2022

Engaging on Canada's

Blue Economy Strategy

What We Heard

Blue Economy Strategy

Your oceans • Your voice • Your future

Canada

Note that some quotes have been translated from French.

Published by:
Fisheries and Oceans Canada, Ottawa, Ontario K1A 0E6

Cat. No. Fs23-641/2022E-PDF ISBN 978-0-660-39807-5

Correct citation for this publication:
Engaging on Canada's Blue Economy Strategy: What We Heard. March 2022. 58 p.

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Minister's Message

Canada's blue economy should be second to none. We are a nation of three oceans and nearly 250,000 kilometres of sprawling coastline—more than any country in the world. Almost one in five Canadians live in our coastal communities—communities that are driven by ocean industries and Canadians who make a living on the water. We are also home to the St. Lawrence Seaway, Hudson Bay, the Great Lakes and other iconic waterways that account for one-fifth of the world's freshwater.

Our blue economy has so much potential. Combined, Canada's ocean industries generate over $30 billion a year, yet that is one per cent of our national GDP. With a Blue Economy Strategy, we can do better. It will be a plan to make the ocean values that drive our coastal economies more sustainable and more productive, so coastal communities can be more prosperous.

Canada's last ocean strategy was released in 2002. Since then, we have made huge strides in ocean health, protection, and innovation. We need to apply those to our ocean economy. Just as Canada needs a climate plan to get to net-zero, we need a new Blue Economy Strategy to guide new federal ocean investments. If we focus our actions—on all three coasts, across all ocean sectors, in each of our vastly different ecosystems—toward the goal of regenerating our marine life and restoring its biodiversity, we can responsibly harness the economic opportunities that a healthy ocean provides, to build a more sustainable living on our oceans.

There's never been a better time for Canada to reimagine its blue future, because a healthy ocean has more to give. A healthy ocean can absorb more greenhouse gases. A healthy ocean is home to more abundant fish and marine life. A healthy ocean is one that industry, workers and our communities can rely on, and visitors can enjoy. The economy we want is a reliable blue economy. And that's what this strategy will create for Canadians.

Last year we asked Canadians from coast-to-coast-to-coast how to best shape a Blue Economy Strategy. We heard from people who are closest to the oceans—from Indigenous peoples, fish harvesters, scientists, and so many, many, more. Clearly, Canadians were eager to share their ideas, concerns, and solutions to grow a stronger, more sustainable blue economy. This wealth of information will help inform me and will, I believe, guide a strategic, measured and coordinated approach to responsibly invest in our communities and oceans.

I invite Canadians to read this *What We Heard* report, and I thank all those who contributed to it. You have laid the foundations of a strategy that will build a better—and bluer—tomorrow for our oceans and for our country.

Warm regards,

The Honourable Joyce Murray, P.C., M.P
Minister of Fisheries, Oceans and the Canadian Coast Guard

Engagement Overview

In December 2019, the Minister of Fisheries, Oceans and the Canadian Coast Guard was mandated to lead the development of a comprehensive blue economy strategy to enable Canada to grow its ocean economy in order to create jobs and opportunity for coastal communities, while advancing our conservation objectives. The September 2020 Speech from the Throne reiterated the importance of this initiative and its connection to reconciliation with Indigenous peoples.

To achieve this mandate, it was very important to hear directly from Canadians on how this strategy could best support and advance the economic well-being of coastal and Indigenous communities and the sustainable growth of our ocean sectors, while protecting and enriching our ocean ecosystems. Fisheries and Oceans Canada (DFO) developed an engagement paper to guide how this input would be received, which was published on February 8, 2021.

Over a span of 158 days, we talked with provincial, territorial and Indigenous partners and a wide range of Canadians involved in ocean industries, environmental and social justice initiatives, academia, science, and research & development. We also encouraged all Canadians to share their feedback by answering online survey questions or by sending us written input.

Our engagement activities included a series of virtual roundtables and meetings led by the Minister of Fisheries, Oceans and the Canadian Coast Guard in partnership with many other Ministers, Parliamentary Secretaries, and senior departmental officials. Engagement was a whole of government approach, including both national and regional meetings to ensure government heard from various partners and stakeholders. Federal departments and agencies included, but are not limited to: Innovation, Science and Economic Development Canada, Transport Canada, Natural Resources Canada, Crown–Indigenous Relations and Northern Affairs Canada, Women and Gender Equality and Rural Economic Development, Small Business, Export Promotion and International Trade, and the Regional Development Agencies. In addition, several organizations also held their own blue economy engagement sessions, including Memorial University in Newfoundland and Labrador, Ecology Action Centre and SeaChoice, *Students on Ice*, and the Vancouver Island Economic Alliance.

All of the engagement sessions presented opportunities for participants to discuss specific topics, industries and regional interests, while hearing from different levels of government and from representatives of different communities, industries and groups. The wide range of participants meant that everyone could benefit from hearing diverse, and sometimes differing, points of view.

The response to the blue economy engagement activities was incredible. Clearly, Canadians are interested in the development of a sustainable and inclusive blue economy as part of our future. We are pleased to share an overview of the input we received through this *What We Heard* report.

Ministers and government officials alike heard diverse perspectives, suggestions and challenges from Canadians who participated in virtual roundtables and online. A number of quotes highlighted throughout this document capture some of the points raised during the engagement phase.

The report has been organized to follow (where possible) the structure of the blue economy strategy engagement paper, while expanding on key themes and areas of consensus:

- **Opportunities & Barriers** to position our blue economy for growth and success
- **Inclusion & Diversity** to ensure growth and prosperity for all
- **Sustainable & Prosperous** blue economy sectors today and in the future

This feedback will guide the development of our blue economy strategy and will inform our blue economy-related activities and investments for years to come. It will also inform how we work with our provincial, territorial and Indigenous partners to achieve objectives that involve or are led by other jurisdictions.

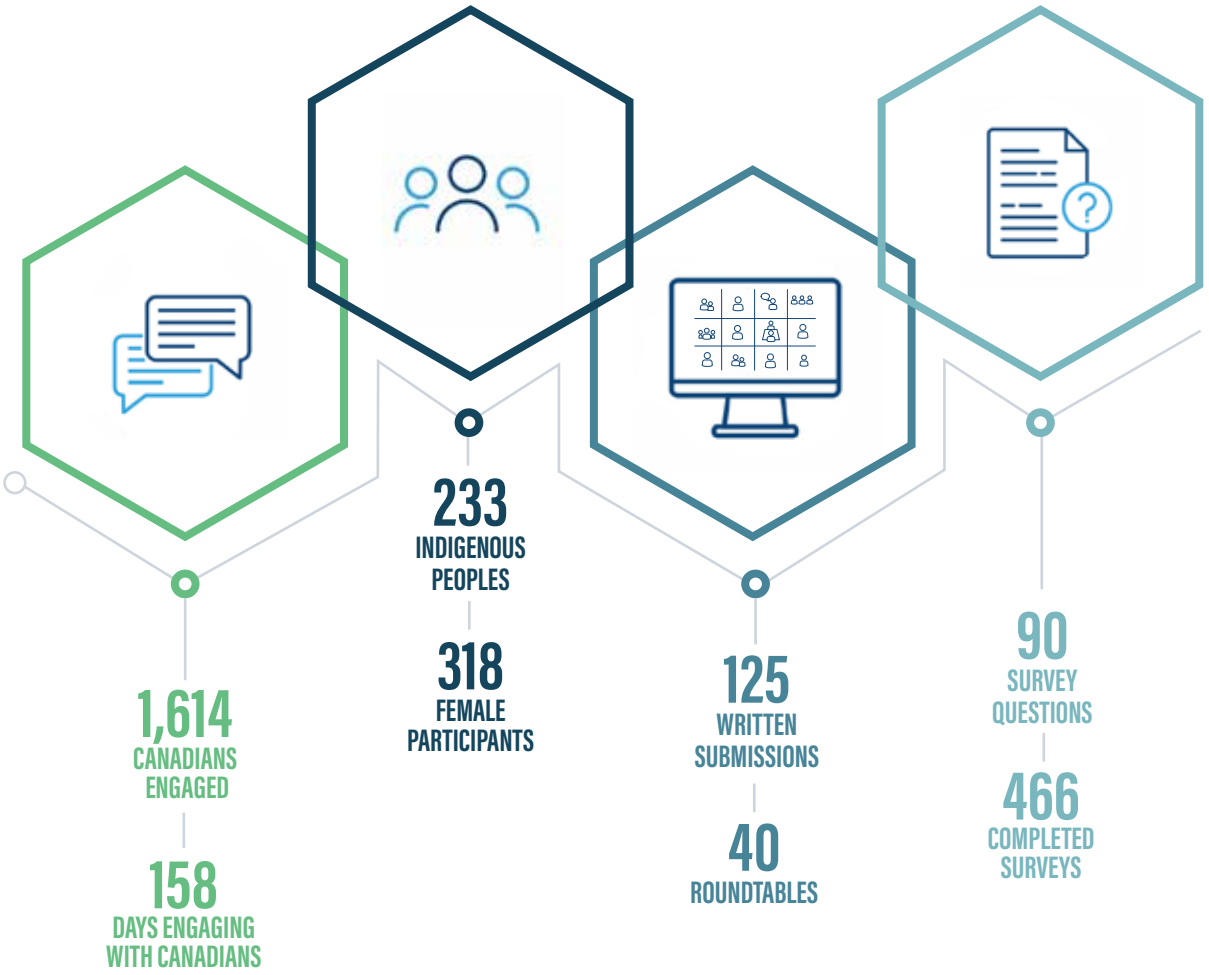
Engagement Statistics

Our engagement activities began on February 8, 2021 with the launch of **canada.ca/blue-economy** website, the release of our **engagement paper**, and the first week of ministerial **roundtables**.

