

2021



Blue Economy Strategy

Your oceans • Your voice • Your future

ENGAGEMENT PAPER



Canada 

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Foreword from the Minister

Canada is an ocean nation. Our oceans are tightly woven into the economic, social, and cultural fabric of this country. They have been a source of food, jobs, transportation, and recreation for generations. They are the life force of our coastal communities and our connection to diverse cultures across the globe. For centuries, they have charted paths for exploration and new scientific discoveries. Today, our oceans present countless new opportunities, and we want to help Canadians harness them.



Canada is a leader on the world stage when it comes to ocean conservation and protection, and the same should be true of the global blue economy. Thriving ocean economies depend on sustainable, healthy oceans. Canada's ocean economy accounts for \$31.7 billion annually in gross domestic product and almost 300,000 jobs in fisheries, aquaculture, energy, shipping, tourism and recreation. As we look ahead to the post-pandemic world, we want to consciously create more jobs and opportunities in our coastal and Indigenous communities. The Government of Canada is developing a Blue Economy Strategy to grow and modernize our ocean sectors in a sustainable way. Together, we are building a plan to get more Canadians working on and in the water.

A blue economy is one that creates meaningful middle-class jobs while prioritizing the health of our oceans. It supports innovation and pushes Canada to the forefront of the development of new and ground-breaking technologies. It harnesses the latest scientific findings and best practices, while steadily building prosperity and conserving our oceans for future generations. This engagement paper outlines some of the opportunities, challenges, and gaps facing our ocean economy. It includes a series of questions that I invite readers to reflect upon as you provide input into the development of Canada's Blue Economy Strategy.

On behalf of the federal Government, I thank you for your participation and engagement as Canada looks forward to seizing the many opportunities that lie before us and working together to solve common challenges.

The Honourable Bernadette Jordan, M.P., P.C.

Minister of Fisheries, Oceans and the Canadian Coast Guard





Introduction

Our three oceans have shaped Canada's identity and the livelihoods of countless Canadians. They will continue to be a driving force in our economic development and revenue. But they are not a resource. Our oceans are an essential part of our natural environment and are integral to many Indigenous and non-Indigenous cultures and ways of life.

Today, Canada's ocean economy is being challenged by the global pandemic. The health of the world's oceans is also under increasing pressure from overexploitation, pollution, and climate change. Growing the ocean economy therefore requires a comprehensive approach and steadfast commitments to ocean protection as well as production and prosperity. **This is a sustainable blue economy.**

Canada's vision for a sustainable blue economy will see the growth of ocean sectors through innovation. It will provide

good jobs and be inclusive, advance reconciliation with Indigenous peoples, respect regional differences and needs, and contribute to a clean and healthy ocean. A strong blue economy will also be an important part of our recovery from COVID-19 and our collective effort to build back better.

The Government of Canada will develop a strategic framework to guide future actions and investments that will help grow our ocean economy, while advancing our conservation objectives. This strategy aims to harness opportunities on all three coasts and position Canada as a leader in the global blue economy.

“
The World Bank defines the blue economy as “the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health.”
”

To ensure our blue economy strategy reflects the needs of Canadians, we are seeking your input on priority areas of action.

This engagement paper starts by exploring how a strategy could best support and advance the economic well-being of coastal and Indigenous communities, including by creating well-paying jobs and making our ocean sectors more inclusive. The second section probes seven ways to position our blue economy for growth and success, including challenges to overcome. Lastly, we examine each of our ocean sectors in depth, along with a few future-oriented and emerging sectors. All three sections of the paper suggest potential actions that a blue economy strategy could take and invite your responses to questions. At the end, we pose some ‘big

picture’ questions we welcome you to consider as we envision a stronger, more sustainable future.

Your input will ensure that Canada's Blue Economy Strategy responds to the regional and community-level needs of Canadians and the development of concrete initiatives. Submissions may be sent by **June 15, 2021** via email to: BlueEconomy-EconomieBleue@dfo-mpo.gc.ca or by standard mail (refer to *How to reach us* at the end of this document).

Thank you for your interest and participation.

Context

In the 2020 Speech from the Throne, the Government of Canada articulated its plan for economic transformation post-COVID-19: addressing socio-economic gaps, building a stronger workforce, fighting climate change, and remaining committed to sustainable economic growth.¹ These broad objectives form a resiliency agenda to “build back better.” The development of a blue economy strategy is a key component of this plan. This is how we will steer Canada’s ocean-based economy towards a more sustainable future and “build back bluer.”

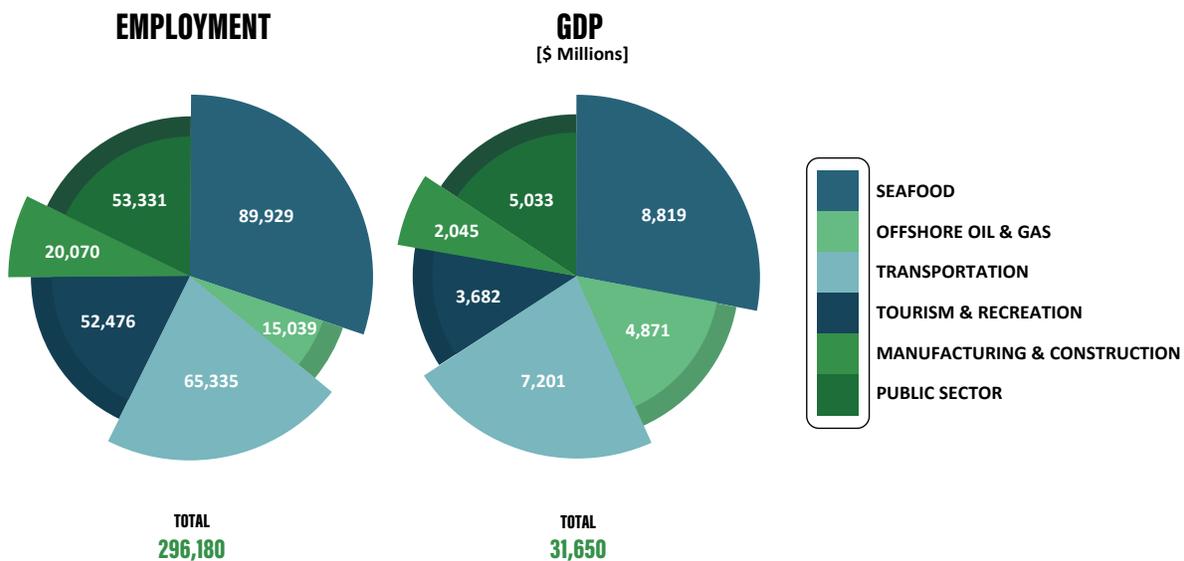
Growing Canada’s blue economy requires sustainable business practices that recognize ocean health is directly linked to long-term economic value creation. Long-term prosperity can only be achieved through strong, consistent efforts to protect and conserve ocean spaces and minimize the impacts of human activities on marine environments. In fact, as the largest natural carbon sink on the planet, our oceans can support Canada in its efforts to lower

greenhouse gas emissions and mitigate the impacts of climate change.

Canada’s blue economy is an important part of regional economies and the broader national economy. Our ocean sectors have the potential to drive sustainable economic growth and support the creation of more jobs in coastal and Indigenous communities while advancing innovation.

Our blue economy consists of traditional ocean-based sectors such as commercial fishing, aquaculture, seafood processing, marine shipping, port activities, shipbuilding, and coastal tourism. It also includes emerging industries and activities driven by cutting-edge developments in science and technology, such as offshore energy and marine biotechnology. In 2016, Canada’s blue economy contributed 1.6 per cent to our total employment and gross domestic product (GDP), generating 296,180 jobs and \$31.7 billion in GDP.

Blue Economy Total Employment and GDP by Sector, 2016²



¹ www.canada.ca/content/dam/pco-bcp/documents/pm/SFT_2020_EN_WEB.pdf ² Total figures may not add up due to rounding.

Gross Domestic Product Contribution to Provincial and Territorial Economies, 2016³

Province/ Territory	Ocean Sector GDP [\$ MILLIONS]	Provincial/ Territorial GDP [\$ MILLIONS]	Share of Provincial/ Territorial GDP [%]
Newfoundland and Labrador	6,434	31,696	20.3%
Prince Edward Island	599	6,348	9.4%
Nova Scotia	4,626	41,492	11.2%
New Brunswick	1,433	34,593	4.1%
Quebec	2,509	397,291	0.6%
British Columbia	8,769	263,978	3.3%
Yukon	106	2,715	3.9%
Northwest Territories	270	4,603	5.9%
Nunavut	142	2,513	5.7%
MARITIME REGIONS	24,889	785,229	3.2%
CANADA	31,650	2,023,824	1.6%

Source: Fisheries and Oceans Canada based on Statistics Canada 2015 Input-Output multipliers and industry gross output, and on a customized Statistics Canada Input-Output model run for three of the underlying industries (www.dfo-mpo.gc.ca/stats/maritime/tab/mar-tab2-eng.htm)

Employment Contribution to Provincial and Territorial Economies, 2016

Province/ Territory	Ocean-based Employment [# OF JOBS]	Provincial/ Territorial Employment [# OF JOBS]	Share of Provincial/ Territorial Employment [%]
Newfoundland and Labrador	28,001	232,600	12.0%
Prince Edward Island	7,077	71,500	9.9%
Nova Scotia	49,998	446,200	11.2%
New Brunswick	19,427	351,500	5.5%
Quebec	28,768	4,133,100	0.7%
British Columbia	93,429	2,379,500	3.9%
Yukon	952	20,200	4.7%
Northwest Territories	1,543	22,500	6.9%
Nunavut	694	13,500	5.1%
MARITIME REGIONS	229,888	7,670,600	3.0%
CANADA	296,180	18,079,900	1.6%

Source: Fisheries and Oceans Canada based on Statistics Canada 2015 Input-Output multipliers and industry gross output, and on a customized Statistics Canada Input-Output model run for three of the underlying industries (www.dfo-mpo.gc.ca/stats/maritime/tab/mar-tab5-eng.htm)

³ Ibid

The ocean sectors concentrated in Atlantic Canada, Quebec, and British Columbia are essential to these regional economies. For instance, marine shipping, offshore oil and gas, fish and seafood processing, commercial fishing, Indigenous fisheries and traditional livelihoods, shipbuilding, and aquaculture are some of the most important sectors within Atlantic Canada and Quebec. The ocean technology sector in Atlantic Canada is also driving innovation across ocean sectors with its industrial, technical, and scientific diversity.



