

Nova Scotia Offshore Wind Roadmap

Module 2

Supply Chain & Infrastructure



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1. Introduction

Surrounded by the ocean, Nova Scotia has a long history of success in maritime and offshore industries. Offshore wind adds a game-changing opportunity: to leverage the province's strength and innovation in the oceans sector to meet the challenge and opportunity presented by a climate target of net zero emissions by 2050. Our offshore wind speeds are world-class, rivalling even those of the North Sea, where the global offshore wind sector began. Creating offshore wind farms in the waters surrounding Nova Scotia will add a new, local source of renewable electricity, enable greater decarbonization of the electricity grid, and grow the province's green hydrogen industry.

A strong, local supply chain and robust infrastructure are critical to the successful development of an offshore wind sector. We are poised to leverage its expertise, infrastructure, and strategic location to become a leader in Canada's burgeoning offshore wind market, and to ensure local project content yields significant benefits and opportunities for businesses and communities.

Developing our offshore wind sector has the potential to spur economic growth, creating new jobs, business opportunities, and benefits for communities – benefits that are already accruing in other active jurisdictions. Studies of the United Kingdom's offshore wind industry, for example, estimate that 1,500 full time employment (FTE) jobs are created per gigawatt (GW) during the construction phase, and 350 local FTE jobs are enabled per year per GW output during the operating life of a project (about 25 years)¹.

Nova Scotia does not yet have offshore wind projects in active development, but the industry has already demonstrated its ability to fuel local business opportunities. Strategically located ports and companies throughout the province are providing key services like monopile marshalling, seabed characterization, environmental monitoring, professional and manufacturing services in support of the over 16 GW of planned offshore wind capacity along the United States' east coast. Nova Scotia is already building supply chain capacity now to be in a strong position for Canada's offshore wind market in the future.

Supply chain readiness for the offshore wind industry takes years. Significant lead time is necessary to plan and develop ports, help businesses and communities prepare to participate in the industry, and train an essential, varied workforce. The offshore wind market is experiencing rapid growth throughout the world with over 380 GW of new offshore wind capacity forecasted to be added over the next decade.² This pace of growth and high demand for supplies and services is resulting in global supply chain shortages. Building Nova Scotia's offshore wind supply chain is therefore not only an economic opportunity, it's a necessity to avoid supply chain bottlenecks and ensure growth.

¹ KPMG. "Factoring social and community impacts into the offshore wind business case." (December 2023)

² Global Wind Energy Council. "Global Offshore Wind Report." (2023) <https://gwec.net/gwecs-global-offshore-wind-report-2023/#:~:text=The%20outlook&text=GWEC%20Market%20Intelligence%20expects%20that,by%20the%20end%20of%202032>.

Module 2 of Nova Scotia's Offshore Wind Roadmap outlines the Province's early strategic actions to establish an inclusive, sustainable supply chain that capitalizes on the strengths of the province's existing industries and benefits local businesses and communities, members of Mi'kmaw, African Nova Scotian, and African Descent communities, as well as other underrepresented and underserved groups. This Module was informed by targeted engagement and feedback from Nova Scotia suppliers, communities, Indigenous groups, and organizations with interests related to offshore wind development. The approach outlined in Module 2 is based on Nova Scotia's initial 5 GW offshore wind leasing target. This target can support various markets, including green hydrogen production for export and domestic use, local grid integration, direct energy export to the United States, and more. These early strategic actions are designed to support the first phases of development and build a foundation for long-term, sustainable growth beyond 5 GW.



2. Update on Province's Path for Offshore Wind Development

Nova Scotia's Offshore Wind Roadmap is a living document, continuing to evolve as the offshore wind industry builds momentum. The Province is ramping up engagement with the Mi'kmaq of Nova Scotia, fishers, communities, industry, and other interested parties to generate important feedback. Following the release of Module 1 of the Roadmap in June 2023, the Province has continued its work to support the sustainable development of its offshore wind resource.

Following a period of engagement and feedback, the Province [announced](#) its intention to focus first on building the regulatory framework for offshore wind energy development in areas jointly managed with the federal government before considering waters under solely provincial jurisdiction. The Province has a goal of issuing the first call for bids for offshore wind licences in 2025.

In addition, since the release of Module 1, the Nova Scotia government has worked collaboratively with partners to support ongoing proactive engagement and capacity building initiatives for the Mi'kmaq, as well as with key groups like the fishing and offshore wind industries. This engagement reflects the Province's commitment to a collaborative and inclusive approach in shaping the future of offshore wind energy in Nova Scotia. The insights, perspectives, and valuable input gathered during this ongoing engagement will be elaborated upon in Module 3.

The work to build our offshore wind sector is being carried out in parallel with many other initiatives, including the Regional Assessment for Offshore Wind Development in Nova Scotia ("Regional Assessment"), as well as the legislative process to amend the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* ("Accord Act"), establishing regulatory authority for future offshore wind development. The final module of Nova Scotia's Offshore Wind Roadmap is therefore slated to be released in 2025 after the Regional Assessment Committee's delivery of its final report.

3. Nova Scotia's Goals for Supply Chain Development

In the development of its offshore wind supply chain, Nova Scotia is strategically positioned to leverage its diverse and well-established maritime and offshore experience.

To foster a sustainable, competitive, and inclusive supply chain that optimizes Nova Scotia's strengths and positions the province for long-term success in offshore wind development, the following goals have been established:

- Ensure initial goal of 5 GW of offshore wind development is successful and sustainable by establishing a strategy that optimizes local participation in the supply chain, including diversification opportunities for existing ocean users, while recognizing the need to ensure timely and economically viable project development.
- Optimize opportunities for Nova Scotia businesses and communities to benefit from offshore wind development, creating a supply chain that is “best in class” which can leverage and enable global participation in the sector for decades to come.
- Establish an offshore wind supply chain that is inclusive, diverse, and equitable creating opportunities for Mi'kmaw, African Nova Scotian, and African Descent communities, as well as other underrepresented and underserved groups.



4. The Offshore Wind Supply Chain

The offshore wind supply chain encompasses the skills, services, supplies, technologies and infrastructure required to support the entire lifecycle of an offshore wind project – from the planning stage through to decommissioning. This supply chain includes many different skillsets, tools and service providers, including marine scientists and engineers, mechanical and electrical technicians, vessels, environmental monitoring technologies, ports, steel fabrication, manufacturing and supporting expertise such as insurance, legal, and financial services.