The blue economy strategy engagement paper posed 90 questions. The **online survey** grouped these questions into 18 topics to allow Canadians to provide feedback on select areas of interest. A total of 466 responses were received through the survey and the website.

The engagement period was open for **158 days**, closing on June 15, 2021. During that time, **40 roundtables** were held in addition to targeted sector and regional engagement involving more than 1,614 participants, of which 223 identified as Indigenous peoples and 318 as women. We also received more than 125 written submissions.

> *"The timing is very good for the development of a blue economy strategy.*



Positioning our Blue Economy for Growth and Success

Canada's blue economy is complex. It takes place in, on and around a dynamic natural environment that supports an abundance of life, including the lives of Canadians as a source of food and a regulator of carbon and climate. The blue economy also occurs in a business environment with competing interests, evolving market access requirements, new and emerging technologies, and differing regulations. At the same time, it involves various levels of government and falls within the parameters of international agreements.

The following cross-cutting issues of our blue economy were identified in the engagement paper:

- Natural Environment
- Science and Data
- Innovation
- Business Environment
- Financing
- Market Access
- Regulatory Environment

Our engagement paper looked at each of these issues in depth and posed a number of questions for Canadians to consider. The issues were also discussed during each of our roundtables, including specific ones devoted to the environment, the conservation economy, and innovation.

What we heard ... broadly

There is consensus among the Canadians who participated in our engagement activities that positioning our blue economy for growth and success requires understanding and addressing the key cross-cutting issues identified in the engagement paper.

Above all, we heard that our oceans and marine resources must be healthy to be able to support a blue economy. To achieve this objective, it was recommended that we value the natural environment by taking action to protect, conserve, restore and rebuild our marine and coastal resources—and then maintain healthy oceans to ensure sustainable growth.

> *We need to acknowledge that this economy comes from the environment and the only way to grow the economy is to nurture ecosystems and start from a healthy place.*

We heard time and again that a blue economy strategy and our actions to mitigate and adapt to climate change are interconnected. Many indicated that the strategy needs to align with Canada's strengthened climate plan, the pan-Canadian framework on clean growth and climate change, and our international commitments to ocean health and sustainable development overall.

We also heard that we need to account for the full value of our oceans because the measure of the blue economy is about much more than employment and gross domestic product (GDP) growth. It also includes social, cultural, environmental and recreational value, and human well-being.

> *Undervaluing of marine ecosystem services was identified by both the High-level Ocean Panel and ... the DasguptaReview as a critical challenge of our time.*

The importance of data and knowledge sharing to inform the factors mentioned above was emphasized at every roundtable and in many written submissions. In particular, we heard that there is an urgent need to connect and align all of the sources of data about the ocean and marine resources, including Indigenous and local knowledge, so any gaps can be determined. We also heard about the importance of making data user-friendly and accessible to inform innovation and emerging sectors—and to improve decision-making. In addition, it was recommended that we should empower Indigenous peoples, fish harvesters and other coastal citizens to continue to collect and share data, while investing in other collaborative science activities.

> *There are many of us with common interests but we are not aware of each other.*

Collaborations, partnerships and networking were strongly supported throughout the engagement as a means to respect Indigenous knowledge alongside western science methods, and to ensure accessibility to non-proprietary knowledge and data. We also heard that this approach is needed to drive innovative solutions, build a competitive business environment, and improve industry regulations.

> *[Canada] needs innovation and action, including concerted efforts to radically progress how we harvest food, generate energy, transport goods, provide services, and digitally transform legacy industries.*

It was repeatedly mentioned that innovation and the research and development of new technologies are key to the blue economy objectives of healthy oceans and sustainable economic growth. We heard that innovations will help our sectors improve their operational efficiencies to become more competitive and resilient to external shocks. We also heard loud and clear that business and community resiliency was inextricably tied to modern, reliable and resilient infrastructure. This includes basic infrastructure in the Arctic, the North and other remote coastal communities, such as safe harbours and marine navigation systems, as well as reliable connectivity to the Internet.

During our roundtables, we were told that innovation drives the growth of small- and medium-sized enterprises (SMEs) which are essential to the future of larger ocean sectors and a doorway to new blue economy sectors. We heard many ideas about how government could support these

enterprises. It was suggested that this includes being a customer during the early stages of development, facilitating better access to government programs and lending capital, and improving our procurement processes to be more accessible to SMEs and appropriate to the pace of innovation.

We heard that access to government funding programs and to lending and equity capital is not just an issue for start-ups and SMEs; it is also a pressing issue for Indigenous businesses and larger ocean enterprises. Ideas such as blue financing that could support developing blue technology or an ocean venture capital fund were explored during our engagement activities. We also heard that consistent government decision-making and regulatory certainty was needed to support greater business investments in innovation, workforce development, and business diversification.

> *Through this strategy, we must deliver a strong and cohesive national ocean brand for Canada that will contribute to national pride and put a spotlight on our successes, growth, and potential in ocean sectors, attracting new markets and investment, and demonstrating leadership globally.*

Further, by enabling diversification and value-added production, we heard that blue economy sectors would be better able to retain and build their markets, including domestic markets. We also heard about the importance of helping sectors welcome international visitors and customers to our coastal communities and businesses, and enabling our marine transportation networks to sustainably move our manufactured goods within Canada and globally.

Throughout our engagement activities, we consistently heard that Canada needs to embrace its ocean identity and find ways to tell our ocean story—nationally and globally. Fisheries and aquaculture sectors, for example, called for a government 'champion' to support and promote their industries. While different options were suggested based on existing and potentially new government structures and roles, we heard that Canada's blue economy strategy needs, at a minimum, better integrated planning or "joined-up thinking" across involved government entities, including other levels of government.

> *None of this will work without a regulatory framework for industry.*

We also heard that the regulatory environment of Canada's blue economy needs consistency across jurisdictions to support dependable decision-making and to ensure that regulations are agile and responsive to innovation and emerging sectors. In addition, we were told that our policies need to align to the objectives of inclusion, diversity and equity to ensure Indigenous, under-represented groups and coastal communities across Canada benefit from the ocean and its resources.

The following **key barriers** to the development of a sustainable blue economy were identified by participants:

- Impacts of climate change and unsustainable practices
- Outdated, aging or insufficient infrastructure to support a modern blue economy
- Sector difficulties adopting and adapting to new technologies
- Sector challenges attracting workers and investors
- Sector difficulties accessing government funding programs and procurement
- Lack of access to capital
- Lack of data to inform decision-making
- Outdated regulations and inconsistent policies and decision-making
- Misperceptions by some Canadians about certain sectors or lack of social licence
- Lack of long-term vision and ambition for Government coordination

In turn, we were given specific input on the **actions** that the blue economy strategy should identify for governments and others to take in order to address these barriers. These recommended actions are listed under each topic in the following sections.

> Without wild fish, there is no blue economy.

> The connection of a healthy ocean to the economy is very powerful: a degraded ocean cannot sustain these activities.

> The protection and regeneration … of the environment [should] be the top priority of the Strategy, measured by the viability and enhancement of all things, living and nonliving.

> We can't look at the ocean to give us more until we reverse the declining trends.

Canada's blue economy and its future growth depend on healthy oceans. The pivotal role of the natural environment in the blue economy is a fundamental message that we heard from **all** participants in our roundtables and other engagement activities. The key role of Indigenous peoples as stewards of the natural environment, including in partnership with non-Indigenous groups, was also underscored in our engagement sessions and in written submissions. In addition, we received a set of ecological principles for a sustainable blue economy strategy from more than 20 environmental non-governmental organizations, including key actions to achieve each principle, and more than 5,000 Canadians signed Oceana Canada's petition seeking government action to rebuild depleted fish populations.

Overall, the key message we received from Canadians who participated in our engagement activities is to **value our natural environment** in the blue economy strategy.

To do this, it was recommended that we:

- **Use marine spatial planning to inform decision-making**
- **Account for the full value of oceans and its resources**
- **Invest in natural, ocean-based solutions to climate change impacts**
- **Invest in science and data collection**
- **Ensure a greater Indigenous role in environmental monitoring, governance and management of resources, including through the Indigenous Guardian Program**
- **Align the blue economy strategy to Canada's domestic and international climate change, clean growth and sustainable development commitments and targets**
- **Accelerate actions to conserve, protect, restore and rebuild marine ecosystems, including wild fish stocks and other aquatic resources**
- **Recognize the conservation economy as a blue economy opportunity**

> Research is a catalyst for economic development.

> Western science and Indigenous knowledge must be considered synonymously to inform the best decision-making for government, industry, and communities.

> What gets measured gets managed.

> ...Knowledge and cultural commons, such as open data, scientific research, Internet and free libraries, are part of common wealth.