In British Columbia, primary ocean sectors include marine shipping, recreation and tourism, aquaculture, commercial fishing, Indigenous fisheries and traditional livelihoods, and fish and seafood production, as well as a growing ocean technology sector. Farmed salmon is particularly important as the top seafood and agri-food export in the province. The Pacific Ocean also offers direct trade links to Asia and the broader Pacific Rim, which present a key opportunity for Canada to expand its exports and global market access.

Canada's Arctic region is an increasingly important part of the blue economy. Activities in our Arctic Ocean are expanding as a result of land-based natural resource exploration, Indigenous fisheries and traditional livelihoods, increased access for shipping vessels, and unique tourism experiences. These sectors could lead to new opportunities for Indigenous and northern communities.

The economic activity driven by Canada's ocean-based sectors support strong value chains along all three coasts as well as inland. Indeed, the blue economy is connected to

economic activities stemming from other waterways and industries, including the Great Lakes, Hudson's Bay, and the St. Lawrence Seaway.

Canada is home to excellent post-secondary and government institutions that are conducting world-leading oceans-related science and research. From the Ocean Frontier Institute in Atlantic Canada to the Institute for the Oceans and Fisheries in British Columbia, Canadians continue to benefit from scientific discoveries and research developments that support our ocean conservation efforts. This includes ocean data collection and management, and other groundbreaking ocean technologies, that are being developed by Ocean Networks Canada alongside industry.

Modernization and digitalization are also driving Canada's ocean sectors to make structural changes. Artificial intelligence, automation, robotics, ocean sensing, big data, and better data acquisition and analysis are all impacting how ocean resources are used. These technologies can also offer solutions to some of the most pressing environmental challenges we face today. One thing is certain—technology modernization and business innovation are essential to building a strong blue economy. They will drive the future growth of our ocean sectors and help us integrate economic and environmental goals in a mutually supportive way.

Canada's ocean sectors have grown steadily over a number of years and this is expected to continue. Prior to the global pandemic, the Organisation for Economic Cooperation and Development estimated that the total value-added of the global ocean economy could increase to \$4 trillion by 2030, effectively doubling 2010 levels. Canada is very well-positioned to benefit from this global growth trajectory. To remain so, our strategy must be anchored in environmental and business practices that support sustainability, protect ocean resources, and improve overall ocean health.

To ensure Canadians benefit from a sustainable blue economy, the Government has already launched initiatives to support ocean-based sectors while conserving and protecting oceans and coastal areas. Investments in industries include the Ocean Supercluster, three regional fisheries and Oceans Canada, the Transport Canada

Innovation Center, and the Natural Resources Canada Energy Innovation Program. Investments in ocean protection and conservation include the \$1.5 billion Oceans Protection Plan—the single largest investment ever in Canada’s oceans—and strong actions to ensure that Canada met its 10 per cent international marine conservation target in 2020.

These and other investments were in place before the global pandemic changed the world’s economy. When COVID-19 began to impact Canada, the Government moved quickly to launch new programs to help individuals and companies adapt to new health and security realities, continue operating, and build greater resiliency. This includes direct support to Canada’s fish and seafood sector of up to \$469.4 million through the Fish Harvester Benefit and Grant Program and \$62.5 million through the Canadian Seafood Stabilization Fund. It also includes \$320 million towards an agreement with the Government of Newfoundland and Labrador to support Canadians with offshore energy jobs and up to \$2 billion through the Regional Relief and Recovery Fund to help businesses and communities cope with the impacts of the pandemic—25 per cent of which is earmarked for the tourism sector.

Going forward, dedicated efforts to support the blue economy will be central to Canada’s economic recovery. The 2020 Speech from the Throne reiterated the federal commitment to develop a blue economy strategy as follows:

“...the Government will look at continuing to grow Canada’s ocean economy to create opportunities for fishers and coastal communities, while advancing reconciliation and conservation objectives. Investing in the Blue Economy will help Canada prosper.”

To achieve this commitment, we are engaging and collaborating with the provinces and territories, Indigenous groups, businesses and other stakeholders, and the public. This includes involving our partners, industry, and all Canadians in identifying practical solutions to support economic recovery, long-term prosperity, and ocean health. It also means taking a coast-to-coast-to-coast approach that considers regional differences, preferences and challenges, while respecting other jurisdictions.



Future activities in our ocean spaces will reflect Canada’s international commitments to sustainable development and align with recommendations developed by the High Level Panel for a Sustainable Blue Economy, of which our Prime Minister is a member. This includes implementing sustainable ocean plans and sustainably managing 100 per cent of ocean areas under national jurisdiction by 2025.

Canada’s commitment to a healthy and prosperous ocean economy is also reinforced in our strengthened climate plan, *A Healthy Environment and a Healthy Economy*. It recognizes that “climate change is the biggest long-term threat of our generation, but it is also the greatest economic opportunity.”⁴ By accelerating action to fight climate change while building a more sustainable and resilient blue economy, we will create new jobs and opportunities for Canadians, incentivize innovation, and protect our oceans for the long-term. Our blue economy strategy must help foster the growth of our marine clean technology sector, help Canada’s ocean companies reduce carbon emissions faster, improve the global competitiveness of clean ocean industries, and build Canada’s clean industrial advantage.

Canada is in an unparalleled position to harness our ocean assets and strengths in ways that will maximize all the opportunities a sustainable ocean economy has to offer. This will require a clear vision and a strategy to guide us toward it. The Blue Economy Strategy will set Canada on a course to achieve greater resilience through new business models and innovations that drive ocean health with economic prosperity at once, together. This is how we will get more Canadians working on and in the water. This is how we will position Canada as a leader in the global, sustainable, blue economy.

⁴ www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf

Focusing Canada's Blue Economy on Growth and Prosperity for All

Canada's blue economy has real potential to generate new opportunities for sustainable growth and prosperity. We also have an opportunity to "build back better" as our ocean industries work to recover from the COVID-19 pandemic. This requires a blue economy strategy that supports and advances the economic well-being of as many Canadians as possible; especially, Indigenous peoples and other underrepresented groups.

This part of the engagement paper focuses on three key ways that our blue economy strategy can foster more prosperity and inclusion in Canada's ocean sectors:

- Advancing the participation of Indigenous peoples
- Developing the necessary labour force and skills
- Identifying barriers to inclusive growth

Each section highlights major challenges, suggests ways that a blue economy strategy could help address these challenges, and poses questions for you to consider answering. Your feedback and ideas will help guide the development of this Strategy.





Advancing the Participation of Indigenous Peoples

In recent years, the Government of Canada has worked to renew and rebuild its relationship with Indigenous peoples based on the recognition of rights, respect, co-operation, and partnership. It has also undertaken work to advance reconciliation and make much-needed investments to close the socio-economic gaps that First Nations, Inuit, and Métis peoples face. Indigenous peoples understand the needs of their communities best and, therefore, Government has been working closely with Indigenous communities to advance their self-government, their self-determination, and their ongoing work of nation rebuilding. To that end, the Government recently proposed new legislation to implement the United Nations Declaration on the Rights of Indigenous Peoples. The legislation is a road map to advance lasting reconciliation with Indigenous peoples, and the steps that must be taken to respect, recognize, and protect their human rights and to address the wrongs of the past.

Oceans, fisheries, aquatic ecosystems, and marine waterways are integral to Indigenous rights, cultures, ways of life, and heritages. Marine resources and ecosystems also hold significant social, ceremonial, and economic importance to Indigenous peoples across Canada.

The Government is working to increase the participation of Indigenous peoples in the blue economy through non-treaty agreements and other program

Challenges:

- Access to training programs and capacity development to acquire knowledge and develop skills to expand on existing, and to leverage new, opportunities in ocean sectors can be limited in Indigenous communities.
- Limited private sector investments in Indigenous communities.
- Limited understanding by non-Indigenous investors, lenders, and potential project partners of Indigenous economies, business opportunities, culture, and political structures.



agreements. We are also providing direct support through dedicated commercial fisheries programs that have enabled Indigenous communities to increase the potential of their commercial fishing enterprises and strengthen community economic self-sufficiency. At the same time, the Government and Indigenous communities are collaborating to help restore coastal habitats, protect marine environments, and improve marine safety. This includes through scientific and technical watershed-based aquatic resource and oceans management departments that receive direct support from the Government.

Indigenous communities are valued partners in the growth of Canada's blue economy and our efforts to protect and conserve ocean spaces. Canada's Blue Economy Strategy has the potential to increase and diversify ocean-related economic opportunities for coastal Indigenous communities that are aligned with their values, priorities and aspirations. The co-development of a blue economy strategy is therefore an important opportunity to further reconciliation between Canada and Indigenous peoples.

As the economy reopens from the global pandemic, a blue economy strategy could further initiatives that are fostering job creation and sustainable economic opportunities along with a new conservation economy in Indigenous communities. This includes initiatives to build capacity and to facilitate ownership and market entry to help increase the participation of Indigenous peoples and communities in ocean sectors.



a BLUE ECONOMY STRATEGY could ...

- Facilitate the development of new ocean-based business opportunities, including the conservation economy, to diversify the economies and employment opportunities of Indigenous communities along the Arctic, Atlantic and Pacific oceans.
- Contribute to the adoption of Indigenous Knowledge into planning and decision-making to help achieve equitable, sustainable, and inclusive ocean economy sectors.
- Continue to support the development of partnerships with First Nation, Inuit, and Métis organizations and governments to build local marine safety and response capacity.
- Explore opportunities to support Indigenous entrepreneurship and increased participation of Indigenous peoples and communities in ocean-based sectors to help close the socio-economic gap between Indigenous and non-Indigenous coastal communities.
- Advance collaboration with Indigenous communities to continue to identify and support effective training models to equip Indigenous people with the skills and knowledge required to succeed in a modern blue economy.
- Explore opportunities to strengthen Indigenous blue economy procurement capacity.

Discussion questions:

- How can Indigenous peoples best be supported to increase their participation in the ocean economy?
- How can the Government collaborate with Indigenous communities to enable them to achieve their ocean-related economic development plans?
- What are the main barriers and challenges to increasing private sector ocean-related investments in Indigenous communities and for Indigenous communities and businesses to invest in ocean sectors?
- Do initiatives, such as the Indigenous Career Pivot Project organized by the Ocean Supercluster, help meet the needs of Indigenous communities to increase their participation in the blue economy?
- Are there best practices, pilot studies or programs related to Indigenous training and roles in the marine sector that could help facilitate the concept of an Indigenous conservation economy and inform future actions in this area?