The first step towards growing a sustainable and inclusive offshore wind supply chain in Nova Scotia is to ensure that local businesses and communities have a solid understanding of how and where they fit in supporting project development.

As a starting point, this section provides a high-level description of supply chain categories, the services, suppliers and equipment required to fulfill project requirements, and the phases of offshore wind project development.

Supply Chain Categories and Types of Suppliers

Although Nova Scotia does not yet have a mature offshore wind supply chain, many local businesses are well suited to participate given their strength and experience in related industries such as offshore oil and gas, shipbuilding, marine transport, fishing, and ocean technology. An initial overview of supply chain categories and requirements for project development has been compiled to provide a glimpse of what is needed for offshore wind (see Figure 1).

For suppliers interested in engaging in the offshore wind sector, it is important to recognize that supply chain requirements differ between fixed and floating offshore wind technologies.

Offshore Wind Supply Chain

	RESEARCH & DEVELOPMENT	Academia, research centres, technology incubators
	EDUCATION & TRAINING	Universities, colleges, training programs
	PROFESSIONAL SERVICES	Finance, insurance, legal, communications, marketing
	ENGINEERING & CONSULTING	Technical, electrical, mechanical, environmental expertise
	PROJECT DVLPT & PLANNING	Project developers, consulting services, permitting expertise, approvals planning, environmental evaluations
	SUPPORTING TECHNOLOGY	Resource measurement, environmental monitoring, buoys, underwater remote vehicles, data collection
	MANUFACTURING	Foundations/substructures (monopile, tripod, jacket, gravity-based foundations, floating structures), transition pieces (including platforms, etc.), towers, nacelle (including generator, gearboxes, bearings, power electronics, forged rings and shafts, semiconductors, large castings), blades
	TRANSPORTATION & INSTALLATION	Land transport (special trucks/trains), ports/port handling (heavy-lift vessels), cranes, vessels (barges, tugboats, wind turbine installation vessel, etc.)
	GRID CONNECTION	Array & export cables, cable-laying vessels, converter platform offshore, converter station onshore, substations, switchgear
	EMERGENCY SERVICES	Rescue service providers, fall protection
	OPERATIONS & MAINTENANCE	Service operations vessel, crew transfer vessel, offshore & onshore logistics, health & safety, ports, turbine maintenance

Figure 1 Offshore Wind Supply Chain Categories

In offshore wind projects, supply chain categories are further delineated by supplier types, typically involving three tiers:

- **Tier 1 suppliers:** Companies contracted as primary suppliers for offshore wind projects by the developer, covering items such as wind turbines, foundations, towers, offshore substations, cables, transmission, environmental services, data collection, monitoring, engagement with interested parties, and operation and maintenance.
- **Tier 2 suppliers:** Principal suppliers to Tier 1 suppliers, offering services like crane operations, civil engineering for onshore electricity infrastructure, subsea cable protection, electrical components, tower manufacturing, yaw and pitch motors, barges, tugboats, and fall-arrest systems.
- **Tier 3 suppliers:** Providers of specialized services and products to Tier 2 suppliers, including secondary steel fabrication for foundations or towers, specialized tools, fuel services, dive and survey operations, rubber, concrete, railings and ladders, castings, and hydraulics.

Nova Scotia's rich marine history has cultivated a network of strong Tier 2 and Tier 3 suppliers, a unique strength that positions the province advantageously in building its offshore wind supply chain. This depth of experience not only enhances the province's capabilities but also provides a solid foundation for expanding into the offshore wind sector.

Enabling Infrastructure

Unlocking the potential of offshore wind requires extensive infrastructure. Ports play key roles at all development phases of an offshore wind project's lifespan. Their roles and their required characteristics vary depending on the type of offshore wind turbine – floating or fixed (see Figure 2) – as well as the development phase.

Offshore wind projects generally require different types of port facilities for the different stages of project activity:

- *Manufacturing* – where turbine components are built
- *Staging/Marshalling* – where parts are shipped and stored or assembled prior to reaching the offshore wind project site
- *Operations and maintenance* – bases for vessels and crew involved in day-to-day operations

The requirements for each of these types of ports will differ depending on the type of turbine foundation. Fixed-bottom turbines are assembled at sea, while floating turbines are assembled on or near land and towed to sea once complete. The unique characteristics of a floating project such as the turbines and floating substructure, require the need for a staging and installation port with large and level upland and quayside areas, no air draft restrictions, heavy loading capability, heavy lift land-based cranes, water depth to deploy the components and proximity to installation sites. In addition to having a sufficient capacity to serve as a manufacturing hub, an installation port will need to handle, store, integrate, launch, and wet store for integrated floating offshore wind turbines before they are towed to the development area.

Project components such as cables, foundations, transition pieces, towers, and turbines would likely be manufactured and sourced from multiple fabricators and suppliers outside of Nova Scotia. Therefore, for fixed-bottom developments, ports will serve as a central storage, staging and preassembly area. Components are then loaded onto specialized offshore wind installation vessels for ultimate project build out.

Ports also support the long-term maintenance of offshore wind projects. Once developed, an operational wind farm will require continuous monitoring, inspection, maintenance, crew vessels, and skilled workforce. For floating offshore wind, certain maintenance activities may be carried out at a port.