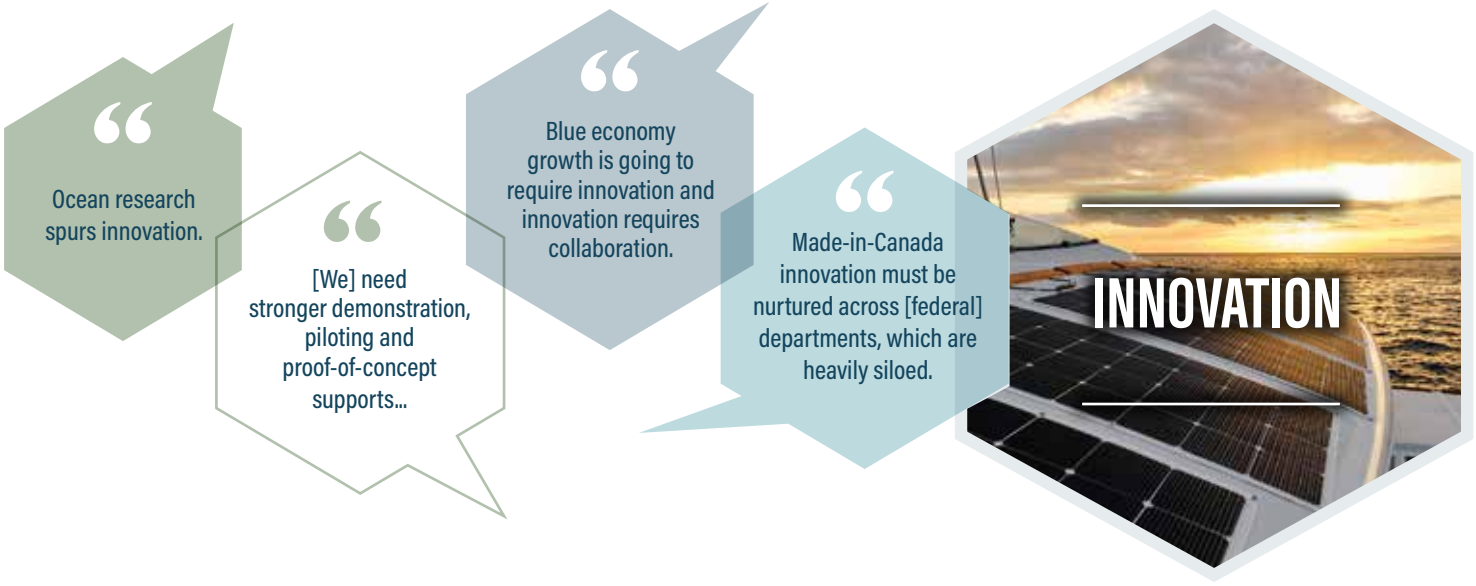
> We're not going to be able to build the blue economy without proper knowledge to make decisions in real time.

Data collected through sustained ocean observations, measurements and forecasts enable the majority of Canada's blue economy sectors to operate. Data and other information and knowledge also help us understand the impacts of economic practices, transportation activities and climate change.

Canada is a recognized leader in ocean observation and research. During our engagement activities, we heard that Canadians want to remain a leader in these areas and that this requires data connectivity, interoperability, and validation among groups and people who are collecting the data. We also heard that Canada has data and information that would be more useful if it were brought together within common platforms and made accessible. Participants in every roundtable we held stressed the importance of data and knowledge from multiple sources to inform decision making and improve the ongoing operations and competitiveness of the ocean economy.

To further **advance ocean observation, data collection, and world-leading scientific research**, it was recommended that we:

- **Encourage networking, collaboration and partnerships to increase the interoperability, usability, and application of data, information and knowledge sharing**
- **Invest in innovative data collection and sharing tools**
- **Support Indigenous, fish harvester, marine pilot, and citizen science and data collection**
- **Leverage Canada's existing strengths in ocean observation and ocean sensor technologies**
- **Fill data, information and knowledge gaps by investing in science, data collection and data analysis**



Ocean innovation is an important driver of economic growth and a source of well-paying jobs across Canada. Innovations are changing the business models of ocean industries to foster sustainable use of resources, while increasing efficiencies and productivity. They are also making ocean sectors more adaptable to the impacts of climate change, while reducing their carbon footprint and effect on marine ecosystems.

During our engagement activities, we heard that **Canada has a number of strengths** on which to draw to address environmental and business needs, such as:

- A highly skilled pool of talent in research & development, innovation and science
- Ocean technologies development, Oceans Network Canada, and innovation hubs, such asthe Ocean Supercluster
- An exceptional ocean and coastline environment in which to innovate
- A wealth of Indigenous and local knowledge

To drive **innovative solutions and advance business modernization**, we were advised to leverage our strengths in innovation. It was also recommended that we:

- **Expand support to small- and medium-sized enterprises; especially, at the demonstration and commercialization stages**
- **Ensure enterprises can access government funding programs and procurement processes**
- **Encourage collaboration and networking between innovators and sectors, including post-secondary research and development institutions**
- **Leverage existing, and facilitate the development and adoption of new, technologies**
- **Use flexible regulatory approaches that facilitate innovation and timely decision making**
- **Foster the next generation of talent and skills development in science, technology, engineering and mathematics (STEM) fields**

> Help prove and refine technologies by being an early customer for Canadian businesses.

> Small craft harbours are the front door to ocean economies and community networks.

> We need 'anchors' in certain regions.

> The more [we] can attract world-class innovators, world-class talent and globally connected capital, supply-chains and solutions, the more competitive [we] will be over the long term.

There is consensus that the business environment of Canada's blue economy sectors is influenced by events and trends that affect the world-wide economy. The COVID-19 pandemic is a clear example of a global event which exposed vulnerabilities in the business models of some sectors. Future trends, such as a growing global population, the rapid pace of technological change and climate change, are also expected to continue shaping the needs of businesses across blue economy sectors.

During our engagement activities, we heard that the blue economy strategy needs to **cultivate a business environment that drives competitiveness, facilitates operational stability, and enables long-term resilience.**

To do this, it was recommended that we:

- **Establish robust and agile regulations**
- **Improve access to lending and capital**
- **Facilitate access to talent**
- **Support industry adoption of advanced technologies**
- **Promote Canada's existing strengths in ocean sectors**
- **Invest in modern, reliable and resilient infrastructure**
- **Close infrastructure deficits in remote areas, such as Canada's Arctic**
- **Expand support to start-ups and other small-and medium-sized enterprises**
- **Encourage collaboration and networking across sectors**

During our engagement activities, we sought feedback from Canadians on ways to improve private sector financing within the blue economy so it would align with sound environmental stewardship, such as 'blue financing' which helps restore and protect the marine environment, while supporting sustainable economic activities in the ocean.

In response, we heard that Canada lacks private investment opportunities for blue economy sectors and that access to capital is a pressing issue for start-ups and SMEs, Indigenous businesses, and even larger industries.

To help sectors access more lending and equity capital, it was recommended that we:

- **Demonstrate government support for start-ups and SMEs by adopting innovation and new technologies at early stages**
- **Ensure access to government funding programs and capital supports**
- **Ensure government collaborations and other partnerships**
- **Enable a competitive and resilient business environment**
- **Ensure sector certainty through consistent decision making and regulations in order to enable longer-term investments**
- **Facilitate the development of tools, such as blue bonds, a blue technology fund or an ocean venture capital fund**

> Government should speak with the same voice as industry during trade shows.

> Boat-to-plate traceability is a way to get better economic returns on existing activities.

> We need to become better storytellers.

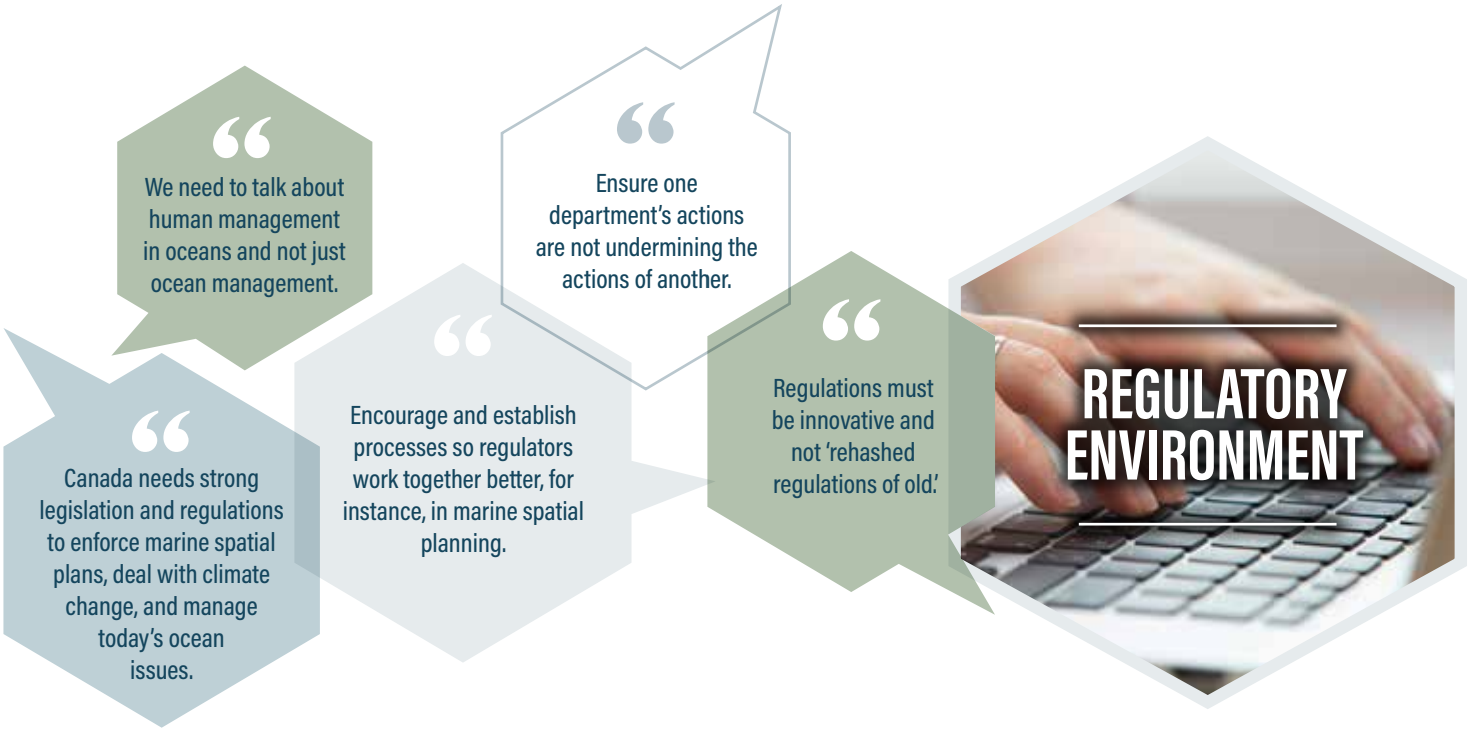
> The blue economy strategy should encourage domestic consumption of seafood.