Developing the Necessary Labour Force and Skills

The blue economy provides rewarding jobs and career opportunities for many Canadians. In 2016, employment in Canada's ocean sectors accounted for just under 300,000 jobs (1.6 per cent of our national employment total) and that number is poised to grow.

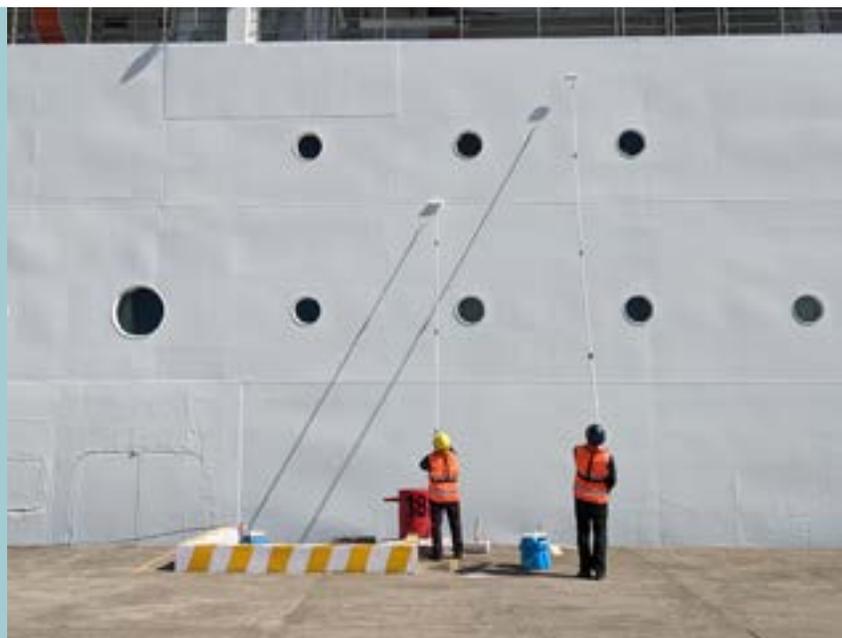
Diversity in Canada's blue economy depends on a range of skills and labour force talent. Traditional sectors, such as fishing and seafood processing, may rely more on skills such as machine operation and physical abilities, while knowledge-intensive sectors may require more Science, Technology, Engineering and Mathematics (STEM) related competencies. As ocean sectors evolve, the type and mix of skills will change to match trends, such as increased digitalization and automation, the emergence of newer and more knowledge-intensive sectors (e.g. marine renewables), and a growing focus on sustainability.

The Government is already working with the private sector to ensure that our blue economy sectors have access to a well-educated and skilled labour force. The National Shipbuilding Strategy Value Proposition, for example, requires Canada's shipyards to invest in the domestic marine industry, which may be directed to human resource development. This could enable the sector to have access to a pool of qualified personnel.

Canada's blue economy will continue to need skilled and talented workers to grow and realize its full potential. Many ocean sector companies already struggle to recruit and retain skilled employees. The approach to supply labour and provide skills development to Canadians and underrepresented people in the blue economy will be an essential component to grow a prosperous and competitive blue economy in Canada.

Challenges:

- An aging population in some sectors (e.g. fishing) and demographic shifts (e.g. growing Indigenous population) in coastal communities where people may not be drawn to ocean industries are key considerations for the future workforce of these sectors.
- Existing and anticipated labour shortages (e.g. in marine transport, processing, ocean technology) hinder companies from making long-term decisions and larger-scale investments.
- Lack of awareness of the opportunities in, as well as educational pathways to, Canada's ocean sectors.
- Cultivating the right types of skills for Canada's growing blue economy.
- Helping lower-skilled workers in traditional sectors (e.g. seafood processing) adapt to new workplace realities.





a BLUE ECONOMY STRATEGY could ...

- Work with provinces, territories, Indigenous governments and organizations, and industry to identify skills gaps hindering growth, as well as professional training and re-training opportunities.
- Co-operate with provinces, territories, Indigenous communities, industry, and post-secondary institutions to increase awareness of the opportunities in Canada's ocean sectors among youth and to identify and address recruitment and retention barriers.
- Explore opportunities for a more targeted immigration approach to help alleviate some skills and talent gaps in Canada's blue economy.
- Support the development of a skilled workforce capable of responding and adapting to the ongoing challenges related to digitalization and automation in ocean industries in order to further competitiveness.
- In co-operation with provinces, territories, Indigenous organizations and industry, explore the means to advance the transfer of knowledge and skills between various ocean industries, e.g. from offshore oil and gas to aquaculture and renewable energy.

Discussion questions:

- What actions could be taken to grow talent and develop the skills needed for ocean sectors?
- How can good quality employment opportunities in our blue economy be better promoted?
- How can underrepresented groups (e.g. women, Indigenous peoples, visible minorities, youth, and persons with disabilities) be encouraged and helped to develop ocean-related skills?
- How can the Government and private industry work and support traditionally underrepresented groups to eliminate barriers to effective recruitment and retention in ocean sectors?
- If you work in an ocean sector, what do you see as the current and pending skills and labour gaps?



Identifying Barriers to Inclusive Growth

Ocean resources have vast potential to unlock economic growth, reduce poverty, and improve lives and livelihoods; particularly, for women, youth, Indigenous peoples, visible minorities, and persons with disabilities. However, access to ocean resources and the distribution of its benefits are often inequitable. The COVID-19 pandemic has magnified inequities among gender, race, Indigeneity, physical ability, geographic location, rurality, ability, age, and socio-economic status. Any focus on economic growth must include a conscious effort to make our growing sectors more accessible to vulnerable groups.

Addressing inequities in ocean industries is an essential part of building a resilient and sustainable blue economy. An intersectional Gender-Based Analysis Plus (GBA+) lens will be applied to the development of initiatives that fall under the blue economy strategy in order to anticipate potential impacts on diverse groups of Canadians. By identifying issues early, the blue economy strategy will be positioned to help mitigate inequalities and promote equity in the ocean sector based on the issues brought forward.

There are many examples of Government and industry action on inclusive growth. The Atlantic Canada Opportunities Agency, for instance, has partnered with UGent and the Flanders Blue Ocean Cluster to immerse selected female graduate students in Atlantic Canada in leading edge ocean economy innovations. Oceans Network Canada has partnered with many coastal indigenous communities in British Columbia to initiate community-based monitoring, school programs, youth training, and engagement so that each community can advance its ocean and marine environment programs. More recently, Canada's Ocean Supercluster supported the launch of the Blue Future Pathways project to connect youth across Canada with education and employment opportunities, and to support participants in developing a successful career in the blue economy.

Furthering the work of existing blue economy initiatives could help improve livelihood of people in underrepresented groups and enable ocean sectors to grow. Over the longer term, Canada's blue economy must be more resilient and responsive to future economic uncertainties and impacts; especially, those that affect the most vulnerable groups who rely on Canada's oceans and their benefits.



Challenges:

- Ocean sectors are often perceived as male dominated, presenting a challenge for women who are interested in pursuing opportunities in those industries.
- Youth are often not aware of good employment opportunities available in ocean industries and do not look to build their career in ocean sectors.
- Each ocean sector faces its own inclusivity and diversity issues and there are no “one size fits all” solutions.





a BLUE ECONOMY STRATEGY could ...

- Help identify and address inequalities associated with ocean sectors.
- Identify actions that could address barriers preventing underrepresented groups from participating in the blue economy and ensure equitable distribution of benefits from the ocean.
- Support Indigenous governments, organizations and communities in identifying and leading the development of initiatives that could increase Indigenous participation in the blue economy.
- Identify actions to improve equity, inclusiveness, and diversity in Canada's blue economy.

Discussion questions:

- What barriers prevent some groups from fully participating in ocean sectors?
 - In which areas can strategic action be taken to support and improve equity, inclusiveness, and diversity in the blue economy?
 - What steps can the Government take to ensure that benefits from the blue economy strategy are equitably distributed?
 - How can the proportion of underrepresented groups in managerial and decision-making roles in ocean sectors be increased?
- 

Positioning Canada's Blue Economy for Growth and Success

Canada's blue economy is complex. It is made up of different sectors and competing interests, all of which are impacted by shifting market dynamics. The relationship between ocean sectors, various levels of government, evolving market access requirements, and international agreements and commitments adds further complexity.

To position Canada's ocean sectors for growth and success, a number of cross-cutting issues must be considered:

- the natural environment
- innovation
- financing
- science and data
- market access
- the business environment
- regulatory environment

This underscores Canada's need for a single, comprehensive strategy to guide our investments and policies toward a single, clear goal of a strong, sustainable blue economy.

This part of the engagement paper examines these seven issues in detail, identifying relevant challenges and suggesting potential ways that a blue economy strategy could be used to address these challenges. We encourage you to consider the discussion questions posed at the end of each section and provide your feedback to help guide the development of this Strategy.





Natural Environment:

Enhancing environmental sustainability of the ocean and climate change resilience of coastal areas

Canada's blue economy and its future growth depend on the sustainable use and management of our ocean resources. A healthy ocean generates economic and social benefits. At the same time, it performs vital functions such as carbon sequestration and climate regulation.

The health of the world's oceans is under pressure as a result of overexploitation, pollution, and climate change. The United Nations proclaimed 2021-2030 as a Decade of Ocean Science for Sustainable Development to support global efforts to reverse the decline in ocean health and create improved conditions for sustainable development in the ocean.

Climate change, in particular, significantly impacts the global ocean economy and the resilience of coastal areas worldwide. Canada's blue economy and Indigenous and non-Indigenous coastal communities are not immune to these impacts. Capture fisheries, aquaculture, and coastal tourism are also vulnerable.

The Government has taken important steps to keep Canada's oceans healthy and to help ocean industries adapt to the impacts of climate change. The \$1.5 billion Oceans Protection Plan, the modernized *Fisheries Act*, new marine protected areas, and our commitment to

protect 25 per cent of our oceans by 2025 while working towards 30 per cent by 2030, are a few such examples. The Government is also working closely with Indigenous communities on all three coasts to support coastal habitat restoration, protect marine environments, and improve marine safety. Additional steps, such as marine spatial planning activities will also help us balance human activities and conservation efforts in our ocean spaces.