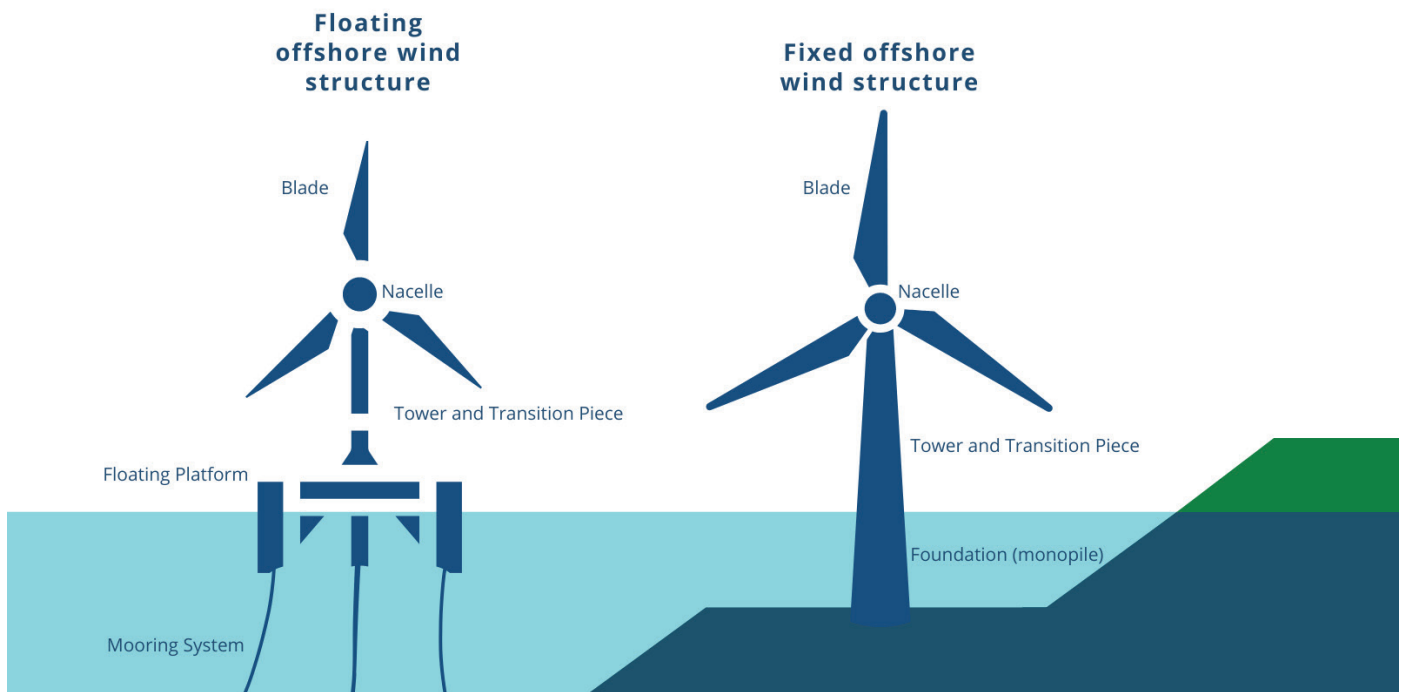


Figure 2 Fixed and Floating Offshore Wind Major Components

In both cases, whether fixed or floating offshore wind, the distance between the port and the offshore wind project site can significantly impact project costs and timelines. There is a clear commercial rationale to invest in and use local ports to support offshore wind projects off the coast of Nova Scotia.

Not all jurisdictions with offshore wind projects have all the required port facilities. In fact, in the United States context, many large turbine components are being manufactured in Europe, transported on specialized vessels to marshalling ports in Nova Scotia and Newfoundland, and then transported again to project sites. The [AEGIR Value Mapping Nova Scotia's Offshore Wind Resources report](#) (commissioned by the Province through Net Zero Atlantic and updated in April, 2023) noted that ports located throughout Nova Scotia hold potential as either construction and marshalling or operations and maintenance facilities for offshore wind development.

Offshore wind development requires a network of port facilities to efficiently manufacture, store, stage, install, and maintain offshore wind turbines. For a typical offshore wind project, multiple ports, preferably near the offshore site, can play a central role in all stages of an offshore wind farm's lifecycle - from planning stages to operation and maintenance. Ports are typically utilized on a project-to-project basis by project developers and installation contractors.

Ideally, any port supporting an offshore wind industry will need the following attributes:

- Proximity to project sites;
- Navigational access and water depth to accommodate specialized vessels and components;
- Adequate quayside space and load bearing capacity;
- Sufficient space for storage, assembly, manufacturing, and operations;
- Crane capacity to transport and lift components and integrate turbines at the port;
- Launch and wet storage facilities;
- Manufacturing and assembly facilities for key components; and
- Connectivity to other modes of transportation.

In addition to their direct impacts on the success of offshore wind development and operation, ports also act as economic engines for their communities and regions. As Nova Scotia explores offshore wind opportunities, it will be important to understand the role ports will play and what is needed to ensure they meet the needs of future offshore wind projects, while continuing to service existing industries.

Phases of Offshore Wind Project Development

The development of an offshore wind farm involves a well-established sequence of phases, each including distinct aspects of the supply chain. Development phases span from initial environmental assessments and site selection to construction, operation, and eventual decommissioning (see Figure 3).

- **Planning and Development:** This phase of the offshore wind process typically requires two or more years and is aimed at learning characteristics of the sites and determining feasibility of a project. Environmental and technical studies and activities are undertaken to help inform project design and provide details necessary for determining what types of permits, licences, and authorizations will be needed. Identify and follow the regulatory pathway requirements to obtain a submerged land licence and other necessary approvals to move the project forward.
- **Pre-construction:** During this phase a detailed design of the facility and its construction strategy are established. Contracts are secured with different suppliers in manufacturing and installation of substation(s), wind turbines, foundations or floating platforms, and cables.

- **Construction:** This phase is typically the most challenging and time-consuming part of the offshore wind farm development process. It involves the construction and installation of wind turbines, laying of subsea cables, installation of onshore electrical infrastructure such as the substation, and finally, connection to the grid or to facilities to produce green hydrogen and derivatives for export and potential domestic use.
- **Operations and Maintenance:** Once commissioned, an offshore wind project enters the operations and maintenance phase. This involves monitoring the performance of turbines and other infrastructure components, carrying out regular maintenance and repairs, and managing the logistics of transporting workers and equipment to and from the wind farm.
- **Decommissioning:** At the end of the life of a project, repowering (replacing old turbines with the latest technology) should be investigated first. If unfeasible, then decommissioning would occur. The decommissioning phase consists of the removal or making safe of offshore infrastructure at the end of its useful life, plus disposal of equipment.