The global economy continues to address the challenges of, and recovery from, COVID-19. During our engagement activities, we heard how ocean-based sectors were significantly impacted by the pandemic and how industry rallied to continue operations. We also learned that while actions such as developing domestic and local markets were helpful, they were insufficient to sustain all of our blue economy sectors.

We heard from a majority of participants that international trade and investment will remain as key drivers of Canada's economy.

To **retain and build market access** for blue economy sectors in the short and long term, it was recommended that we:

- **Improve how Canada markets its ocean sectors at home and to the world**
- **Leverage the "Canada Brand" when marketing ocean sectors as it is well recognized in export markets**
- **Sustain and build domestic markets created during COVID-19**
- **Rebuild, diversify and expand export markets**
- **Enable sectors to attract international visitors and customers**
- **Involve the marine shipping sector as the primary transporter of exported goods**
- **Identify federal industry champions for the fisheries and aquaculture sectors**



Many of today's blue economy sectors are subject to ocean management planning and industry-specific regulatory frameworks that are intended to enable development, innovation, and long-term investor confidence, while ensuring environmental protection and sustainability. During our engagement activities, we heard from the aquaculture and ocean-based energy sectors that current regulations do not allow them to operate with predictability and certainty. We also heard from these and other sectors that decisions are often inconsistent across regions and that the factors informing decision making lack transparency. Moreover, we heard on ***many*** occasions that Canada's regulations are out of date, slow to adapt, and overly cumbersome.

The regulatory environment of each ocean sector is explained in more detail in the third part of this report. Overall, we heard that Canada needs strong, modernized legislation and regulations, including the *Oceans Act*, to enforce marine spatial plans and manage today's oceans issues using marine spatial planning.

To establish **robust and agile regulations, policies and decision-making frameworks** that will support blue economy growth, it was also recommended that we:

- **Fill regulatory gaps to provide certainty for existing and emerging sectors**
- **Use flexible regulatory approaches that facilitate innovation and timely decision making, while avoiding undue administrative burden**
- **Use integrated planning tools across government and stop working in silos**
- **Use up-to-date science and data to inform decision making**
- **Align policies to achieve regional equity and greater consistency across sectors**
- **Utilize marine spatial planning as a tool and do so in an inclusive and transparent way**

Ensuring Growth and Prosperity for all

> ...We cannot assume that equity will happen by itself, we have to make a concerted effort to support it.

> If you want it to be a success, the blue economy strategy needs an Indigenous component that covers the whole spectrum of skills and training: from basics to jobs to careers.

> We have momentum right now and, if it continues, youth will follow.

> Gender and cultural diversity improves economic growth.

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" post-pandemic to include more Canadians in these opportunities and their benefits; especially, Indigenous peoples and other under-represented groups in blue economy sectors.

Our engagement paper identified three key ways that the blue economy strategy could foster more prosperity and inclusion in Canada's ocean sectors:

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

During our roundtables and meetings, we also discussed maximizing the current workforce and building a pool of talent for the future employment needs of the blue economy. This includes discussions with Indigenous leaders and groups in all three ocean regions, and with women and youth specifically. Other sector and thematic roundtables also raised the importance of inclusion and diversity to Canada's blue economy.

In addition, Canadians were invited to respond to more than 20 online survey questions on this topic, so we could hear a wide range of views on how to increase the involvement of under-represented groups and build the workforce and talent needed in our blue economy.

What we heard ... broadly

There is consensus among those we engaged that increasing inclusion and diversity in ocean sectors is an essential part of building a resilient and sustainable blue economy.

> *Align the goals of the blue economy strategy to benefit all Canadians.*

First and foremost, we heard that the development of our blue economy strategy is an important opportunity to advance reconciliation between Canada and Indigenous peoples. We also heard that Indigenous governments, communities and groups want to be more involved in the blue economy both to protect and restore marine environments and to increase and diversify ocean-related economic opportunities aligned with their priorities and values.

> *The participation of Indigenous peoples will be achieved by establishing constructive and attentive relationships between governments, Indigenous Nations and the various partners.*

Indigenous communities and non-Indigenous coastal communities are often dependent on a limited range of economic activities taking place in, around and on our oceans. We heard this message at many roundtables and it was underscored in many submissions. We also heard that these communities are not always benefitting from ocean-related activities occurring in adjacent waters.

Some groups recommended that social equity (the absence of unfair and unavoidable cost and benefits distributions) and social justice should be central to the blue economy. It was also recommended that governments should make an effort to ensure that all participants in Canada's fisheries are able to build a shared understanding of inclusion policies and procedures.

> *Inclusive governance provides opportunities for communities to articulate what they want and how activities should be managed.*

Those engaged pointed to research that suggests improving gender equity in the blue economy can improve maritime sustainability and technological innovation, while creating new markets and job opportunities. The notion that women and youth could be agents of positive change to integrate innovation into remote and coastal communities was also raised by participants in our engagement activities. However, we were reminded that each ocean sector faces its own inclusion and diversity issues and there are no "one-size-fits-all" solutions.

Youth do not always consider careers in the blue economy nor are they aware of the many emerging technology-based employment opportunities within ocean-based sectors. This challenge was highlighted in our engagement paper and it was also discussed at many roundtables. We heard that it was important for ocean sectors to adapt to generational values, innovation, and interests when recruiting youth because they inherently understand the relationship of sustainability and economic development. We also heard that ocean sectors stand to benefit when they hire talented and educated youth with new skills and ways of thinking.

> *The blue economy strategy must show that it is not just economy-driven to attract youth to ocean sectors.*

At the same time, we heard that there is an urgent need to fill existing and anticipated labour shortages across many ocean sectors using both intergenerational succession and inclusion strategies. There is also strong support for education, training and skills development programs for new and existing workers in these sectors, including specific programs for Indigenous peoples and other under-represented groups. Moreover, it was recommended that ongoing workforce renewal should be a key priority of the blue economy strategy.

During the course of our engagement activities, we heard that Canada's three ocean regions experience unique issues and opportunities that may require "place-based" solutions; especially, in the North and the Arctic. It was also noted by many participants that the Great Lakes, St. Lawrence

Seaway, and Hudson Bay each have an integral role to play in, and to benefit from, Canada's blue economy strategy.

> *By including the Great Lakes in the Blue Economy Strategy, prosperity will be brought to all of Canada…*

Overall, there is agreement that we should address the **barriers** that Canadians told us are preventing Indigenous peoples, women, youth and other under-represented groups from fully participating in the blue economy. These include:

- Lack of awareness about the careers and business opportunities in blue economy sectors
- Misperceptions about ocean-related careers
- Difficulties accessing local and affordable education and training
- Lack of clear career pathways to ocean-sector jobs
- Difficulties accessing government funding programs and procurement processes
- Infrastructure deficits, including lack of reliable and accessible Internet connectivity
- Lack of access to capital by small- and medium-sized enterprises
- Safety concerns

We also heard that some Canadians have difficulty accessing certain fisheries due to the state of the resource or the historical allocation of licences and quota. Others may be hesitant to participate in ocean sectors, such as aquaculture or renewable energy, because they are uncertain about the level of government and public support for these industries over the longer term. In addition, we heard that some economic ventures pursued by Indigenous entrepreneurs and communities encounter **unique barriers to investment**.

Canadians gave us a lot of feedback on the actions that the blue economy strategy needs to identify for government and others to take in order to address these barriers. These **actions** are organized under the following topics:

- Inclusion, Diversity and Equity Overall
- Managerial and Decision-making Roles
- Indigenous Peoples
- Coastal Communities
- Gender Equity
- Intergenerational Equity
- Labour Force and Skills Development
- Equitable Distribution of Benefits
- Regional Equity

> Create the blue economy 'story so people can understand the space and be more apt to participate.

> Reinforce being in a marine community: It's not a job, it's a career and you can move up in the marine community.

> Ocean literacy is the gateway to awareness of opportunities, including training and careers.

> You measure what matters and what matters gets measured.