In addition, the Government has been developing ocean accounts to help us better understand the total value that oceans bring to our society. Ocean accounts will contain ocean-related environmental, social, and economic data in a comprehensive way so we can determine whether investments in our oceans are building ocean wealth for future generations.

These domestic actions are helping Canada meet its international commitments to ocean health, including the Charlevoix blueprint for healthy oceans, seas and resilient coastal communities, the Ocean Plastics Charter, and Sustainable Development Goals. We are also demonstrating leadership regarding the sustainable use of marine resources, including in regional fisheries management organizations discussions on the importance of sustainable high seas fishing.



Challenges:

- Some capture fisheries in Canada are highly sensitive to climate variability which creates uncertainty for industries and regulators.
- Indigenous and non-Indigenous coastal communities are often dependent on a limited range of economic activities, thereby leaving them vulnerable to marine-related impacts of climate change.
- Climate change negatively impacts coastal infrastructure (e.g. storm surges, rising sea levels) and regions like the Arctic will likely be disproportionately impacted.
- Most issues related to ocean protection and sustainability are transboundary (e.g. ocean plastics, climate change, ocean acidification, and illegal, unreported and unregulated fishing) and require large-scale international co-operation to be addressed.





a BLUE ECONOMY STRATEGY could ...

- Support marine science to better understand the impacts of climate change on Canada's fisheries, Indigenous and non-Indigenous coastal communities, and the broader blue economy.
- Support marine science to better understand how protecting the marine environment could help to mitigate the impacts of climate change (i.e. exploring blue carbon potential).
- Explore ways to work with Canada's ocean industries to identify how they can be partners in providing solutions to advance ocean health.
- Identify means to support ocean industries for economic diversification and/or transition, as well as for climate change adaptation.
- Explore how nature-based solutions and/or hybrid engineering solutions can be used to enhance coastal protection.
- Continue to work collaboratively through international fora to address transboundary issues.
- Support implementation of initiatives to mitigate impact of terrestrial and extractive activities on coastal ecosystems.
- Enable the identification of new ocean conservation and protection areas required to support ocean health and sustainability.

Discussion questions:

- What are some effective ways to enhance environmental sustainability in the oceans?
- Are there opportunities for the Government to work with Indigenous communities and organizations, the private sector and not-for-profit organizations to support ocean health and climate change adaptation?
- What actions can be initiated to enhance coastal resilience and what roles could industry partners play in these efforts?
- What types of information and services are needed to support decision-making and adaptation?
- How could the United Nations' Decade of Ocean Science for Sustainable Development be used to inform the development of the blue economy strategy?



Innovation:

Reducing barriers to innovation and advancing business modernization

Ocean innovation is an important driver of economic growth and supports numerous well-paying jobs across Canada. Recent scientific discoveries and the development of advanced technologies are increasing efficiencies and productivity across ocean sectors. At the same time, innovations are changing the business models of ocean industries to foster sustainable use of resources.

Science and technology innovations play a key role in growing our blue economy. Well-aligned and strategic private and public investments in innovation can help Canada become a global leader in ocean research and technology development. Supporting a business environment that enables ocean start-ups to successfully develop, test, and commercialize their innovations can also advance our blue economy growth and sustainability objectives.

The Government has launched several programs to support ocean innovation in recent years. This includes Canada's fisheries funds, which help ocean companies modernize their operations to be more competitive and productive. We also support the work of the Ocean Supercluster and other ocean innovation hubs across Canada.

The Government will continue to seek ways to support ocean innovation; especially, tools and advancements that may be used across multiple ocean industries or may extend commercial potential and reach. This includes by strengthening the link between academia, industry players from start-ups to small- and medium-sized enterprises, and Indigenous partners with 'anchor' companies, so there is a better understanding of industry needs and technologies.



Challenges:

- Ocean innovation is comparatively more costly than in-land innovation and the associated risks and a general unfamiliarity associated with ocean innovation tends to hamper private sector investments.
- Canada boasts strong research and development institutional capacity, but technology developers are not always aligned with the needs of industry, which often creates commercialization challenges.
- The industry lacks access to talented and skilled workers to conduct research and development of advanced technologies.





a BLUE ECONOMY STRATEGY could ...

- Seek ways to better align federal programs supporting ocean innovation, including those for start-ups and small- and medium-sized enterprises.
- Explore how to de-risk early-stage “proof-of-concept” investments by ocean-technology users.
- Facilitate closer co-operation between technology suppliers (e.g. academia, research institutes) and technology users (e.g. ocean industry players, publicly funded ocean science activities) to develop advanced technologies and build the research talent pool.

Discussion questions:

- How can the commercialization of ocean innovation be better supported in Canada?
- How can stronger co-operation between anchor companies and ocean innovators be supported?
- What would help Indigenous communities and businesses increase their participation in ocean innovation?
- Where are Canada’s main strengths in ocean innovation and how can Government programming leverage these strengths to advance ocean sector growth and sustainability?
- How can new discoveries in ocean science and new achievements in technology development at Canadian post-secondary institutions be better publicized to encourage their commercialization?



Financing:

De-risking investments and improving access to private sector financing

Blue financing refers to private and public investments in projects that help restore and protect the ocean environment, while also supporting sustainable economic activities in the ocean. Its intent is to finance (or support by improving insurance availability) ocean-based projects that are grounded in sustainability and growth.

Blue financing can guide targeted government investments in ocean sectors. It can also provide certainty and clarity to the financial industry to increase the level of investments in blue economy opportunities.

Challenges:

- **Canada's financial sector is less familiar with the concept of blue financing and may be hesitant to invest in ocean-related innovative projects.**
- **A level of skepticism regarding actual environmental and sustainability benefits of ocean projects that would be supported by blue financing.**
- **Ocean projects are often fragmented and consequently fail to provide the scale that banks and investment firms seek.**
- **Conservation projects may not offer a steady stream of revenues or even a return-on-investment potential making it difficult to attract private sector investors.**



Blue financing investments could support a wide range of ocean projects and initiatives in Canada, such as sustainable aquaculture and regenerative ocean farming, marine biotechnology, alternative propulsion systems, eco-tourism, de-carbonization of marine shipping, ocean ecosystem restoration, and carbon sequestration (e.g. blue carbon). This would contribute to the development of our sustainable blue economy, and help us fulfill international commitments, such as to the United Nations “Life Below Water” Sustainable Development Goal.

De-risking investments and attracting additional private sector capital under a blue financing model may serve to advance ocean-related activities. However, adoption of a transparent regulatory and reporting framework for financial institutions and ocean-based businesses to guide and facilitate future private sector investments would first be required.





a BLUE ECONOMY STRATEGY could ...

- Identify actions needed to facilitate the development of an environment conducive to blue financing.
- Work with the financial sector to develop blue finance tools that could help de-risk private sector investments in innovative and conservation-related projects and ocean start-ups, including investments in Indigenous communities.
- Support the financial sector in developing and adopting blue financing principles and reporting requirements to increase transparency and grow private sector investments in sustainable ocean projects.
- Promote “ocean literacy” and awareness in the financial sector and among private investors.

Discussion questions:

- How can Canada’s recent work on green finance be leveraged to advance blue finance?
- How can Canada use its robust financial sector to support blue economy projects and the development and advancement of cutting-edge technologies?
- What activities could be taken in Canada to help de-risk private sector investments in innovative, sustainability, and conservation-related ocean projects, including in Indigenous communities?



Science and Data:

Advancing ocean observation and data collection and supporting world-leading scientific research

Data collected through sustained ocean observations, measurements, and forecasts enable the majority of our ocean economic activities to occur. Data and other collected information also help us understand the impacts of economic practices. Insights offered by data inform legislation to regulate ocean use and protect the ocean environment. It also leads to more efficient and safer ocean-based operations.

Canada has become a leader in ocean observation with extensive research strengths both in government and in university programs. For example, the Canadian Integrated Ocean Observing System, SmartAtlantic, Ocean Networks Canada, and the RADARSAT Constellation Mission collect, analyze, and manage ocean data to support evidence-based decision-making on ocean management, disaster mitigation, fisheries resources, and environmental protection. They also provide critical data to industry for safer and more efficient operations.

Additionally, the Natural Sciences and Engineering Research Council's Canadian Healthy Oceans Network is exploring the ecosystem characteristics that define the capacity of our oceans to recover or respond to management strategies, such as conservation networks, spatial closures, and restoration. This research also aims to understand and quantify how key stressors, including cumulative impacts in high-use environments, alter marine biodiversity and ecosystem functions.

There is still room for growth and development in ocean observation, data collection, and ocean modelling. With Canada's current expertise, for example, there is an opportunity to globally lead the development of new technologies, including space-based technologies, for advanced tracking and monitoring of ocean spaces. We could also provide clarity, certainty, and facilitate discussion around jurisdiction, administrative authority, and natural resources. This includes by mapping and interpreting to modern standards the more than 90 per cent of Canada's seabed and subsurface to fill the gaps in knowledge of resource potential and risks to development.



Challenges:

- Gaps still exist in our knowledge of Canada's changing oceans.
- New technologies for ocean observing require higher data flows which puts extra demand on computation infrastructure and inhibits delivery of data in near-real time.
- Data-driven decision-making depends on timely availability of data and information in the form of readily usable products and services.





a BLUE ECONOMY STRATEGY could ...

- Examine how to address gaps in foundational ocean information, research, and data, including ecosystem science, climate change science, traditional knowledge, geoscience, and ocean monitoring, data collection and archiving.
- Advance better coordination and integration of various data stream sources (e.g. satellites, airborne, and in-situ) to produce high-valued data products.
- Seek ways to advance the development of services and products for decision-making and make ocean data and information available to more Canadians.
- Support ocean industries, such as aquaculture and shipping, and unlock the potential of energy and mining sectors in the offshore through improved seabed mapping of Canada's oceans.
- Increase clarity and certainty around jurisdiction and natural resource ownership by establishing a marine ownership registry in the offshore.
- Enhance linkages between government, Indigenous groups, universities, and the private sector to align research priorities and improve data sharing amongst ocean partners and stakeholders in order to enable more efficient development of new technologies and solutions.