Offshore Wind Phases of Development



	Activities	Professions	Time-frame
Planning & Development	<ul style="list-style-type: none"> • Site election & design • Feasibility studies • Environmental planning • Technical wind potential assessment • Technology evaluations • Component selection 	<ul style="list-style-type: none"> • Typically more than 75 occupations • ~15% of workforce requirement for a project 	<ul style="list-style-type: none"> • 3-5 years
Pre Construction	<ul style="list-style-type: none"> • Detailed facility design • Construction strategy • Supplier contracts secured for manufacturing & installation of substation(s), wind turbines, foundations or floating platforms, & cables. 	<ul style="list-style-type: none"> • Typically more than 75 occupations • ~15% of workforce requirement for a project 	<ul style="list-style-type: none"> • 2-4 years
Construction	<ul style="list-style-type: none"> • Foundation installation • Turbine installation • Array cable installation • Export cable installation • Substation foundation installation • Substation installation 	<ul style="list-style-type: none"> • Typically ~70 occupations • Up to ~40% of workforce requirement for a project 	<ul style="list-style-type: none"> • 2 years
Operations & Maintenance	<ul style="list-style-type: none"> • Wind farm operations • Structural maintenance, repair & logistics • Cable inspections • Substation operations, maintenance & logistics 	<ul style="list-style-type: none"> • Typically more than 60 occupations • Up to ~17% of workforce requirement for a project 	<ul style="list-style-type: none"> • 20+ years
Decommissioning	<ul style="list-style-type: none"> • Feasibility studies on project life extension, component recovery & recycling, etc. • Maritime logistics • Salvage & recycling 	<ul style="list-style-type: none"> • Unknown at this time, anticipated to be similar to the construction phase. Further assessment needed. 	

Figure 3 Offshore wind phases adapted from WindEurope. Profession estimates based on data from 2023 "Maine Offshore Wind Roadmap."³

³ Governor's Energy Office. "Maine Offshore Wind Roadmap." (February 2023) https://www.maine.gov/energy/sites/maine.gov/energy/files/inline-files/Maine_Offshore_Wind_Roadmap_February_2023.pdf

5. Building a Local Supply Chain

Establishing a local supply chain to support offshore wind projects is important for a number of reasons, including:

- Providing the expertise, supplies, and infrastructure needed to service projects.
- Creating a new economic opportunity for businesses, communities, and individuals.
- Expanding local suppliers' capabilities to support local offshore wind activity, and export their expertise and technologies to the global market.

At this early stage of offshore wind sector development, there are several factors to consider in establishing the optimal strategy for building Nova Scotia's offshore wind supply chain. These include evaluating existing supply chain strengths and challenges, ensuring inclusive and diverse participation in offshore wind development, global market trends, exploring models that can optimize local participation and benefits, and taking stock of existing programs that support local business development.

Supply Chain Strengths and Challenges

As Nova Scotia embarks on developing a strategy for offshore wind supply chain development, an important step is to establish a baseline of existing strengths and challenges. Through targeted engagement with Nova Scotia suppliers, Mi'kmaw organizations, communities, economic development organizations, and other groups, a high-level summary of strengths and challenges was established as a starting point to base strategic direction and future actions.

Key Strengths

- **Relevant and transferrable experience from other sectors:** Nova Scotia suppliers have capabilities that can service offshore wind development from decades of engagement in related sectors such as offshore oil and gas, defense, marine renewables, marine operations, and the overarching ocean technology sector. These include ocean science and technology companies, device/generator developers, power project developers, utilities, engineering and environmental consultants, manufacturers and fabricators, certification, insurance, vessels, transportation, port facilities/services, and the research community. Many local businesses also have experience from supporting the offshore oil and gas industry, having provided much of the engineering, seismic survey, modeling, forecasting, production and processing underwater intervention support during the Sable Offshore Energy Project and Deep Panuke Project. These established skills, experience and technologies can be adapted and transferred to support offshore wind development.

- **Established offshore wind experience:** Numerous Nova Scotia businesses have already gained a breadth of experience in supporting offshore wind projects by providing services and supplies to the international market. In particular, several businesses are supporting offshore wind development in the United States and Europe by providing seabed characterization, environmental monitoring, professional and manufacturing services, and port infrastructure. This experience and business connections can be built upon to support future projects in Nova Scotia.
- **Existing port infrastructure:** Nova Scotia already has the advantage of existing port facilities and associated infrastructure that can support offshore wind manufacturing, marshalling, and operations and maintenance. Some ports in the province are also already gaining experience in servicing offshore wind by providing support for marshalling and laydown of offshore wind monopiles and components destined for the United States. With the ramp up of onshore wind developments in the Province, some ports have begun to adapt their infrastructure and business plans to service the onshore wind industry; investments that can be leveraged to support a future offshore wind industry. Investments could position ports for new work and compliment existing work for offshore wind, but the province is already well positioned for future development.
- **Strong, supportive training, research and innovation ecosystem:** Nova Scotia is home to ten universities and a comprehensive community college system, which have marine science, engineering, marine geomatics, geoscience, oceanography, or technology and trades programs, courses, and potential research activities that have and/or will likely contribute to support offshore wind development. Organizations such as the Centre for Ocean Ventures and Entrepreneurship (COVE) and Nova Scotia Community College's (NSCC) Nautical Institute can help support workforce development and supply chain innovation and growth through targeted training and programs focused on accelerating marine technology. Other institutions and organizations also have research facilities, resources, and expertise that could be applied to future project development such as the Bedford Institute of Oceanography, National Research Council Canada, Marine Renewables Canada, and Net Zero Atlantic.

Potential Challenges

As Nova Scotia embarks on offshore wind and the establishment of a robust supply chain, there will be a range of challenges to address. Some of these include:

- **Shortage of skilled workforce:** Workforce and labour shortages are creating challenges for industries across Canada. It is likely that Nova Scotia could experience this obstacle as it develops the offshore wind industry, which if not addressed proactively and early, could lead to project delays and missed offshore wind targets.