INCLUSION, DIVERSITY AND EQUITY

To support and improve inclusion, diversity and equity overall in Canada's blue economy, it was recommended that we:

- **Promote ocean-related careers and the ocean environment**
- **Encourage ocean-related curricula in education and training, in collaboration with provincial and territorial partners**
- **Support more accessible and affordable education and training options**
- **Invest in infrastructure that enables ocean users to participate in blue economy activities**
- **Use innovation and technology solutions to address safety concerns**
- **Incentivize increased diversity in training, education and sectors**
- **Improve data on labour demographics and measuring inclusion**
- **Support non-governmental initiatives helping under-represented groups become more involved in blue economy activities**

MANAGERIAL AND DECISION-MAKING ROLES

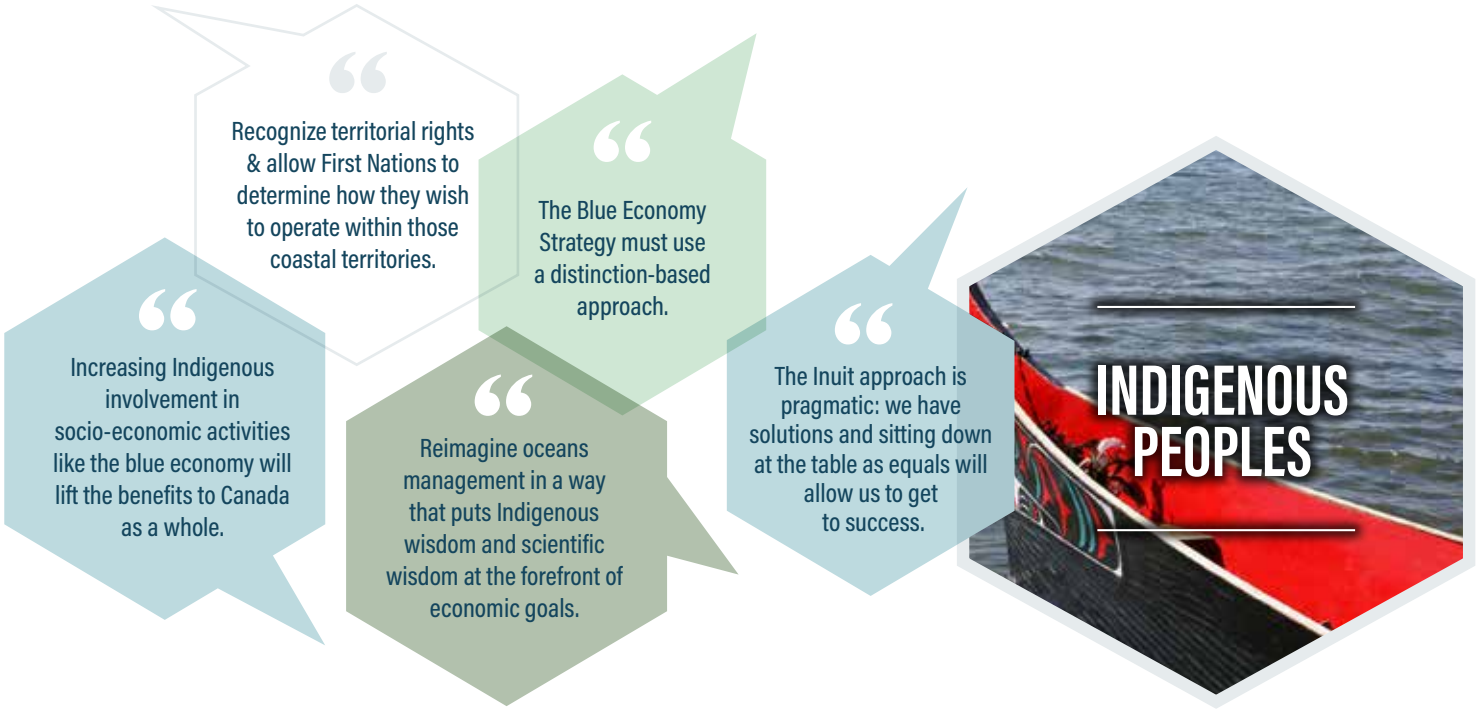
> In some cases, under-represented or equity-seeking groups require a strategic approach to engagement and recruitment.

> We're going to need... role models to provide opportunities to Indigenous youth.

> Coastal communities, industry workers, and Indigenous groups and nations need to be heard when they speak up and share their intimate knowledge of the marine environment and the impacts growth is having in their homes.

To increase the proportion of under-represented groups in managerial and decision-making roles in the blue economy, we were advised to:

- **Promote role models in ocean sectors**
- **Support targeted recruitment and hiring initiatives**
- **Incentivize increased student and training supports**
- **Involve under-represented groups in ocean governance and decision making**



Indigenous peoples, communities and governments are valued partners in the growth of Canada's blue economy and our efforts to protect and conserve ocean spaces. There is widespread support for our blue economy strategy to be used to increase and diversify ocean-related economic opportunities for Indigenous communities that are aligned with their values, priorities and aspirations. We also heard numerous times that the strategy is an opportunity to advance reconciliation by recognizing the rights of First Nations, Inuit and Métis peoples.

From the very start of our engagement activities, we heard that it was essential to ensure the participation of Indigenous peoples in these activities so their voices and perspectives would be heard: "*Engage first, engage often*." This was echoed in other round tables, in submissions, and in responses to online survey questions. We also consistently heard optimism with regards to the opportunities that a blue economy strategy could bring to Indigenous peoples and coastal communities across Canada—and its emphasis on inclusion and diversity.

We posed a number of questions in our engagement paper to gather different perspectives on how the participation of Indigenous peoples in the blue economy could be increased, including in each sector. One of our round tables was also devoted to Indigenous training and skills development to hear from experts in this area.

To **increase Indigenous participation** in the blue economy overall, it was recommended that we:

- **Respect and recognize Indigenous rightsholders and their unique role in the blue economy**
- **Ensure a greater Indigenous role in environmental monitoring, governance and the management of resources, including through the Indigenous Guardian Program**
- **Invest in infrastructure in Indigenous communities**
- **Find opportunities to bring together Indigenous and western knowledge and approaches**
- **Enable partnerships and collaborations, including through procurement opportunities**
- **Support more accessible training, skills development and other capacity building activities**
- **Focus on recruitment and retention by ensuring skills development supports meaningful career development**

To increase **Indigenous participation** in specific blue economy sectors, we also received the following recommendations:

Commercial fisheries

- Increase access to licences, quota and allocations in adjacent waters. "*It's eye-opening to me that part of Canada with considerable adjacency to the resource has so little access to it.*"

Aquaculture

- Meet the needs of communities that want to participate in land-based recirculation and/or shellfish ventures, as well as those who want to pursue and/or remain in finfish salmon operations. Support communities who wish to participate in seaweed cultivation. "*Governments need to provide support for Indigenous peoples, communities and organizations that are interested in aquaculture development—in whatever responsible manner this will take place.*"

Marine and coastal tourism

- Collaborate with Indigenous, national, provincial and territorial tourism organizations in supporting communities interested in developing eco-tourism and experiential tourism in coastal and marine areas.

Ocean-based energy

- Create training opportunities for Indigenous peoples that will help them enhance their capacity to construct and install renewable energy systems. *"[We] recommend competitive bidding processes…to partner with communities to develop marine renewables among other sustainable energy projects."*

Ocean technology and innovation

- Expand successful pilot projects and support Indigenous-led ventures to build skills and inclusion in ocean technology and innovation sectors. For example, the *Crowd-source Bathymetry* pilot project has trained Indigenous people to use hydrographic technology to do surveys, which is contributing to nautical charting in remote areas and building Indigenous capacity for marine spatial planning. The *SednaLink* fiber optic network between Iqaluit and Newfoundland and Labrador plans to use science, monitoring and reliable telecommunications (SMART) cables that have spurs to collect marine intelligence and environmental monitoring in real time, which will create long-term employment for Inuit who want to participate in research. SmartICE is also building climate change adaptation tools that involve Inuit and incorporate Inuit knowledge to inform better decision making.

To increase Indigenous Participation

Multiple sectors

- Replicate and/or build on marine-related initiatives that have successfully increased the number of Indigenous people participating in blue economy sectors, such as the *Pathways to Shipbuilding Programs*, and use government procurement processes to require Indigenous participation in companies bidding on ocean-related tenders. *"We have always been on the coast and our economy is based on sea resources. The federal government had to help us understand what some of the opportunities could be because communities didn't know how some of the bigger industries worked."*

> The priority of our laws and regulations needs to be the well-being and health of coastal communities, local resources, and their stewards—now and in the future.

> Get practical in this with communities in terms of impact benefit agreements, including hiring benefits. With ownership in an economic activity, the community can make decisions about it and they can help facilitate markets.

> Think carefully about who should benefit from the blue economy strategy... put communities at the heart.

> Equitability is damaged when the benefits of marine resources are extracted away from coastal communities.

There is consensus among the participants in our engagement activities that Canada's oceans are tightly woven into the economic, social, and cultural fabric of coastal communities. However, we heard that coastal communities located in remote and northern areas of Canada need investments in basic- and business-related infrastructure, as well as access to local and affordable education, training and skills development, to better benefit from ocean-based sectors.

We also heard that the blue economy strategy should consider leveraging the local assets and potential of coastal communities, such as coastal and marine tourism attractions, harbours and other marine services, and specific fisheries. In addition, we heard that some communities would benefit more from developing their local economies as opposed to relying on national and international industrial players. This includes, for example, local economies that produce goods and services for local use and consumption, and only hire and procure locally.