Discussion questions:

- How can the Government make ocean observation and mapping more accessible to Canadians? How could enhanced access to data support innovation, economic growth, and cutting-edge scientific research?
- What data and knowledge gaps need to be filled to support better ocean-related decision-making?
- What ocean observation services and products are required to support decision-making?
- How can Canada enhance its fractured data infrastructure to obtain and share data across all three oceans? How can we make this infrastructure more sustainable and accessible?
- How can the private sector, Indigenous groups, and not-for-profit organizations be more involved in advancing ocean observation and data collection?



Market Access:

Improving access to foreign markets and attracting new foreign direct investments

Trade and investment are key drivers of Canada's economy. Current and future growth and prosperity in the blue economy will depend on open world markets and stable, predictable, and transparent trading and investment environments.

The Government works multilaterally and bilaterally with numerous countries to promote and defend Canadian interests, including by promoting trade and ensuring market access for our goods and services. Provinces and territories also support businesses through their role in market and branding development and foreign direct investment attraction.

Canada uses a number of programs and tools to help businesses grow and export their goods and services, including foreign investor services. Recent initiatives and investments have built on the success of these programs and tools to facilitate a stronger rate of export growth and attract more foreign direct investments. This includes supports to help Canadian companies diversify their exports to take advantage of trade agreements, such as the Canada-European Union Comprehensive Economic and Trade Agreement.

A blue economy strategy would provide a backdrop on which the Government could work to boost ocean sector export growth and investment attraction, including investments in 'green' technologies and practices. Pre-pandemic, Canada's overall performance in attracting foreign direct investment was very strong and we have experienced lower declines of this investment at 32 per cent compared to global total of 49 per cent.

Containment measures to restrict the spread of COVID-19 have affected every aspect of international trade. At the end of September 2020, year-to-date imports and exports were lower by 13 and 14 per cent, respectively, compared to the same period in 2019.⁵ Escalated airfreight transportation rates and capacity shortages are encouraging some shippers to pursue sea freight or to split supply chain

shipments between ocean and air pallets.⁶ This situation also indicates that investments in marine transport may be essential to support strong trade routes.

As the economy recovers from COVID-19, it will be important for Canada to attract foreign direct investments, revitalize traditional markets, seek new markets, and expand domestic market presence.



Challenges:

- The threat of protectionism in some countries to favour domestic companies and hinder market access for foreign competition.
- The pandemic has exposed the vulnerability of certain global supply chains which could be realigned with a more regional focus.
- Global decline in foreign direct investment as companies try to support domestic operations.
- Domestic consumption of Canadian-sourced seafood is low compared to imported seafood products.
- Some ocean industry sectors, such as ocean technology, are facing challenges in reaching new customers and completing business transactions that require product demonstration due to current travel restrictions.
- COVID-19 has caused major market disruptions and economic recovery could take longer than anticipated, which would continue to affect our export industries.
- The need for industry to pivot to recover from impacts from COVID-19 while simultaneously adopting business practices that take sustainable development and conservation goals into account.

⁵ Statistics Canada. ⁶ More air cargo finds its sea legs during COVID-19. May 19, 2020.



a BLUE ECONOMY STRATEGY could ...

- Identify new markets with the greatest near-, medium- and long-term potential for growth.
- Engage industry in identifying opportunities for new or expanded programs to improve access to international markets.
- Explore the development of a Canadian sustainable blue economy brand to advance access to new markets and increase competitiveness of our ocean industries.
- Explore opportunities to increase domestic consumption of Canada-sourced seafood.
- In co-operation with provinces and territories, examine how to promote and improve the investment climate to increase private sector investments, including foreign direct investments, in our blue economy industries.
- Position Canada to take a global lead in the blue economy by strengthening ties with global partners and increasing ocean-related trade.

Discussion questions:

- What regulatory and/or legislative barriers dissuade private sector investments in or by Canada's ocean industries, including direct foreign investments?
- What might be needed to improve access to, and competitiveness within, new and existing markets?
- How can a better investment climate be created to attract new ocean-related companies to Canada and increase domestic private sector investments?



Business Environment:

Enhancing the long-term resilience and competitiveness of businesses

Business resilience and competitiveness are essential to enable a strong economy that creates good-paying jobs across the country. The Government can support our ocean companies by developing a business environment that fosters sustainable business operations, enhances business resilience, and drives competitiveness. We are already investing in key infrastructure, such as high-speed Internet in coastal and rural areas, and helping businesses modernize their operations by adopting advanced technologies.

The pandemic has tested the resilience of our ocean industries. Some companies have shown great adaptability in overcoming challenges, including by pivoting their operations to meet demand for new products and services.

Still, the pandemic has highlighted areas where Canada needs to enhance its resilience and competitiveness. This includes in areas such as infrastructure (e.g. ports and small craft harbours), and improved access to lending and equity capital.

The long-term resilience and competitiveness of our ocean companies will also be influenced by trends that affect the world-wide economy. A growing global population, potential disruption in global supply chains, innovation, climate change, and an emphasis on environmental sustainability are likely to have a profound impact on future business models and global markets.



Challenges:

- Supply chains and trade disruptions have disproportionate impacts on export-oriented sectors, especially sectors that produce perishable goods (e.g. fish and seafood).
- Ocean companies often lack access to lending and equity capital.
- Lagging technology adoption across ocean sectors may hinder productivity and competitiveness.
- Key infrastructure investments in coastal areas take a long time to develop and are costly.
- Communities and ocean businesses in coastal and remote areas often do not have access to high-speed Internet, which can hinder their resilience and prevent growth.





a BLUE ECONOMY STRATEGY could ...

- Explore how business risk could be reduced from the impacts of future unexpected events on the ocean sectors.
- Support ongoing Government initiatives to connect coastal and remote communities to high-speed Internet.
- Facilitate more operational stability and support for sectors with higher-cost and higher-risk projects (e.g. offshore oil and gas, renewable marine energy).
- Promote increased access by ocean start-ups and small enterprises to Government innovation programs.
- Seek ways to help ocean sectors modernize, strengthen, and diversify their supply chains and access new markets.
- Promote and support the adoption of advanced technologies that enhance long-term competitiveness.

Discussion questions:

- What assistance could help ocean sectors endure external shocks and recover more quickly from their impacts?
- What barriers are preventing the adoption of advanced technology? What would help the sector be better able to adopt this technology?
- What does resilience mean for your sector? What does competitiveness look like for your sector in the long-term? What is needed to help realize these goals?





Regulatory Environment:

Establishing robust and agile frameworks to support sustainable ocean economic growth

Canada's ocean companies need a competitive and predictable operating environment to be able to thrive, innovate, and grow. Regulatory systems must be agile, transparent, and responsive to the needs of business and the natural environment. Such frameworks must also be adaptable to technological developments.

Today's ocean industries are subject to ocean management planning and a number of industry-specific regulatory frameworks. These are intended to enable development, innovation, and long-term investor confidence, while ensuring environmental protection. For example, Canada modernized its *Fisheries Act* to provide fishers with more clarity about their operating environment while enhancing fish and fish habitat ecosystem protections. We are also engaging Canadians on the development of a new *Aquaculture Act* to provide industry greater operating clarity, enhance environmental protections, and help advance sustainable growth.

Strategic planning within our ocean spaces can work hand-in-hand with regulatory frameworks to bolster investments in Canada's ocean sectors. Marine spatial planning, for example, is an internationally recognized tool to support decision-making for sustainable use. Specifically, marine spatial planning brings together relevant decision-making authorities to collaboratively design an integrated plan that will guide the use and management of marine spaces in order to achieve a full range of ecological, economic, and social objectives.

Marine spatial plans are not intended to replace existing industry-specific regulatory frameworks. Rather, they identify areas for conservation and zones suitable for industrial activities, including at varying times. Marine spatial plans, and the governance mechanisms and data used to support their development, can also be used to inform and align decisions related to future major projects in these areas.

Canada's marine spatial planning efforts in the Pacific North Coast, Bay of Fundy–Scotian Shelf, Newfoundland–Labrador Shelves, and the Gulf of St. Lawrence are being designed with these goals in mind.

Challenges:

- Canada's vast ocean spaces create challenges for comprehensive planning and the integration of oceans-related scientific and socio-economic data and traditional knowledge.
- The results of integrated oceans management activities, such as marine spatial planning, can take time to yield demonstrable results and value.
- Regulations are designed to support existing technologies, but they must be sufficiently agile to be applied as innovative technologies evolve.





a BLUE ECONOMY STRATEGY could ...

- Examine ways to fill key gaps in ocean science, data, and traditional knowledge to assist marine spatial planning processes and a range of conservation activities.
- Explore opportunities for Indigenous and coastal communities to participate in planning, monitoring, and management work or other types of conservation work (i.e. restoration projects).
- Outline a suite of options (e.g. policy and/or legislative) to enhance integrated oceans management and/or marine spatial planning implementation in Canada so these processes more effectively support a full range of environmental, economic and social objectives.
- Examine the role of regulation as a driver of ocean innovation and identify main regulatory and administrative barriers to growth in areas such as ocean technology and ocean renewable energy.
- Facilitate the development of agile regulations that would address concerns of future- orientated ocean industries, offshore aquaculture, and marine biotechnology.

Discussion questions:

- How do regulation or other barriers impede business growth in Canada's ocean spaces?
- How can regulatory frameworks be aligned with integrated oceans management and/or marine spatial planning efforts? Are there best practices, both at home and abroad, that could be leveraged to guide Canada's approach?
- How can the precautionary principle guide the development of regulations for future-orientated ocean industries?

Advancing Sustainable and Prosperous Ocean Sectors in Canada

The ocean sectors operating in Canada today provide products and services ranging from food and transportation to energy and health. These sectors include:

- ocean-based energy
- marine transport, ports and shipbuilding
- aquaculture
- commercial fisheries and seafood processing
- coastal and marine tourism
- ocean technology
- future-oriented industries, such as marine biotechnology

Together, these sectors generate value important to local economies, coastal regions, and the Canadian economy more broadly.

The following sections describe how each of these sectors operates and how they benefit Canadians. Each section also suggests ways that a blue economy strategy could help enable, support, and advance sustainable growth. As in previous sections, we have posed a number of questions to get your ideas and feedback, which will help guide the development of this Strategy.