- **Global demand and competition for supply chain:** Offshore wind is growing rapidly around the world, with an estimated deployment of 30 GW per year forecasted to meet peak installation demand in 2030 and 80 GW per year to meet government-established deployment targets⁴. As a result of this exponential growth, there is increasing supply chain demand around the world. Offshore wind development in Nova Scotia, like everywhere else, will likely face competition in securing various components, vessels, and other supply chain inputs. This can result in project delays and impact project contracts and costs.
- **Supply chain gaps:** While Nova Scotia has the advantage of a skilled and experienced offshore and maritime supply chain, there may be requirements that the province has neither the capabilities nor capacity to meet. This may include elements like turbine and subsea cable supply, specialized vessels, and labour supply. This is common in all jurisdictions; it requires a proactive strategy to identify areas of competitive advantage, opportunities to grow and adapt capabilities, and an understanding of necessary imports.
- **Regulatory complexity and red tape:** Suppliers are required to adhere to numerous regulatory requirements in the offshore. If not coordinated and streamlined by regulators, some regulations can create significant cost and time burdens for businesses to overcome. At this early stage in industry development when regulations and legislation are still under development, suppliers and regulators may not all share a clear and consistent understanding of what standards and rules must be met to ensure regulatory compliance. Government will work with regulators and industry to understand the intention of the regulations and rules to ensure we optimize local opportunities in a safe, inclusive, and environmentally minded manner.

Inclusive, Diverse, and Equitable Participation

Offshore wind development in Nova Scotia presents new opportunities for many different groups and communities. Establishing an inclusive, diverse, and equitable offshore wind supply chain will be critical to the success of the industry, and to ensuring that industry development benefits all Nova Scotians. The Province of Nova Scotia is committed to advancing the principles of equity, diversity, inclusion, and accessibility, and to pursuing reconciliation with the Mi'kmaq of Nova Scotia. It will be important for Nova Scotian communities, including Mi'kmaw communities, individuals and organizations that represent African Nova Scotians and Persons of African Descent, and members of other underrepresented and underserved communities, to participate meaningfully in offshore wind development.

⁴ Wood MacKenzie. "Cross currents: Charting a sustainable course for offshore wind." (August 2023) <https://www.woodmac.com/horizons/cross-currents-charting-a-sustainable-course-for-offshore-wind/>

Global Technology Trends and Innovation

As the offshore wind sector progresses globally, there has been a trend in scaling up the size of turbines (see Figure 4). This results in projects requiring fewer turbines to produce the same amount of power compared to earlier projects using smaller turbines. This continued growth can help achieve efficient operations and lower project costs, but it can also lead to supply chain challenges. For example, one of the results of turbines with larger dimensions is a lack of vessels that can accommodate the increased size for transport.

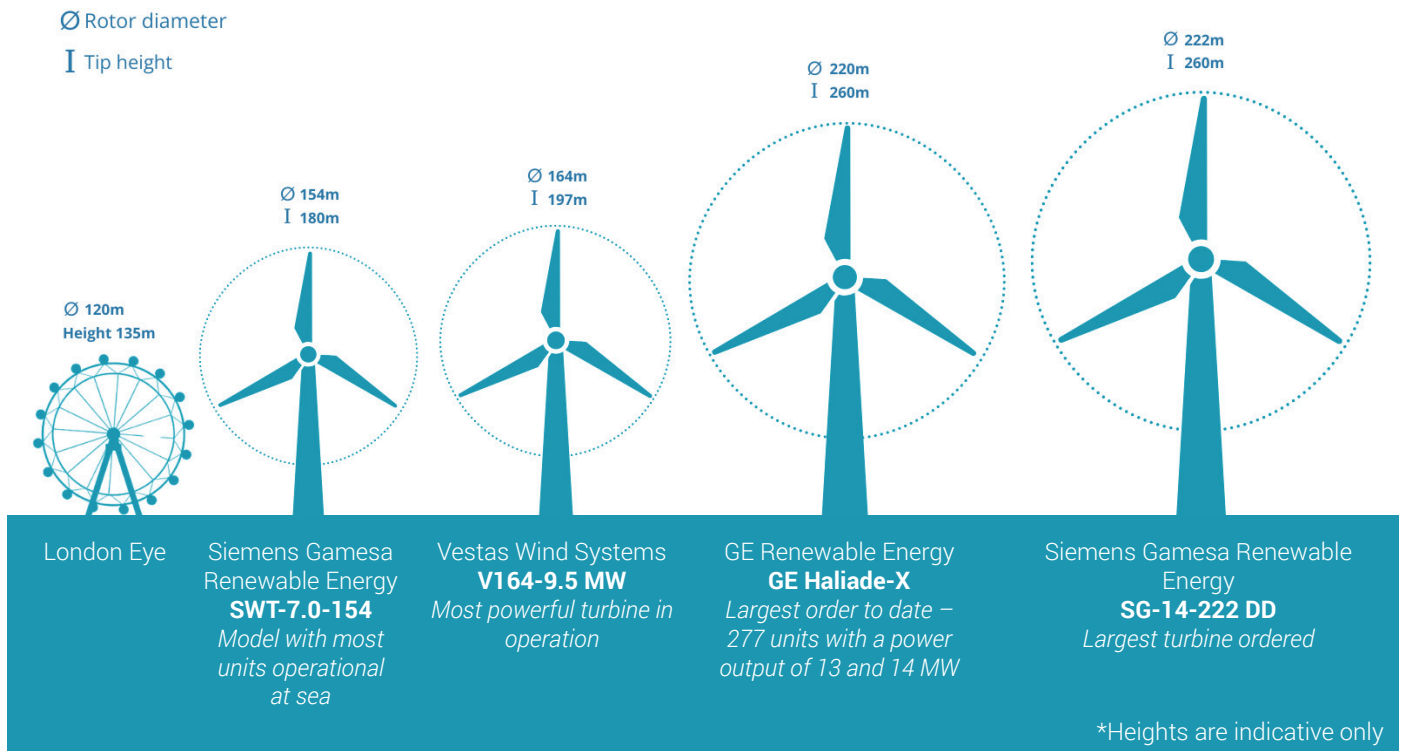


Figure 4 Evolution of Offshore Wind Turbine Technologies (adapted from WindEurope)⁵

Floating offshore wind technology is also becoming increasingly attractive as it can help harness offshore wind resource potential in water depths over 60 metres, offering further offshore wind potential. The use of floating vs. fixed offshore wind has implications for the supply chain as there are differences in requirements for ports, components, and other supply chain inputs.