To use the development of Canada's blue economy strategy to create opportunities for coastal communities overall, it was recommended that we:

- **Protect independent owner–operator fish harvesters to ensure benefits are retained in coastal communities**
- **Support coastal, municipal, and Indigenous government initiatives to plan, develop and finance solutions to key community infrastructure challenges**
- **Invest in coastal infrastructure in support of community economic development objectives, including 'anchor' tourist attractions**
- **Support more accessible and affordable education and training options in communities**
- **Support the economic development of large-scale, small-scale, inshore and subsistence fisheries in remote, northern and Arctic communities**
- **Ensure the involvement of coastal communities in marine spatial planning**

Some of Canada's blue economy sectors are successfully including women in the workforce. For example, we heard that the Atlantic tourism industry has a very strong female presence. We also heard that a number of women are in leadership roles in some ocean sectors, including at the executive level in the fish and seafood industry and as owners of ocean-related companies.

While these examples signal progress toward gender equity, during the course of our engagement activities, we heard that most ocean sectors still tend to be male-dominated. We also heard that much more needs to be done to level the playing field and to ensure better representation of women in the higher-paying careers of industries that support the blue economy. This includes science, technology, engineering and mathematics (STEM)-based careers.

We received a lot of consistent input on ways that the Government of Canada could take action to advance gender inclusion and equity in the blue economy.

For example, it was recommended that we:

- **Prioritize diversification of the pool of talent required by ocean sectors**
- **Use and improve procurement vehicles and strengthen procurement capacities**
- **Leverage existing gender-directed programming**
- **Develop policies and program incentives to increase gender equity**
- **Support the alignment of education, training and skills development with gender inclusion best practices**
- **Raise awareness of ocean sector opportunities and connect women and other under-represented people with these opportunities**
- **Use innovations to reduce safety concerns and other barriers preventing women and 2SLGBTQIA+ Canadians from participating in the blue economy sectors**

> Younger generations are more aligned to small-scale sustainable fisheries.

> Our youth want to steward the land and our Elders want to show them how to do it.

> Our youth are there, but experiences are not. Having access to industries is a huge part of raising interest.

> Every kid... is interested in the ocean. Start young to get people engaged and qualified for the ocean economy.

> The biggest hindrance is not exciting youth. We are digital and we must grow that.

There is consensus among participants in our engagement sessions that fostering more inclusion and diversity in Canada's ocean sectors will help fill current labour shortages, while setting the foundation for a sustainable labour force over the long term. We also heard that involving youth in the blue economy workforce would help ensure intergenerational equity and position industries for tomorrow's workforce.

During our engagement activities, we held a roundtable with youth who are presently working in blue economy sectors to learn from their experiences. We also had participants under the age of 35 at other roundtables and meetings.

To help us achieve intergenerational equity through the blue economy strategy, the recommendations put forward during our engagement activities were consistent. They include:

- Adapt to generational values, innovation and interests
- [Re]Build youth connections to the ocean
- Develop and communicate clear career pathways
- Support experiential learning opportunities
- Support sector strategies to introduce youth to career opportunities

These ideas are interconnected with what we heard to support inclusion, diversity and equity overall, and what we heard to increase the proportion of under-represented groups in managerial and decision-making roles; namely, the importance of promoting ocean careers and role models, targeting recruitment, and increasing ocean literacy.

> For every dollar invested in First Nations to build capacity, you will get $10 in return.

> The jobs of the future… will require computer literacy and likely coding skills. The current manual labour jobs are being automated and… there will be a greater need for workers with post-secondary education … in STEM fields.

> We want better and more accessible training: shorter courses and targeted training

> Renew old models of offering two- to four-year contracts to new graduates in return for waiving student loans.

During our engagement activities, we received a lot of feedback about the labour and workforce renewal needs of specific ocean industries and the blue economy as a whole. The majority of sectors, for example, are experiencing significant labour shortages, and while under-represented groups offer significant workforce potential, we heard that Canadian sources of labour may not always be enough to fill the gaps.

Workforce, Labour Force and Skills Issues by Sector

In addition to the labour, workforce, and skills development issues identified earlier in this section, we heard about the specific needs of ocean sectors. For example:

Commercial fisheries have an aging workforce and the intergenerational transfer of licences and quota to youth is hampered by the high cost of entry and to purchase a vessel, alongside limited access to capital. Fisheries are also looking for marketing specialists to assist with certification, traceability and sales needs. To resolve these issues, it was recommended that we:

- Change licensing and management policies to support new entrants and facilitate access to capital
- Develop a national training/certification program modelled on Red Seal trade programs for fish harvesters
- Create a Youth Fish Harvesters' Employment and Skills Program similar to one offered by Agriculture and Agri-Food Canada for youth farmers
- Collaborate with industry organizations that are set up to deal with fisheries human resource needs and solutions

> *Invest in the next generation of fish harvesters.*

Workforce, Labour Force and Skills Issues by Sector

Aquaculture has successfully attracted youth, Indigenous peoples, and workers in STEM fields to the sector, but we still heard that there are labour shortages and that training and education is needed to develop the aquaculture workforce. There are also specialized labour needs in this sector, such as needs for veterinarians. At the same time, we heard that the downtrend in some forms of aquaculture and decisions (for example, to phase out salmon farming in British Columbia) have resulted in job losses for a number of skilled workers, including trained ocean science specialist. To address some of these issues, it was recommended that we:

- Support education, training and skills development programs for aquaculture
- Incentivize more academic support for aquaculture across Canada, including a Master's program and inclusion in marine biology curricula in each year of a degree
- Support the research and development of automation solutions

> *"Much of [our] expertise will be lost to Canada if we don't aim to keep these people employed.*

Fish and seafood processing is dealing with acute labour shortages as the sector is unable to find local people to fill vacant positions, let alone the new positions required to meet growth opportunities. In addition, processing workers need differing skills to work in many of today's facilities; especially, for value-added products. To address the labour shortage, we received a number of specific recommendations:

- Utilize the career ladder for fish and seafood processing developed by Food Processing Skills Canada
- Revive the Career Focus Wage Subsidy Program for processors
- Streamline the immigration process
- Change the Atlantic Immigration Pilot Program to be inclusive of seasonal fish and seafood processors
- Create a flexible, cost-effective Seafood Temporary Foreign Workers' Program similar to the program designed for agriculture
- Find collaborative community solutions to housing shortages

> *"We're leaving big money on the table because we don't have workers.*

Marine transport also has an aging workforce and the sector needs to find ways to enable faster, viable and more affordable career advancement of deckhands to mates, and mates to captains. We also heard that current and future marine transport workers need training to use advanced technologies. To resolve these and other labour force issues, it was recommended that we:

- Support sector initiatives that promote career opportunities, such as the Imagine Marine Youth Movement and 'Be a Seafarer' campaign

Workforce, Labour Force and Skills Issues by Sector

- Support education opportunities for new entrants, including those in skilled trades, technologists, professionals and advanced researchers, and establish career pathways to ensure advancement opportunities
- Explore how training curricula could be formalized into recognized apprenticeship programs and higher education accreditation
- Review and update training and certification of marine pilots to reflect navigational changes and the introduction of new technologies
- Collaborate with marine training institutes to develop upskilling opportunities and revise regulations to enable advanced technology training (i.e. online simulation of vessel operation)
- Bring industry and training institutes together to ensure all students can get on vessels to gain their required 364 days of experience
- Encourage sector efforts to improve on-board life and work conditions to help address labour retention issues and encourage the participation of women
- Work with Inuit partners and training institutes to create a cadre of well-qualified northern and Arctic navigational experts

> *"Capacity and expertise in marine transportation is the lowest that it has been in 30 years—both in the federal government and the sector itself.*

Shipbuilding and boatbuilding, including repair and other marine servicing are experiencing labour shortages and an older workforce. We heard that schedules need to be better coordinated with industry to prevent the glut-shortage work cycles in many shipyards and that national occupational classifications need to be disaggregated from generic categories. We also heard that boating apprenticeships need to be recognized and specialized training and certification (e.g., for boat painters, coaters, and electricians) need to be more frequently offered and locally accessible. Overall, we heard that companies need access to skilled personnel and those in specialized trades—as well as competent, reliable lower-skilled workers. To help to address these issues, it was recommended that we:

- Increase incentives for labour force expansion and initiatives to overcome regional competition for labour
- Recognize boatbuilding and marine services trades in apprenticeships, certification programs, and within their own national occupational classifications
- Replicate and/or build on the *Pathways to Shipbuilding Programs* to continue to increase the number of under-represented groups in the sector
- Enable immigration solutions that can be shared across blue economy sectors

> *"We need at least 1,000 workers, 500 in repair and 500 specialists, in the next five years.*

Workforce, Labour Force and Skills Issues by Sector

Coastal and marine tourism in Atlantic Canada is undertaking a 'Discover the Strait' pilot project to help fish harvesters become tourist operators in the off-season, including Indigenous fish harvesters. There is consensus among participants in our engagement activities that career transition funding and training between and among blue economy sectors could offset some of the labour shortage issues. However, we were told that this may take time. For example, we heard that it takes four years to transition oil and gas workers to the shipbuilding industry. We also learned that eco-tourism in Atlantic Canada needs local education and Canadian Outdoor Leadership Training (COLT) certification.