Ocean-based Energy

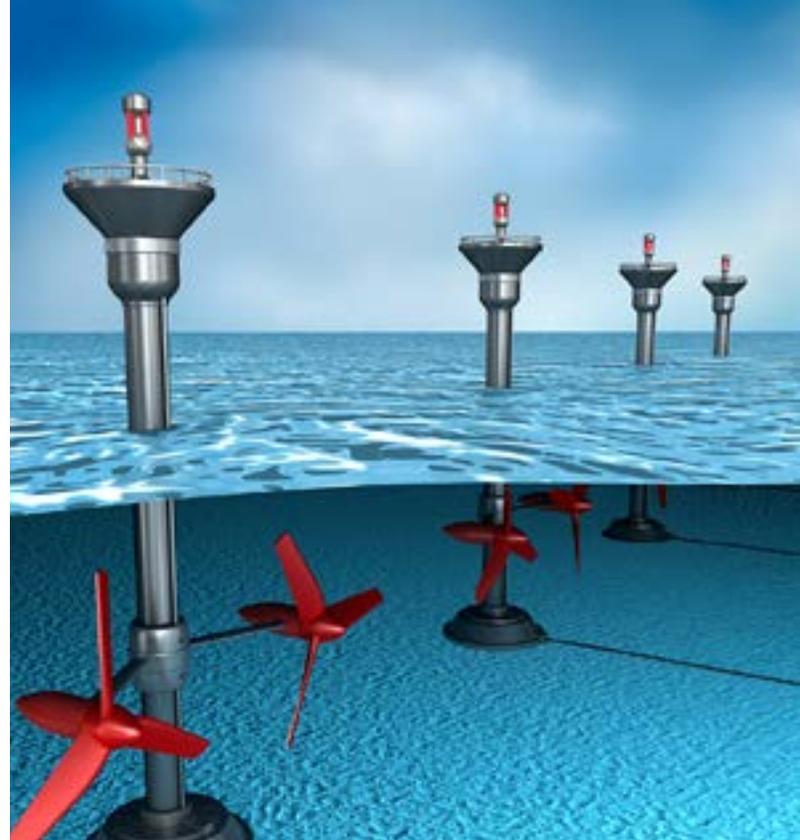
Canada's extensive coastal waters and ocean spaces offer great opportunities for the development of ocean-based energy. From offshore oil and gas and offshore wind to tidal and hydro energy and the use of clean hydrogen, there is significant potential in our oceans to harness energy to heat homes, drive vehicles, and run businesses. However, future development of ocean-based energy projects must consider the impact that they may have on marine species and habitats, the rights of Indigenous peoples, and the surrounding environment to avoid undermining other economic and environmental objectives and reconciliation.

Canada has benefitted from the growth in the offshore oil and gas sector in recent decades. This sector has fewer greenhouse gas emissions than the world average and can play an important role in Canada's transition to greener energy. Offshore oil and gas projects under the Canada–Newfoundland and Labrador Atlantic Accord have been the main driver of this sector. In 2016, the industry contributed approximately \$4.9 billion in GDP and just over 15,000 well-paying jobs when spin-off effects are taken into account. Recently modernized federal regulations will allow more efficient approval of exploratory offshore drilling in the province, providing further support to the sector.

Offshore oil and gas companies invest heavily in innovation that may benefit other ocean sectors, such as greater safety in marine environments. As part of the transition to renewable energy sources, these innovations may also enable the sustainable growth of other ocean sectors, such as offshore wind energy and aquaculture.

The Government also helps other ocean-based energy industries succeed. For example, it recently announced funding to support four Nova Scotia tidal projects that will bring clean energy technologies to the Atlantic region and help Canada build a cleaner future.

Taking full advantage of oceans-based energy opportunities will require collaboration from all levels of government, as well as significant private sector investments, to encourage investor funding, demonstrate projects, and enable commercialization. By working together, Canada will be well-positioned to advance cutting-edge technology to enable a resilient ocean-based energy sector in a manner that will help us advance to a carbon-neutral economy by 2050.



A photograph of an offshore oil rig in the ocean, with a large white iceberg in the foreground. The rig is red and white, with a tall tower. The sky is blue and the water is dark blue.

a BLUE ECONOMY STRATEGY could ...

- Facilitate the development of a regulatory framework to provide clarity concerning offshore renewable energy projects, including efforts to improve federal/provincial/territorial/Indigenous collaboration to streamline these projects.
- Support the adoption of digital and clean technologies in offshore oil and gas operations to reduce the carbon footprint.
- Identify mechanisms to de-risk private sector investments in new technology development and testing.
- Seek ways to clarify federal/provincial/territorial/Indigenous jurisdiction and responsibilities in areas without resource development agreements and joint assessment/planning boards, if needed.
- Advance an integrated approach to economic development and ocean conservation and protection in relation to the development and approval of new projects.
- Assess the extent to which mechanisms in Canada's current regulatory framework foster integrated approaches to support an attractive investment climate and make recommendations, if needed.

Discussion questions:

- What types of renewable energy could be further developed in Canada's oceans?
- How can ocean-based energy projects be best supported, including to ensure that they are safely and sustainably developed?
- What do Indigenous communities and businesses need to participate in these opportunities?
- How has COVID-19 impacted Canada's ocean-based energy sectors? What might be needed in the medium- and long-term to ensure economic recovery and growth?
- How can organizations, such as the Ocean Supercluster, spur innovation to advance sustainable ocean-based energy?
- Do you anticipate future challenges (e.g. regulatory, legal, public acceptance) for ocean-based energy that may need to be addressed by the blue economy strategy?



Marine Transport, Ports, and Shipbuilding

Marine transport, ports, and shipbuilding are sectors of significant importance to Canada's status as a trading nation and its economic potential. While continued growth of the world's population will increase demand for the services provided by these sectors, the rate of growth will be largely determined by how the global economic recovery shapes trade and global shipping routes.

To seize long-term growth opportunities within this reality, industries understand the importance of thinking and acting strategically. They know that adopting automation and digitalization is central to remaining globally competitive and resilient, while also helping them reduce the carbon emissions of their business operations.

Marine transport is a significant driver of Canada's blue economy, carrying \$246.5 billion worth of international trade in 2019, which represents 20.6 per cent of Canada's total international trade. Marine transport could also start playing an increasingly important role in the Arctic Ocean. This would require robust environmental oversight and more capacity within governments, industries, and Indigenous and coastal communities to ensure that fragile ecosystems remain protected.

The Government has been increasing its capacity in the Arctic region in recent years. Through the Oceans Protection Plan, for example, the Canadian Coast Guard extended its icebreaking season in the Arctic to ensure safe marine shipping and promote economic growth. The Canadian Coast Guard is also an active participant in the Arctic Coast Guard Forum, which is intended to foster safe, secure, and environmentally responsible maritime activity in the Arctic.

The marine transport sector generated 25,431 jobs in 2019, many of which are located in coastal regions and port communities across Canada. This number could grow as new shipping lanes are established and Arctic waters become more navigable. The growth of export-oriented sectors and land-based natural resources, such as forestry and petroleum production, may also increase traffic in the region.

At the same time, modern surveys, improved navigational services along key shipping routes, and new scientific discoveries and technologies could reduce the sector's greenhouse gas emissions and its overall impact on ocean ecosystems.





a BLUE ECONOMY STRATEGY could ...

- Explore and drive the research, development, and adoption of innovative technologies, such as artificial intelligence, quiet vessel technology, cybersecurity, and automation, as well as ‘smart’ technologies, such as autonomous underwater vehicles and maritime autonomous surface ships.
- Support digitalization of Canada’s waterways to enable optimization of marine shipping from port to port while enhancing marine safety.
- Promote the development and adoption of technologies that continue to reduce the sector’s carbon footprint, such as alternative propulsion systems and alternative fuels.
- Facilitate an integrated approach to economic development and growth with the development of improved technologies to help further protect marine mammals and reduce ocean noise.
- Support the objectives of the renewal of a modernized agreement between the Government and the St. Lawrence Seaway Management Corporation to manage the seaway.

Ports and harbours are essential enablers of marine transport and regional development, which allows Canadian businesses to fully participate in a globally integrated economy. Ports and harbours also play an integral role in supporting local and regional economic development and, increasingly, the testing and piloting of new ocean technologies and collecting data.

Ports, harbours, and associated construction activities provide a significant number of jobs in coastal communities. In 2016, there were more than 5,000 construction jobs at Canada’s ports and harbours.

In addition to ports in major coastal and inland cities, Canada has many smaller harbours, including over a thousand small craft harbours. Both community-managed harbours and those operated by Fisheries and Oceans Canada provide a hub for the economic activities in many remote and isolated Indigenous and non-Indigenous coastal communities.



a BLUE ECONOMY STRATEGY could ...

- Support ongoing work related to “green” infrastructure projects and the greening of business operations to accommodate growing traffic and enable sustainable operations at major ports (e.g. shore-based power) across Canada.
- Encourage continued adoption of automation and innovative technologies and services that lead to “smart” and competitive ports, such as artificial intelligence, Internet of Things, big data, and blockchain.
- Support the initiatives being undertaken as part of the Ports Modernization Review.
- In collaboration with territories and Northern and Inuit communities, explore marine infrastructure needs in the North and the Arctic that could support sustainable economic development.
- Examine ways to use marine infrastructure to better accommodate the diverse needs of a growing blue economy (e.g. aquaculture, fishing gear disposal).

Shipbuilding in Canada not only consists of building and maintaining vessels to meet our unique domestic needs, it provides important support to other ocean industries and our network of coastal and Indigenous communities across the country.

Canada has a number of shipbuilding policies and support measures to ensure safety, sovereignty, and economic sustainability. Our longstanding “Buy in Canada” policy, for example, requires the federal government to procure, repair, and refit vessels in Canada. We also exclude shipbuilding and repair from our free trade agreements to support and protect this important ocean sector.

In 2010, Canada launched the National Shipbuilding Strategy to renew our federal fleets and establish a sustainable industrial base on which to revitalize the sector. Through this initiative, partner shipyards are

contractually required to make value proposition investments to benefit ocean industries in the areas of human resources development, industrial development, and technology. These investments are entirely directed by the shipyards at no cost to Canada and they amount to 0.5 per cent of the value of their large vessel contracts. Moreover, through the application of the Industrial and Technological Benefits Policy, contractors continue to build Canada’s capacity in the marine industry in the areas of supplier development, innovation, human resources development, and exports.

Since the National Shipbuilding Strategy was introduced, it is estimated that shipbuilding contracts issued have contributed over \$17.04 billion (\$1.55 billion annually) to our GDP and annually supported more than 15,500 jobs. And, as the strategy matures, its economic benefits to Canada will continue to grow.



a BLUE ECONOMY STRATEGY could ...