⁵ WindEurope. "A 2030 Vision for European Offshore Wind Ports: Trends and Opportunities." (2023) <https://windeurope.org/intelligence-platform/product/a-2030-vision-for-european-offshore-wind-ports-trends-and-opportunities/>

Models to Optimize Local Participation and Benefits

Jurisdictions developing offshore wind have established a range of models and tools to support supply chain growth and secure local economic benefits. Several models that have been used in the United Kingdom, a leading jurisdiction in offshore wind, are illustrated in Figure 5.

	Description of mechanism	Merits
Direct local supply chain development	<ul style="list-style-type: none"> Projects may have firm or soft targets for utilization of local supply chain across the project life-cycle 	<ul style="list-style-type: none"> Provides clear guidance of expectations to be fulfilled by the project developer Ensures desired outcome May target specific supply chain elements
Indirect local supply chain benefits	<ul style="list-style-type: none"> Non-mandated creation of jobs through regional supply chain involving local businesses and infrastructure Some developers highlight the significance of indirect benefits in addition to community benefit arrangements while others only emphasize the role of indirect benefits 	<ul style="list-style-type: none"> Developers can steer and prioritize the engagement of local businesses Benefits are spread more widely
Community funds	<ul style="list-style-type: none"> Developers pay into a particular fund arranged around an offshore wind project Fund may be administered by the developer, authority or community Mechanisms of funds are usually established in consultation with affected and benefiting communities 	<ul style="list-style-type: none"> Easy for developer to arrange through third party fund managers Possibility of administration of funds through community groups allowing community to decide how funds are spent
Apprenticeships and internships	<ul style="list-style-type: none"> Benefit schemes that provide funding for education as well as skills and training Commonly connected to required skills in the offshore wind sector or green transition 	<ul style="list-style-type: none"> Helps build local capacity and capabilities
Education and training programs	<ul style="list-style-type: none"> Presentations and workshops in schools or colleges Encouraging and providing specific skills and knowledge for careers in the renewable energy sector Investment in equipment and infrastructure that will support training programs 	<ul style="list-style-type: none"> Raises awareness Comparatively easy to establish and implement Creates modern environments in which students can be recruited and trained to work in the the sector

Figure 5 Adapted from 2021 report by Aegir Insights [“Stimulating Offshore Wind Development in Nova Scotia”](#)

Individual states in the United States have also adopted similar tools and significant measures have been taken by federal and state agencies to embed local content requirements and incentives within their criteria for developing large renewable energy projects, as evident in the Inflation Reduction Act, federal wind lease sales, state-level power purchase agreements and grants and tax incentives.

As the Province of Nova Scotia advances its strategy for offshore wind supply chain development these types of models will be further explored and analyzed to determine suitability for the Nova Scotia context, estimated benefits, and potential drawbacks.

Existing Supports for Supply Chain and Workforce Development

There are a range of programs, guidance, funding and education through various existing organizations in Nova Scotia (see Figure 6). These efforts help businesses who either want to get involved in the offshore wind sector, or who are already involved and want to build capacity, upskill, or further advance technologies and services. This strong ecosystem of associations, educational institutions, technology and business accelerators, and government can play a role in supporting growth of the offshore wind supply chain and workforce.

Building on existing assets that are designed for renewables and marine training will enable Nova Scotia to ramp up quickly and optimize the return on public investments.

Business and Economic Development Ecosystem in Nova Scotia

GOVERNMENT	INDUSTRY & TECHNOLOGY	EDUCATION & TRAINING	ECONOMIC DEVELOPMENT
<ul style="list-style-type: none"> • Atlantic Canada Opportunities Agency • Department of Natural Resources and Renewables • Invest Nova Scotia • Other government departments where appropriate • Municipalities 	<ul style="list-style-type: none"> • Canadian Manufacturers and Exporters • Canada's Ocean Supercluster • Centre of Ocean Ventures and Entrepreneurship (COVE) • Marine Renewables Canada • Ocean Technology Council of Nova Scotia 	<ul style="list-style-type: none"> • Nova Scotia Community College • Other Nova Scotia academic institutions • Private and Industry Training Companies • Department of Labour, Skills and Immigration 	<ul style="list-style-type: none"> • Community Business Development Corporations • Regional Enterprise Networks • Chambers of Commerce

Figure 6 Examples of existing organizations and institutions in Nova Scotia that play a direct role in business and economic development.

6. Our Strategy to Facilitate Supply Chain Growth and Enhance Local Benefits

The Province of Nova Scotia has developed twelve early actions to address supply chain and infrastructure growth at this early stage in offshore wind sector development, focused on four key pillars.

Cultivate Local Capabilities and Capacity to Meet Industry Needs

With a strong ocean sector supply chain already established, the Province will work towards adapting, growing, and enhancing skills and services to support offshore wind projects. Careful consideration must also go towards how to build the local supply chain without creating competition between local industries for services, supplies, and labour. The Province of Nova Scotia will take the following actions at this early stage in industry development to grow and support the local supply chain:

- 1. Assess Local Supply Chain Strengths, Gaps and Analyze Needs:** At this stage in offshore wind industry development it will be important to assess the scope of a domestic supply chain, the timeframes needed to build critical resources, the level of investment required, the potential benefits to local workers and communities, and the significance of gaps in the existing suppliers/services (e.g. manufacturing, port, vessels, workforce, etc.). Therefore, a robust analysis of regional supply chain strengths and gaps is integral to successful industry development and ensuring local economic benefits. *The Province of Nova Scotia is working with the Atlantic Canada Opportunities Agency, Marine Renewables Canada, and other partners to conduct a study over the next year to better understand supply chain demand. This will assess existing strengths and gaps in the Atlantic region, resulting in recommended actions to facilitate local supply chain development.*

Consideration will also go towards understanding how existing industries may benefit from offshore wind development. For example, in the United States and United Kingdom, governments led initiatives to determine how offshore wind could present opportunities for mariners, particularly those working in the fishing industry, during times when they may not be actively working in their primary industry. In many offshore wind jurisdictions, the fishing industry has been hired in off-seasons for liaison positions, and fishing vessels are often used for surveys, scientific data collection, and as scout vessels to prevent conflict between offshore wind activities and vessel traffic or encounters with fishing gear. These types of opportunities will be explored further in close collaboration with fishing representatives and organizations, with an overarching intention to identify opportunities, but also ensure that they do not create competition for services, labour or equipment.

