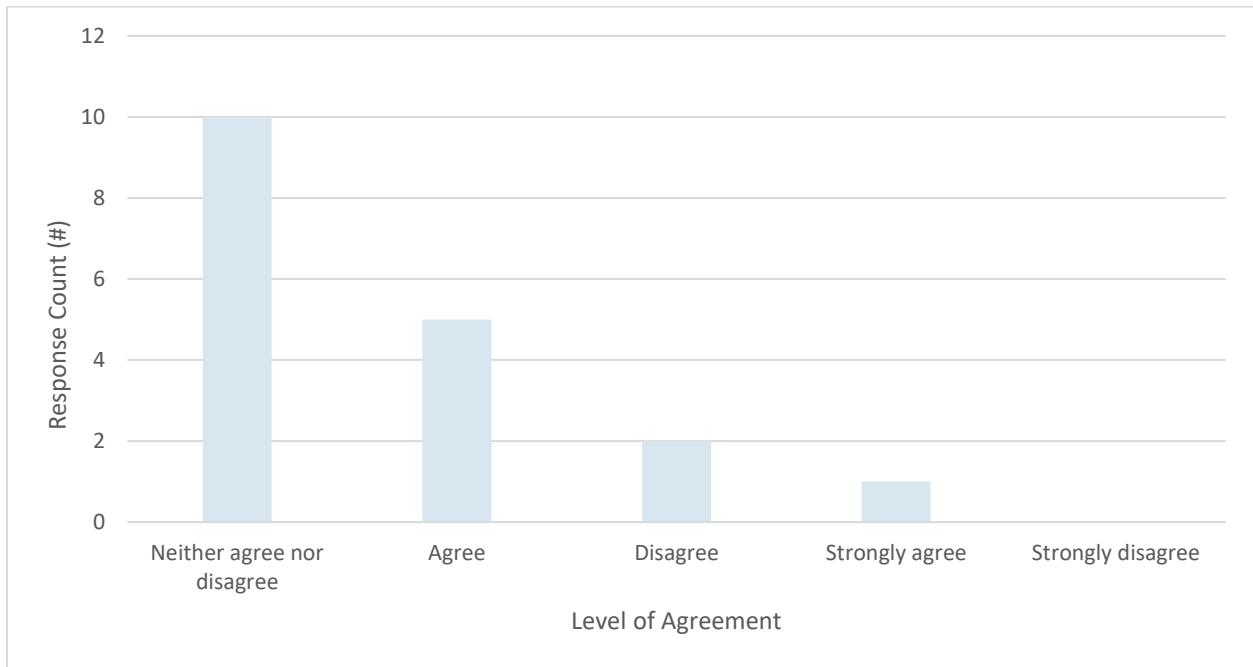


Figure C-16 Local Education and Training Available to Support Employment Opportunities, Nova Scotia Municipal Survey 2025

Neither agree nor disagree results may indicate that municipal representatives are unsure about whether the local education and training needed to support employment opportunities is available in their area or they agree that specific programs are available while being aware that there may be gaps in other education or training areas.

Question 19

Respondents were asked to list any challenges or opportunities they think Net Zero Atlantic should know about not mentioned in previous questions. Eight respondents input answers into the open text box. Key additional challenges and opportunities mentioned are outlined below.

Challenges:

- Impact on existing industries: Concerns about negative effects on the fishing, seafood, and lobster sectors.
- Social and cultural disruption: Risks of temporary workforce influx leading to community change, party culture, and unsustainable economic effects.
- Equity and benefit distribution: Skepticism about local benefits, especially for low-income residents, and concerns about reliance on external labor.
- Public services strain: Potential pressure on healthcare, childcare, and education systems.

- Community engagement: Need for proper consultation with local ocean users.
- Demographic limitations: Low population as a barrier.

Opportunities:

- Local economic development: Use of local ports, utility improvements, and support industries.
- Energy benefits: Enhanced energy access and market opening for Nova Scotia.
- Workforce and education: Skilled labor, trades development, and educational programs.
- Community revitalization: Bringing people back, leveraging past project experience.
- Cross-sector collaboration: Engagement between fishery and energy sectors.
- Civic pride and capacity: Strong local belief in industry and project readiness.