- Help industry seize new opportunities for growth both in Canada and abroad, including development and adoption of digital technologies, such as automation, specialized marine electronics for harsh environments, digital twins, and remote operations, and the adoption of green technologies in the design and building of ships.
- Continue to support shipyards so they can meet current and anticipated demands for new Canadian Coast Guard and Royal Canadian Navy fleets.
- Explore how to help Canada's marine transport sector increase its participation in global shipbuilding activities, including by advancing solutions to key challenges, such as ice breaking and navigation, that could be commercialized and exported.

Discussion questions:

- How has COVID-19 impacted Canada's marine transport, ports, and shipbuilding sectors? What might be needed in the medium- and long-term to ensure economic recovery and growth?
- How can Canadian ocean-based businesses better leverage existing Government programs to further develop domestic capacity in shipbuilding and the marine transport sector overall?
- What can be done to modernize and improve efficiency and environmental sustainability in marine transport, ports, and shipbuilding sectors?
- Are there other challenges and opportunities for sustainable economic development in these three sectors? If so, how can they be addressed?
- How can Indigenous communities and businesses benefit from procurement, employment, and training opportunities related to these sectors?



Aquaculture

Aquaculture has been identified within Canada and internationally as a key agri-food sector that supports the world's growing demand for animal protein. The sector contributes to food security and human health and it does so in a low-carbon production manner.

Aquaculture in Canada occurs in all provinces and territories, employing thousands of Canadians in coastal and Indigenous communities. In 2019, the sector generated 4,100 direct jobs and produced over 190,000 tonnes of product, which directly contributed over \$300 million to our GDP. The industry has significant year-round employment growth potential in Canada, making it particularly well suited to revitalizing remote, rural and coastal communities, including Indigenous communities. The interest of Indigenous peoples in commercial aquaculture production also continues to grow from coast to coast to coast.

On August 17, 2020, the Government started engaging Canadians in a proposed federal Aquaculture Act to provide greater regulatory clarity for the industry and to foster national consistency, while respecting existing jurisdictions and regional differences. The Government has also been working with the Province of British Columbia and Indigenous communities in this region to create a responsible plan to transition open net-pen farming in coastal waters. This plan is being informed by consultations and engagements with provincial, territorial, and Indigenous partners, along with stakeholders, to ensure that it is environmentally responsible, economically feasible, and accounts for social considerations.

The United Nations Food and Agriculture Organisation has highlighted the need for aquaculture to address the increased global demand for seafood. This will drive future sector growth, providing Canada with a unique opportunity to promote its resources, skills, and knowledge, and to be positioned as a global leader in sustainable, high-quality aquaculture production.

In Atlantic Canada, salmon aquaculture activities are expected to continue to expand over the next several years. The region's globally recognized shellfish industry also remains strong with growth opportunities for the development of the local value chain.



Technology in aquaculture, such as automation, digitalization, and traceability, continues to evolve and is a key driver of sustainable development in the sector. There are also supply chain opportunities in upstream industries, such as boat and cage construction, transportation, genetics and pharmaceuticals, sensors, and unmanned operations.

Future growth and innovation in aquaculture will be shaped by new technologies, diversification of species, and enhanced environmental protections. This includes protections developed as a result of engagements with provinces and territories, Indigenous groups and other partners, as well as stakeholders. The sector will also need to work in collaboration with regulators and partners to address specific challenges, including cumbersome regulatory processes and uncoordinated federal and provincial requirements, the lack of specialized and highly skilled workers, and the need to build public trust and understanding of the industry.



a BLUE ECONOMY STRATEGY could ...

- Facilitate co-operation among provinces and territories, Indigenous groups, and stakeholders to promote innovation and adaptation to emerging technologies, enhance infrastructure, support environmental stewardship and conservation objectives, and identify barriers to sector growth.
- Support the introduction and implementation of a new federal Aquaculture Act.
- Support the development of a responsible plan for aquaculture in British Columbia.
- Help identify new domestic and overseas market opportunities for the sector.
- Promote the engagement of federal regulators, provinces and territories, Indigenous groups, and stakeholders to advance an offshore aquaculture regulatory framework in Canada.
- Make use of marine spatial planning and area-based management to identify environmentally and socially appropriate locations for the siting of aquaculture operations.
- Explore opportunities to work with Indigenous groups to advance reconciliation efforts and identify economic development opportunities related to aquaculture.
- Support economic recovery and growth in a post-COVID-19 economy and further enhance Canada's food security.

Discussion questions:

- What types of investments or actions could be made to advance and support innovation and sustainable growth in the sector?
- How can aquaculture projects be best supported, including to ensure that they continue to be sustainably developed?
- How can organizations, such as the Ocean Supercluster, spur innovation to advance sustainable aquaculture?
- What types of actions are needed to foster more diverse economic participation in this sector, including the participation of Indigenous peoples?
- How has COVID-19 impacted Canada's aquaculture sector? What might be needed in the medium- and long-term to ensure economic recovery and growth?



Commercial Fisheries

Commercial fishing is incredibly important to the local economies of Canada's coastal regions and the well-being of Indigenous and non-Indigenous communities. Whether it be large- or small-scale operations, commercial fishing is often the single largest source of local jobs in these regions.

In 2016, the commercial fishing sector generated approximately \$3 billion in GDP and provided over 26,000 jobs across Canada when its spin-off effects are taken into account. The total landed value of the wild capture fishery also increased by 123 per cent between 2009 and 2017. This growth has been driven by consumer demand for high-value species in both Atlantic and Pacific fisheries (e.g. lobster, crab, other shellfish, and groundfish) and higher market prices.

Canada's commercial fisheries sector is highly export-oriented, producing our largest single food commodity export by value and equivalent to about 80 per cent of domestic production volume. Commercial fisheries and aquaculture operations also support fish and seafood processing, a key part of the value chain and another significant employer in Indigenous and other coastal communities. An estimated 20,400 individuals are directly employed in fish and seafood processing, with an additional 32,167 indirect and induced jobs stemming from the industry.

The long-term sustainability and success of the commercial fishing sector is directly linked to the health of fish stocks. Growing pressure on fish stocks and environmental impacts, such as climate change, pose current and future challenges for fisheries management. Moving forward, helping Indigenous and non-Indigenous fishers to continue adopting sustainable practices and adapting to changes in fish stock health will be an important role for governments. Investing in science will also strengthen our ability to conserve, protect, and eventually rebuild fish stocks and ecosystems to ensure continued economic development and sustainability.

The development of innovative approaches and technologies to help reduce the impacts of commercial fishing on the environment and fish stock health is another way to ensure continued sustainability and increased operational efficiencies. For example, ocean innovation sectors could work with commercial fishers to develop and adopt new sustainable gear technologies (e.g. rope-less traps) to help prevent gear loss, address ghost gear, and reduce marine mammal interactions. Developing domestic seafood traceability capacity for Canadian fish and seafood products would not only increase the value and marketability of our sustainable commercial fishery and aquaculture operations, it would also help our domestic industry meet international market access requirements.

The COVID-19 pandemic disrupted fish and seafood markets both in Canada and globally. Reduced demand, low market prices, port closures, inability to access cold storage facilities, and severely limited shipping and air freight services significantly reduced the capacity at which our industry operated for the first part of the fishing season. While production has subsequently resumed to near-normal levels, prices remain soft, and early volume losses have not been recouped. Government support has been essential to help the sector start to recover and the right mix of federal programming must be in place to support long-term resiliency and sustainability.





a BLUE ECONOMY STRATEGY could ...

- Explore opportunities to generate increased value of wild capture fisheries through improved environmental performance and by promoting a sustainable, high-quality, safe, and equitable industry that appeals to consumers in Canada and foreign markets.
- Continue to advance, and co-develop with Indigenous communities, strong resource management, governance, enforcement, and regulatory frameworks focused on preserving the health of fish stocks and marine ecosystems.
- Advance co-operation with Indigenous communities, industry, and fishers on identifying new and innovative ways of fishing to reduce by-catch and impacts to marine mammals and to foster sustainable operations.
- Further strengthen existing co-operation between fishers, Indigenous organizations, academia, and the Government in identifying, and helping to adapt to, climate change effects on the health of fish stocks and species availability.
- Support new innovations, technologies, improved science, Indigenous and community knowledge, and data collection that can help reduce the impacts of fishing on the environment and increase efficiencies in commercial operations.
- Examine opportunities to work with Indigenous communities and organizations, industry, and fishers to support the development of a sustainable seafood traceability system and pathways to obtain eco-certifications.
- Support the development and adoption of sustainable technologies in fish harvesting and seafood processing operations, including technologies to minimize the loss of fishing gear and to retrieve ghost gear.
- Facilitate domestic adoption and export of “made-in-Canada, next-generation” fishing gear and technologies related to marine remote sensing, traceability, observation and monitoring in order to combat Illegal, Unreported, and Unregulated fishing and support sustainable fisheries.

Discussion questions:

- How can Canada’s approach to fisheries management continue to improve while enabling fishers to derive top value from their harvests?
- Given the economic, social, and cultural importance of fisheries to Canada’s coastal regions, what actions would best position the industry to remain viable and sustainable over the long-term?
- How can fishers be supported to transition to carbon-neutral business operations?
- What do Indigenous communities and businesses need to increase their participation in this sector?
- What can fishers do, or need, to better manage climate change impacts on fish stock health and species availability?
- How can the sector or Government best support innovation to reduce by-catch, lessen impacts to marine mammals, and achieve other environmental objectives, while increasing the efficiency of commercial fisheries?
- How can the sector or Government address the changing nature of the workforce, including an aging demographic, and best support the next generation of fishers?
- What else might be needed in the medium- and long-term to ensure economic recovery from COVID-19 and growth?



Coastal and Marine Tourism

Oceans feature prominently in Canada's tourism sector. The cruise industry, boating tours, recreational fishing, and diving all take place in ocean spaces. On-shore tourism in small coastal communities, and at historical sites and other notable cultural destinations, also depend on the ocean to prosper. Moreover, the ocean is an important element of local tourism brands across the east and west coasts, and the Indigenous tourism industry across Canada.

Coastal and marine tourism offers a variety of employment opportunities for Indigenous and non-Indigenous communities and is an important contributor to economic growth. In 2016, marine tourism directly employed 32,700 Canadians and created \$1.7 billion in value-added for our economy. Its full impact is much larger, however, as it supports an additional 19,800 jobs and \$2.0 billion in value-added when spin-off effects are taken into account. Recreational fishing in particular is a popular leisure activity for Canadians and thousands of visitors each year. This activity benefits many local economies; especially, in remote areas.