- 2. Provide Education and Information on Supply Chain Opportunities:** While some Nova Scotia businesses are already involved in offshore wind supply chain development, others are not and likely have questions about how they can participate in future projects. *The Province will collaborate with various entities already involved in supporting Nova Scotian businesses and suppliers such as industry associations, regional economic development organizations, chambers of commerce, etc., to provide information, education, and knowledge tools on offshore wind. It will also work with these organizations to understand whether greater capacity or funding is required to support new program delivery and initiatives focused on offshore wind.*
- 3. Understand Workforce Demand and Skills Gaps:** Launching an offshore wind sector will require Nova Scotia to build a skilled workforce. As with other clean technology and clean energy sectors, attracting or cultivating enough workers with the right skills will be a challenge, but one that Nova Scotia is well-suited to meet. To ensure that the offshore wind development is not hampered by labour shortages, a more specific assessment is required. *The Province of Nova Scotia will work with relevant organizations to analyze offshore wind workforce needs and develop a tailored strategy to address future needs and build an inclusive and sustainable workforce that considers labour union interest in this emerging sector.*
- 4. Continue Supporting Local Supplier Engagement in International Markets:** Nova Scotia has already established a reputation as being a global leader in maritime and offshore sectors, with businesses having extensive capabilities in various ocean industries. Local suppliers have gained market intelligence, established relationships, and realized business opportunities through missions and initiatives led by organizations such as the Ocean Technology Council of Nova Scotia, Invest Nova Scotia, and Marine Renewables Canada with support and collaboration from the Province. *The Province of Nova Scotia will continue working with these organizations and others to support Nova Scotia supplier engagement in international offshore wind markets which will help build early partnerships and experience that can be applied to future domestic offshore wind projects.*
- 5. Promote Early Business Connections, Collaborations, and Partnerships:** The ability for Nova Scotia suppliers to build a profile and make connections in the offshore wind industry will be important for future business prospects. *The Province of Nova Scotia will work to promote connections, collaborations, and partnerships between Nova Scotian firms and developers with expertise and global opportunities, such as the international companies and developers currently working in Nova Scotia and international companies with complementary products and services to expand export opportunities. It will work closely to coordinate and optimize these activities with industry associations, community groups, and economic development organizations who are also focused on similar efforts.*
- 6. Collaborate to Support Skill Development and Innovation:** Building the supply chain and workforce for offshore wind in the province will require specialized training and upskilling. As a new industry for Nova Scotia, there may also be opportunities for supplier innovation to meet the needs of the evolving offshore wind sector. *Working closely with organizations like trade unions, industry associations, community colleges, certification bodies and skills training institutions, the Province of Nova Scotia will explore training and upskilling requirements, identify existing educational programs, and determine future education and training needs.*

Foster Inclusivity in Supply Chain Participation

Actions taken to develop the offshore wind supply chain must be aligned with the Province's values of equal opportunity and shared prosperity to ensure Mi'kmaw and African Nova Scotian businesses, as well as businesses in African Descent communities and other underrepresented and underserved groups have equitable access to opportunities in the industry. The Province of Nova Scotia will take the following actions to promote inclusivity, diversity, and equity in offshore wind supply chain development:

- 7. Collaborate with Mi'kmaw Organizations to Deliver Information About the Offshore Wind Supply Chain:** To ensure equitable access to offshore wind supply chain opportunities, Mi'kmaw businesses and communities need to receive information about the offshore wind supply chain and how they can participate. *The Province will collaborate with industry, other relevant organizations, and Mi'kmaw communities, and in particular, Economic Development Officers within those communities, to provide timely and informative tools for learning about offshore wind supply chain opportunities.*
- 8. Facilitate Opportunities for Collaboration and Partnership:** Various Mi'kmaw businesses have expertise and technologies that are already well suited to support offshore wind development. Ensuring that these suppliers build a profile and make connections in the offshore wind industry will be important for future business prospects. *The Province of Nova Scotia will work collaboratively with other organizations to amplify the capabilities of Mi'kmaw suppliers and to share information such as Mi'kmaw business directories and listings with the offshore wind industry and suppliers.*
- 9. Work with Mi'kmaw, Rural, and other Diverse Communities to Understand and Support Opportunities:** Several communities throughout Nova Scotia have assets, infrastructure, and businesses that could play a role in supporting offshore wind development. *The Province will work closely with local government and communities throughout future engagement processes to communicate potential opportunities, provide clarity, build capacity for engagement, identify local concerns, and needs such as accessibility and training, and identify solutions.*

Prepare Port Infrastructure for Future Industry Requirements

Nova Scotia is fortunate to have port infrastructure that gives it a strategic advantage for offshore wind. Ports in the province have already been supporting marshalling needs for United States offshore wind projects and many are well suited to support domestic projects. The Province is committed to optimizing opportunities for local ports through offshore wind development and will take the following early action:

- 10. Assess Existing Port Infrastructure and Consider Future Demand:** With domestic offshore wind opportunities now on the horizon, consideration will need to go towards how Nova Scotia ports can meet the demands of these projects including manufacturing, marshalling, assembly, integration of components and ongoing operations and maintenance activities. *Invest Nova Scotia has undertaken updates to a province-wide asset map of port and marine infrastructure. Invest Nova Scotia conducted site visits with port facilities across the province to discuss current assets and capabilities and will provide the Province with updated intelligence to support long-term offshore wind energy development.*

Some Nova Scotia communities are conducting their own infrastructure assessments to better understand how they can optimize their participation in future opportunities. With funding support from the Province and ACOA, the Municipality of the County of Richmond has undertaken a Sustainable Infrastructure Strategy for the Strait of Canso. This project will evaluate best-use strategies for port facilities, transportation and industrial infrastructure, and other assets to consider existing and emerging renewable energy industries (including offshore wind).

Work is also underway by Net Zero Atlantic to conduct a port infrastructure study in 2024, with the intention of assessing port feasibility in Atlantic Canada, to support offshore wind requirements and establish an understanding of potential port investments needed to meet demand.