> *"...Our marine skillset and our dollar value are favourable compared to the US and EU.*

Ocean-based energy sectors have different labour and skills development issues and approaches. For example, the oil & gas sector has invested in advancing the skillset of its workforce and is presently collaborating with a private institution to prepare employees for the digital skills that will be required in the future. The marine renewable energy sector, meanwhile, requires joint education and training programs to be developed either in Canada or with other countries, to train its workforce.

> *"We risk losing that talent, which will not only be needed for the oil & gas industry, but is widely recognized as essential to energy transition.*

Ocean technology and innovation recommended the creation of better university partnerships to support ocean research and development of education curricula. While this sector has a stable workforce at present, we heard that they always need more STEM-trained workers. We also heard that other ocean sectors are looking for ocean technology and innovation workers to join their workforce, as well as software developers and marketing specialists.

> *"[Canada's] private sector has a wealth of experience in ocean engineering, logistics and supply chains. Its academic institutions are known globally for their expertise in supporting ocean industries ...*

We also heard from multiple blue economy sectors that it would be beneficial for human resource studies undertaken and completed by sector organizations to be shared and accessible through an online databank or other repository.

EQUITABLE DISTRIBUTION OF BENEFITS

> Expand prosperity and growth metrics: it's not just jobs and gross domestic product. Human well-being and ecological integrity are other metrics.

> [We've] seen a huge loss of harvester and community control over fishing access and significant declines in the socio-economic and cultural benefits...

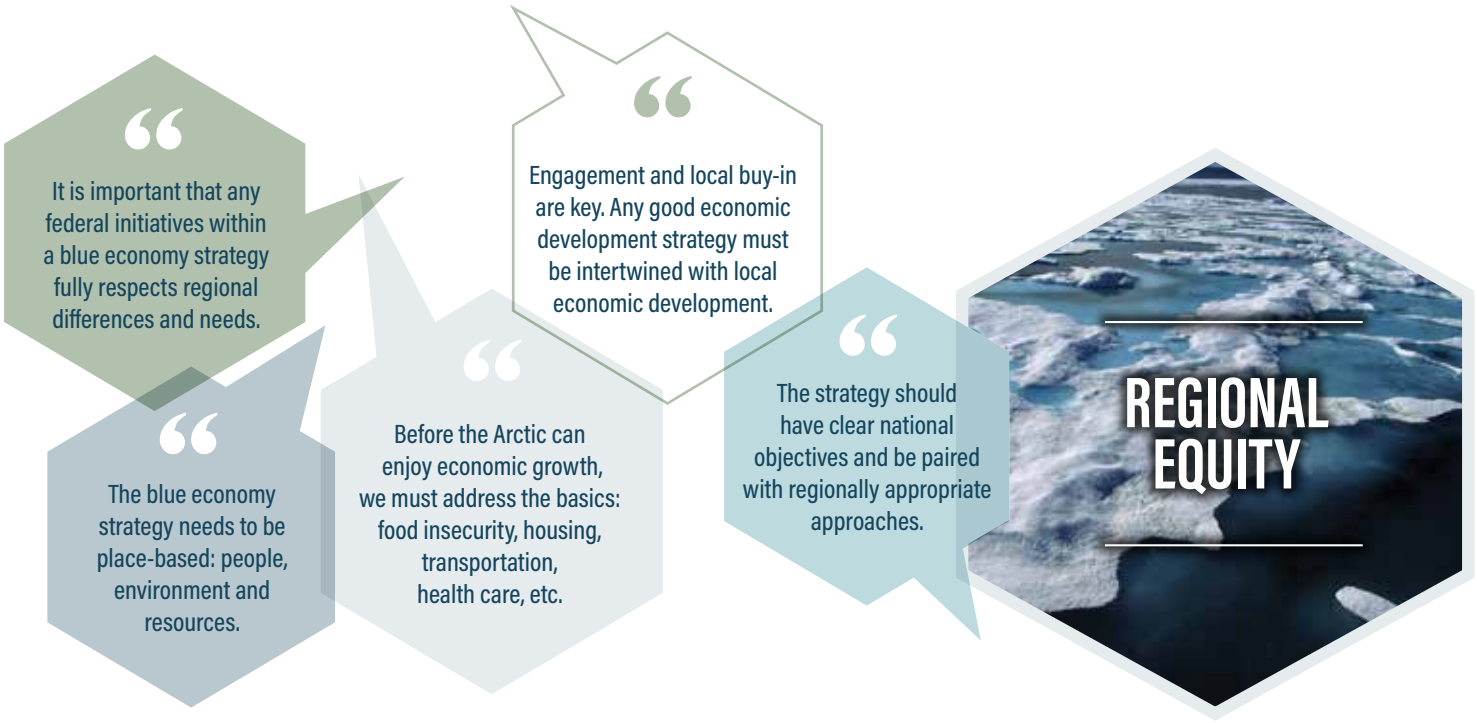
> It's a mistake to assume that communities are going to benefit. Historically, they've been marginalized, excluded and subject to the pollution and other harms.

> Equitable distribution of benefits is about ensuring sensible and fair socio-economic policies.

To ensure the benefits of Canada's blue economy are equitably distributed, Canadians recommended that we take the following actions:

- **Prioritize the socio-economic well-being of coastal communities**
- **Protect independent owner–operators in commercial fisheries and support Canadian innovation**
- **Recognize the conservation economy as a blue economy opportunity**
- **Ensure equitable access to government funding programs and procurement processes**
- **Encourage collaborations and networking**
- **Involve coastal communities and ocean users in marine spatial planning decisions**

In particular, we heard that many Canadians want coastal communities and smaller operations owned by residents to benefit from the activities taking place adjacent to their communities and in local waters. To achieve this objective, it was recommended that we follow the principles of social justice to ensure the benefits and access rights to ocean resources and spaces are evenly distributed. For example, adjacency issues could be given significant weight during the hiring process, a "dividend" of economic activities in local waters could be directed to adjacent communities that were not otherwise benefitting through jobs and spin-off activities, and an extensive marine cadaster could be developed to show ownership and rights.



We heard that regional equity is another way to ensure that the benefits of Canada's blue economy are equitably distributed. Regional equity aims to eliminate policies and practices that create and prolong socio-economic and environmental inequalities between regions of Canada.

During our engagement activities, we received input concerning specific regions of Canada, including the Arctic, Atlantic, Pacific and inland regions, along with Indigenous regions, such as Inuit Nunangat. We also held roundtables with partners and stakeholders in specific regions to ensure any regional needs that the blue economy strategy could address would be well understood. The input we received has been incorporated into various parts of this report, such as rebuilding licensing and fisheries management policies in British Columbia to protect independent fish harvesters, and considering the Great Lakes, St. Lawrence Seaway, and Hudson Bay in the development of the strategy.

It was also recommended that we take the following actions:

- **Involve local coastal communities, including Indigenous communities, in the planning and implementation phases of the blue economy strategy**
- **Consider jurisdictional realities at national, provincial, territorial, municipal and Indigenous levels**
- **Enforce the new inshore regulations to protect owner–operators in Atlantic Canada and Quebec and ensure benefits are realized locally**
- **Evaluate the impact of foreign investment and/or ownership in Canada's fisheries to ensure that the economic benefits of fish harvesting largely benefit coastal communities**
- **Include financial, technical and logistical support for community economic development initiatives, such as food processing facilities and inshore fisheries**
- **Ensure regions play a key role in determining the environmental practices that will support sustainable growth at the local level**
- **Align federal climate change investments and activities to Indigenous and coastal community levels to improve decision making and adaptation, and to support reconciliation**

Enabling Sustainable and Prosperous blue economy sectors today and in the future

> We can't keep repeating the same approach if we want to get different results.

> Maximize the value of industries that already exist in the ocean space.

> We should be proud to be an ocean country.

> The Blue Economy Strategy should demonstrate early benefits.

> All departments must work together... and not put the onus on [us] to put the pieces together from each...

Canada's blue economy has real potential to generate new opportunities for sustainable growth and prosperity by taking strategic actions to address the barriers and challenges identified by participants in our engagement activities. We also have an opportunity to "build back better" post-pandemic to include more Canadians in our blue economy sectors and the benefits that these sectors generate; especially for Indigenous peoples and other under-represented groups.

In our engagement paper, we identified seven broad ocean sectors and the value that these sectors generate to local and regional communities, including employment, as well as their contribution to our national economy. We also posed five to eight questions for each sector, so we could gather information specific to their business and regulatory environment and understand any unique sector challenges and growth opportunities.

The majority of our roundtables were focused on one or more of these sectors and almost 50 per cent of written submissions were generated by industry participants or representatives. Our regional officials also held specific meetings with industry stakeholders.

This section of our report thus reflects what we heard from the Canadians who work in, on and around the water and the industry and community organizations that represent their interests. These blue economy sectors and industries include:

- Commercial Fisheries
- Aquaculture
- Processing
- Marine Transport
- Ports and Harbours
- Shipbuilding and Boatbuilding
- Coastal and Marine Tourism
- Ocean-based Energy
- Ocean Technology
- Future-oriented Ocean Sectors

What we heard ... broadly

There is consensus among the Canadians who participated in our engagement activities that ocean sectors and industries are enormously valuable to our coastal communities, our regions (including Indigenous and inland regions), and our nation as a whole. There is also agreement that the true value of our oceans is much more than employment and gross domestic product statistics.