The global pandemic has had a profound effect on the tourism sector with border closures, travel restrictions, and certain health and safety measures. A full recovery within the tourism sector is also expected to take longer to achieve than in other ocean sectors. The Government recently increased its Regional Relief and Recovery Fund to \$2 billion, of which 25 per cent is earmarked for tourism. Continued Government support of ocean and marine-related tourism will help this sector stabilize, recover, and drive future economic growth and the creation of good jobs for Canadians.

Future growth within the coastal and marine tourism sector will also depend on Canada's ability to protect and enrich its vast marine biodiversity, oceans, and coastal environments. This is especially important in the Arctic because this region lacks adequate infrastructure to support tourism growth and the associated safety and security challenges, such as search and rescue operations and responses to human-caused disasters. New ideas and opportunities for coastal and marine conservation, Indigenous-led initiatives, and coastal community capacity building could advance this sector in a more inclusive and enduring way over the longer term.





a BLUE ECONOMY STRATEGY could ...

- Explore and identify new sustainable tourism opportunities that align with economic development and marine conservation objectives, as well as the protection of marine mammals.
- Seek ways to enable marine infrastructure to better support marine and coastal tourism.
- Explore opportunities with coastal Indigenous communities to identify and capitalize on sustainable marine tourism opportunities aligned with their values and priorities.
- Continue to support recovery efforts for Canadian coastal and marine tourism businesses affected by the pandemic so that they can build back better.

Discussion questions:

- As Canada's economy begins to recover from the impacts of COVID-19, what challenges and opportunities for marine and coastal tourism should be prioritized?
- What is needed to help advance and support sustainable coastal and marine tourism in Canada? How can we better align current federal tourism development and marketing to support ecologically sensitive coastal and marine tourism?
- What further actions can be taken to safeguard marine mammal life, while developing the marine tourism sector?
- How will climate change impact the operations of tourism sector businesses over the short and long terms?
- What specific actions are required to foster more diverse economic participation in this sector?
- What do Indigenous communities and businesses need to increase their participation in this sector?
- How do the needs of tourism operators in Canada's various coastal areas differ?
- What else might be needed in the medium- and long-term to ensure economic recovery and growth?



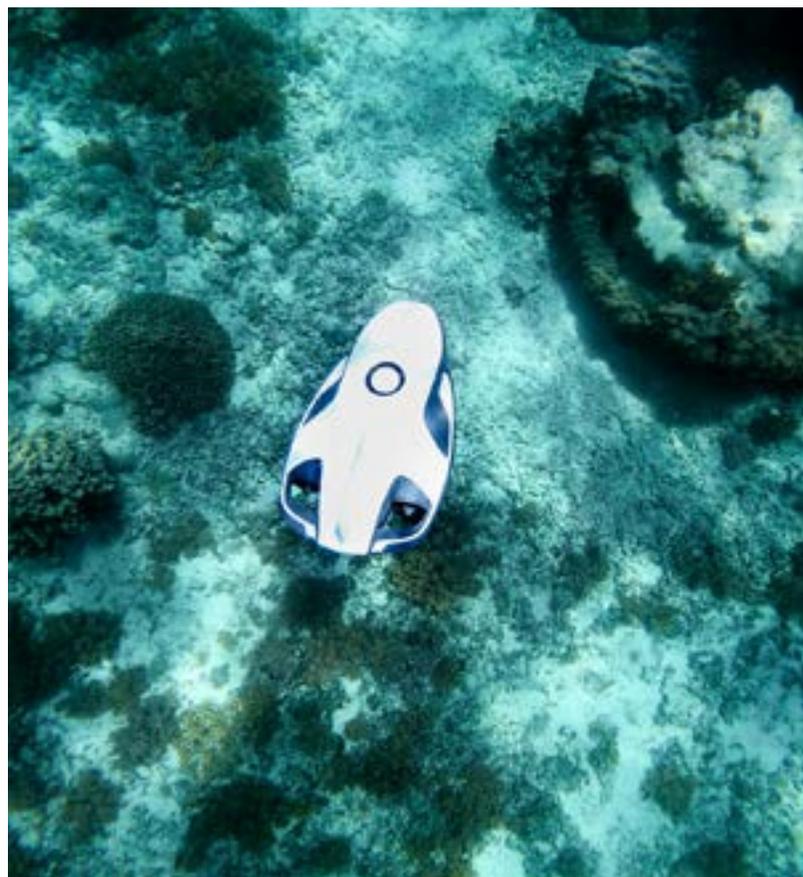
Ocean Technology

The ocean technology sector in Canada consists mainly of small companies which offer specialized products or services based on a core technology. While these companies are found across the country, there are important clusters around the ocean science and research organizations in Vancouver, Victoria, Rimouski, Halifax, Fredericton, and St. John's. This enables industry-research collaborations to develop cutting-edge solutions to the most challenging issues facing our oceans, while building the education and credentials of future employees.

The ocean technology sector is a key enabler of global blue economy growth. Prior to COVID-19, this was emphasized in "The Ocean Economy to 2030" report by the Organisation for Economic Cooperation and Development. As ocean industries recover from the pandemic, Canada could be well-positioned to seize opportunities to grow this sector.

Ocean technology companies in Canada are world-leading innovators in sensor technology, remote sensing (radar and acoustic), subsea vehicles/robotics, autonomous systems, harsh ocean environment technology, and marine simulation. To foster continued development of new technologies, the Government supports the industry-led Ocean Supercluster, which brings together diverse ocean industries to drive innovation as a means to generating growth.

While Canada is a leader in some ocean technology areas, the sector could still benefit from Government support to recover from COVID-19 impacts, improve overall global competitiveness, and ensure longer-term growth.





a BLUE ECONOMY STRATEGY could ...

- Identify and address barriers to existing efforts around start-up growth and scale-up.
- Explore opportunities to work with provinces and territories, Indigenous groups, academia, business, and other organizations to enhance the ocean innovation network by supporting technology commercialization through, among other things, project demonstration and flexible procurement.
- Provide a framework for coordinated government actions to help small- and medium-sized enterprises diversify, take advantage of Canada's free trade agreements, and access new and fast-growing markets, such as in Asia.

Discussion questions:

- What are the key short- and long-term challenges and opportunities for our ocean technology sector?
- How can commercialization of ocean-related science and research be better supported?
- Can technology transfer and innovation between ocean sectors be better supported to expand commercial opportunities for our ocean technology developers and innovators?
- What do Indigenous communities and businesses need to increase their participation in this sector?
- What might be needed in the medium- and long-term to support economic recovery and growth?
- How can the Government support and enable a domestic market for ocean technology products and services that companies can leverage in the global marketplace?
- How can ocean technology companies be more included in conservation and protection initiatives through the development of new solutions?



Future-oriented Ocean Industries

There are a number of future-oriented ocean industries with significant economic potential, such as marine biotechnology, offshore aquaculture, and seabed mining. The development of these industries is often based on, and enabled by, cutting-edge science and new technologies.

A blue economy strategy could help Canada capitalize on the economic opportunities presented by future-oriented ocean industries, while integrating measures to maintain ocean health and protect ocean ecosystems. We are especially well-positioned to seize the economic growth opportunities presented by marine biotechnology due to our existing expertise and abundant marine resources.

While there is no standard definition, in general, **marine biotechnology** produces knowledge, goods, and services from the genetic resources found in marine organisms that may be applied in other industries. Three examples include:

- Health and Pharmacology: marine compounds with anti-viral properties are undergoing pre-clinical and clinical trials around the world.
- Bioremediation: using marine compounds to clean up pollution and support environmental remediation.
- Biofuel: algae is being explored as a viable biofuel.

Marine biotechnology is a growing sector in Quebec, British Columbia, and Prince Edward Island. More than 20 companies in Quebec currently receive support from the Marine Biotechnology Research Centre, which was created by the *Association du cancer de l'Est du Québec* and the *Université du Québec à Rimouski* in 2004. Genome British Columbia joined an international collaboration to develop genomic resources for salmonids that are now being used to examine responses to environmental factors, pathogens, and pollutants.

In the future, Canada could use marine biotechnology to improve the quality of our fish and seafood exports, develop valuable pharmaceutical products, and further bioremediation efforts. However, we must first address the challenges of this relatively new sector. This includes establishing a common definition of the sector and regulatory structures to support it, de-risking the development of new groundbreaking technologies, and helping industries gain access to financing.





a **BLUE ECONOMY** **STRATEGY** could ...

- Explore how existing innovation funding opportunities could facilitate the growth of emerging ocean industries.
- Explore with private sector which areas within emerging ocean industries have the greatest near-, medium-, and long-term potential for growth and what is needed to support this potential.
- Support streamlining and modernizing relevant regulatory regimes to reduce administrative burden, stimulate innovation, and provide clarity and certainty to emerging ocean industries (i.e. experimenting with pilot projects, testing groundbreaking technologies).
- Work with industry to identify policy instruments that would encourage traditional ocean industries to invest in and develop emerging ocean industries.

Discussion questions:

- How do current regulatory structures hinder the growth of ‘future-oriented’ ocean sectors?
- What tools can be put in place to ensure this sector can leverage opportunities for growth domestically and abroad?
- Are there particular skills and labour challenges facing emerging ocean sectors?
- What do Indigenous communities and businesses need to increase their participation in this sector?
- What types of support could help to ensure the sustainable growth of these sectors, such as the transfer of applicable skills and technology from current to future ocean industries?



The Big Questions and Ways to Share Your Ideas

Thank you for taking the time to read this discussion paper and share your ideas. Your insights will inform the development of Canada's Blue Economy Strategy.

There are a few overarching questions that we invite you to also consider in your submission:



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Fisheries and Oceans Canada invites all Canadians to comment on the Blue Economy Strategy as described in this publication.

Submissions may be sent to:
BlueEconomy-EconomieBleue@dfo-mpo.gc.ca
or refer to the mailing address in the
How to Reach Us section.

Do not provide any personal information or history.

Information received throughout this consultation process is subject to the *Access to Information Act* and the *Privacy Act*. Should you express an intention that your submission, or any portions thereof, be considered confidential, we will make all reasonable efforts to protect this information.

The handling of any personal information collected in this submission process is described in the standard personal information bank [Outreach Activities PSU 938](#).

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