Facilitate Market Access and Local Benefits

Achieving optimal growth of the local supply chain requires a thoughtful approach to how offshore wind project activities are regulated and the strategies developed to spur economic benefits. The Province of Nova Scotia will take the following actions to ensure regulatory coordination and optimize opportunities for local suppliers, workforce, and infrastructure:

- 11. Promote Regulatory Coordination and Efficiency for Suppliers:** Suppliers working in the offshore will be required to follow and comply with numerous regulations and at this early stage, those regulatory requirements are not yet clear. The Province of Nova Scotia has been working closely with Natural Resources Canada and Canada-Nova Scotia Offshore Petroleum Board (that will become the Canada-Nova Scotia Offshore Energy Regulator under the amended Accord Acts) to develop a regulatory framework for offshore wind. *As part of this work, the Province will work with industry, suppliers, and government counterparts to understand potential challenges under new regulations and help provide guidance and clarity on regulatory requirements for providing services and supplies to offshore wind projects. Efforts will also go towards advocating for coordinated regulatory approaches that avoid duplicative processes and red tape, while optimizing benefits to Nova Scotia businesses.*
- 12. Explore Models and Approaches to Optimize Local Benefits:** With its history in offshore oil and gas, Nova Scotia is familiar with how offshore industry activity can benefit local businesses, communities, and the economy as a whole. Offshore wind also presents numerous opportunities and benefits for the province and a coordinated, thoughtful approach is required to optimize its potential. This can include mechanisms like local benefit plans, community funds, as well as local content requirements. *As the Province works to develop an offshore wind market and regulatory framework, it will also work closely with industry, suppliers, Indigenous groups, communities, and other interested parties to determine models that will provide optimal benefits from offshore wind development to all Nova Scotians.*

7. Summary of Early Strategic Actions

Cultivate Local Capabilities and Capacity to Meet Industry Needs

- 1. Assess Local Supply Chain Strengths, Gaps and Analyze Needs:** The Province of Nova Scotia is working with the Atlantic Canada Opportunities Agency, Marine Renewables Canada, and other partners to conduct a study over the next year to better understand supply chain demand. This will assess existing strengths and gaps in the Atlantic region, resulting in recommended actions to facilitate local supply chain development.
- 2. Provide Education and Information on Supply Chain Opportunities:** The Province will collaborate with various entities already involved in supporting Nova Scotian businesses and suppliers such as industry associations, regional economic development organizations, chambers of commerce, etc., to provide information, education, and knowledge tools on offshore wind. It will also work with these organizations to understand whether greater capacity or funding is required to support new program delivery and initiatives focused on offshore wind.
- 3. Understand Workforce Demand and Skills Gaps:** The Province of Nova Scotia will work with relevant organizations to analyze offshore wind workforce needs and develop a tailored strategy to address future needs and build an inclusive and sustainable workforce that considers labour union interest in this emerging sector.
- 4. Continue Supporting Local Supplier Engagement in International Markets:** The Province of Nova Scotia will continue working with Ocean Technology Council of Nova Scotia, Invest Nova Scotia, Marine Renewables Canada, and others to support Nova Scotia supplier engagement in international offshore wind markets which will help build early partnerships and experience that can be applied to future domestic offshore wind projects.
- 5. Promote Early Business Connections, Collaborations, and Partnerships:** The Province of Nova Scotia will work to promote connections, collaborations, and partnerships between Nova Scotian firms and developers with expertise and global opportunities, such as the international companies and developers currently working in Nova Scotia and international companies with complementary products and services to expand export opportunities. It will work closely to coordinate and optimize these activities with industry associations, community groups, and economic development organizations who are also focused on similar efforts.
- 6. Collaborate to Support Skill Development and Innovation:** Working closely with organizations like trade unions, industry associations, community colleges, certification bodies and skills training institutions, the Province of Nova Scotia will explore training and upskilling requirements, identify existing educational programs, and determine future education and training needs.

Foster Inclusivity in Supply Chain Participation

- 7. Collaborate with Mi'kmaw Organizations to Deliver Information About the Offshore Wind Supply Chain:** The Province will collaborate with industry, other relevant organizations, and Mi'kmaw communities, and in particular, Economic Development Officers within those communities, to provide timely and informative tools for learning about offshore wind supply chain opportunities to Mi'kmaw businesses and communities.
- 8. Facilitate Opportunities for Collaboration and Partnership:** The Province of Nova Scotia will work collaboratively with other organizations to amplify the capabilities of Mi'kmaw suppliers and to share information such as Mi'kmaw business directories and listings with offshore wind industry and suppliers.
- 9. Work with Mi'kmaw, Rural, and other Diverse Communities to Understand and Support Opportunities:** The Province will work closely with local government and communities throughout future engagement processes to communicate potential opportunities, provide clarity, build capacity for engagement, identify local concerns, and needs such as accessibility and training, and identify solutions.

Prepare Port Infrastructure for Future Industry Requirements

- 10. Assess Existing Port Infrastructure and Consider Future Demand:** Invest Nova Scotia has undertaken updates to a province-wide asset map of port and marine infrastructure. Invest Nova Scotia conducted site visits with port facilities across the province to discuss current assets and capabilities and will provide the Province with updated intelligence to support long-term offshore wind energy development. Work is also underway by Net Zero Atlantic to conduct a port infrastructure study in 2024, with the intention of assessing port feasibility to support offshore wind requirements and establish an understanding of potential port investments needed to meet demand. Some Nova Scotia communities are conducting their own infrastructure assessments to better understand how they can optimize their participation in future opportunities.

Facilitate Market Access and Local Benefits

- 11. Promote Regulatory Coordination and Efficiency for Suppliers:** The Province will work with industry, suppliers, and government counterparts to understand potential challenges under new regulations and help provide guidance and clarity on regulatory requirements for providing services and supplies to offshore wind projects. Efforts will also go towards advocating for coordinated regulatory approaches that avoid duplicative processes and red tape while optimizing the benefits to Nova Scotia businesses.
- 12. Explore Models and Approaches to Optimize Local Benefits:** As the Province works to develop an offshore wind market and regulatory framework, it will also work closely with industry, suppliers, Indigenous groups, communities, and other interested parties to determine local benefits models that will provide optimal benefits from offshore wind development to all Nova Scotians.

Nova Scotia Offshore Wind Roadmap
Module 2: Supply Chain & Infrastructure
June 2024

ISBN: 978-1-77448-661-0

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