> *Canada is an ocean nation. Not just because of our history, depth of experience, and unparalleled geographical advantages, but also because of our people and the commitment of Government to drive the blue economy forward for the benefit of all Canadians.*

To start, we heard very clearly that fisheries are of prime importance to Canada and Canadians and are ***the*** economic opportunity in many smaller coastal communities. For Indigenous peoples, access to fish for food, social and ceremonial purposes is part of their Constitutionally protected rights and access to fisheries is a key part of economic reconciliation. First Nations in the Maritimes and Gaspé region also have a Treaty right to fish in pursuit of a moderate livelihood and the five Nuu-chah-nulth First Nations in British Columbia have an Aboriginal right to harvest and sell fish. In addition, more than 130 Indigenous communities participate in communal-commercial fisheries—and many First Nations, Inuit and Métis peoples are also involved in other commercial fishing enterprises.

> *Fisheries reconciliation is crucial to closing the equity gaps between Inuit and all Canadians, to economic reconciliation, and to a more just society.*

Commercial fisheries are also incredibly important to non-Indigenous communities along our coasts and in other major waterways across Canada. For example, we heard about the critical importance of protecting independent owner–operators on all coasts to retain the wholesale, retail and extended value of fisheries to local supply chain companies and the families of fish harvesters. We also received a lot of input about how to enable intergenerational succession in fisheries by addressing the high cost of entry and supporting new entrants through policy changes.

> *If the owner is stripped out of the fishery, so is the community.*

During our engagement activities, other blue economy sectors stressed the importance of fisheries to local businesses. This includes coastal and marine tourism, the sport fishery and recreational fisheries, boatbuilding, ports and harbours, as well as fish and seafood processing.

Canada's aquaculture sector involves finfish, shellfish, and seaweeds and a range of farming methods. We heard differing views from participants in our engagement activities about the sustainability and social licence of some aquaculture practices. At the same time, we heard consistent support for shellfish and aquatic plant opportunities in aquaculture, including as a means of reconciliation with Indigenous peoples. Interest in seaweed farming and kelp conservation and restoration as nature-based solutions to climate change was also noted in a number of our roundtables, meetings and submissions.

> *We are ready to invest more but we need to know investments will be profitable and we will be able to grow...*

Overall, we heard that the fisheries and aquaculture sectors need a government 'champion' and regulatory certainty through the development of an aquaculture act, clear regulations and predictable decision making. We learned that lack of certainty in this sector has prevented recent investments in innovation and inhibited stability for its workforce. And yet, many aquaculture businesses are early adopters of advanced technologies and the industry produces less carbon compared to on-land farming. Moreover, aquaculture has higher youth employment and an excellent inclusion and diversity track record among its employees.

Commercial fisheries and aquaculture support Canada's fish and seafood processing sector. We heard that processing has opportunities to grow with market demand for value-added and ocean plant products, and the trend of using all parts of fish and seafood. But we also heard that the sector is facing persistent labour shortages. This has been well studied and the solutions shared with us are aligned with the Temporary Foreign Workers' Program and the immigration process.

> *Quality …will be a marketing tool that Canada could use to not only promote sustainable fisheries but the stewardship of ocean protection and management.*

In terms of sustainability, we heard that processing needs to continue to reduce its carbon footprint to align with the objectives of the blue economy. To that end, participants in our engagement activities called for continued investment in modern, reliable and resilient processing infrastructure, including in the Arctic.

Participants also identified a need to build on programs initiated under the Oceans Protection Plan. This $1.5-billion initiative enabled programs to help protect our whale populations from ship strikes and noise pollution, and to involve Indigenous peoples in the monitoring of marine vessel traffic and emergency response. We heard that these activities will be important for the future of marine transport in Canada and in the Arctic Ocean should marine waters become more navigable and shipping lanes established.

> *Build on the Oceans Protection Plan model—we've been recognized with that.*

Marine transport is a crucial link to the Great Lakes and the St. Lawrence Seaway, and many inland communities in Canada. It also plays a central role in connecting the blue economy to manufacturing: the largest business sector in the country. We learned about the many ways in which the marine transport sector has been working to 'green' its operations, including testing alternative fuels and equipping vessels with carbon reduction technologies. Industry, government researchers, and innovators are also collaborating to advance autonomous surface ship technologies, artificial intelligence navigation, and digital initiatives.

> *Canada can be a world leader in marine transportation, with electrification as the answer.*

The marine transport sector made it clear that they need regulatory certainty now on alternative fuels and the use of advanced technologies, as well as regulatory agility and consistency with international developments, to ensure continued alignment with global requirements and to safeguard Canada's ongoing competitiveness.

Greening marine transport extends to Canada's ports and harbours. Part of the "build back better" ideas that we heard from participants is that investing in coastal and marine infrastructure to improve climate resiliency is an opportunity to introduce alternative fuel options and other clean technologies that will be needed to serve future vessels. We learned that several larger ports on our east and west coasts are already involved in carbon reduction and environmental programs.

> *Given port operations are often in close proximity to residential neighbourhoods and Indigenous communities, examining ways to use marine infrastructure to reflect the diverse needs of these communities is important.*

Our ports and harbours have growth opportunities with the rise of the expedition cruising market and projected growth of Canada's Pacific Gateway. We also heard that by addressing some of the harbour infrastructure deficits in the Arctic, we can enable more Inuit to participate in the blue economy and resolve some of the challenges faced by Sealift and tourism operators. For example, investing in small craft harbours and modular ports which enable communities to continue traditional, cultural and economic activities.

The shipbuilding and boatbuilding sectors are enablers of marine transport, commercial and recreational fisheries, aquaculture, and coastal and marine tourism. Their sustainable growth opportunities and sustainability needs are thus connected with those of other blue economy sectors. We heard that shipbuilders and boatbuilders need to be connected with innovators and investment programs so they can build and test the viability and safety of low-carbon, alternative vessels. We also heard that synergizing port and vessel technology advancements is critical to ensure support services are available to industries investing in upgrades and new purchases.

We heard that the National Shipbuilding Strategy is enabling long-term proactive contracts and revenues to a range of businesses along the supply chain. We also heard that boatbuilders want to benefit from federal fleet procurement opportunities, such as vessel-life extension projects. It was recommended that federal fleet procurement call-outs should include decarbonization and other sustainability objectives to spur innovation that supports ocean health.

> *There is still a gap between what the National Shipbuilding Strategy has fostered and generated, and what the Canadian shipbuilding industry needs to be successful in the export market.*

During the course of our engagements, we learned more about Canada's expertise in boatbuilding from pleasure craft to super yachts, as well as our expertise in marine servicing, and the importance of these sectors to the economies of coastal communities. Boatbuilding data is aggregated with other sectors, so decision making, training, tourism strategies and government programs are not always enabling opportunities for the sector. It was also recommended that we revisit the luxury tax announced in Budget 2021 because of its unintended impact on Canada's boatbuilders.

Boatbuilding and marine services are part of Canada's coastal and marine tourism sector as they offer a range of repair and transient services to visiting boaters from elsewhere in Canada and the U.S. We also heard that tourism along our east, west and northern coastlines support businesses of various sizes: from cruise and yachting industries, sport fishery and recreational boating to whale watching, kayaking and paddling, and marine trail wilderness hiking.

> *It would be great for tourism and the Canadian economy if the boats were Canadian-made… This would be a source of pride for both Canadians and Canadian boatbuilders.*

While tourism has been hit hard by COVID-19, many tourism stakeholders in our engagement sessions approached the development of the blue economy strategy with optimism. We learned about the growing opportunity of experiential tourism across Canada and how '**anchor attractions**' drive tourism to more coastal communities.

> *We're ready for tomorrow's customer.*

Indigenous peoples, women, and youth are all well-represented in coastal and marine tourism. This sector also has the sustainability advantage of pristine oceans and waterways, and vast undeveloped and underpopulated areas, compared to most countries. It was recommended that we accelerate actions to conserve and protect this natural environment and better leverage their value within the context of community economic development.

The energy needs of coastal communities in Atlantic Canada have been served in large part by Canada's offshore oil & gas sector. We heard differing views from participants in our engagement activities about the sustainability and social licence of this sector. At the same time, we learned about the many sustainable and innovative activities that the sector has been undertaking to improve its environmental performance and to prepare its current workforce as the sector transitions to renewable energy. This includes private-sector investment in the current sector.

> *As our world rightly become more climate conscious, participants in the offshore oil and gas industry have been striving to do their part.*

The offshore oil & gas sector told us that infrastructure is needed to fill data gaps in the offshore area, such as weather buoys and communications buoys. They also recommended that we invest in "oceans broadband" to encourage offshore accessibility options.

We heard about the growth potential of marine renewable energy and its capacity to sustainably power blue economy sectors and their supply chains in a number of roundtables. To achieve this potential, we heard that regulations need to be agile, predictable and consistent and that this requires collaboration among federal departments and agencies. We also heard that regulators need to be faster to approve licences and testing permits.

The marine renewables sector advised us to be clear about why energy is being produced, either to achieve net-zero targets or for export, especially when engaging and involving communities in discussions about whether projects

may proceed. It was also recommended that government should support marine renewable small- and medium-sized enterprises (SMEs) at all stages of research, development, demonstration and commercialization.

> *There must be clarity of purpose for marine renewable energy. Industry can't be built on a 10-megawatt project.*

We heard the same recommendation from the ocean technology sector: government participation in proof-of-concept testing and demonstration helps SMEs take new technology to investors through to commercialization. Access to capital through the innovation lifecycle, including government funding programs, is another way to support ocean technology SMEs. We heard that procurement processes can also be an enabler to the sector, but it requires changes appropriate with the pace of innovation and new technologies.

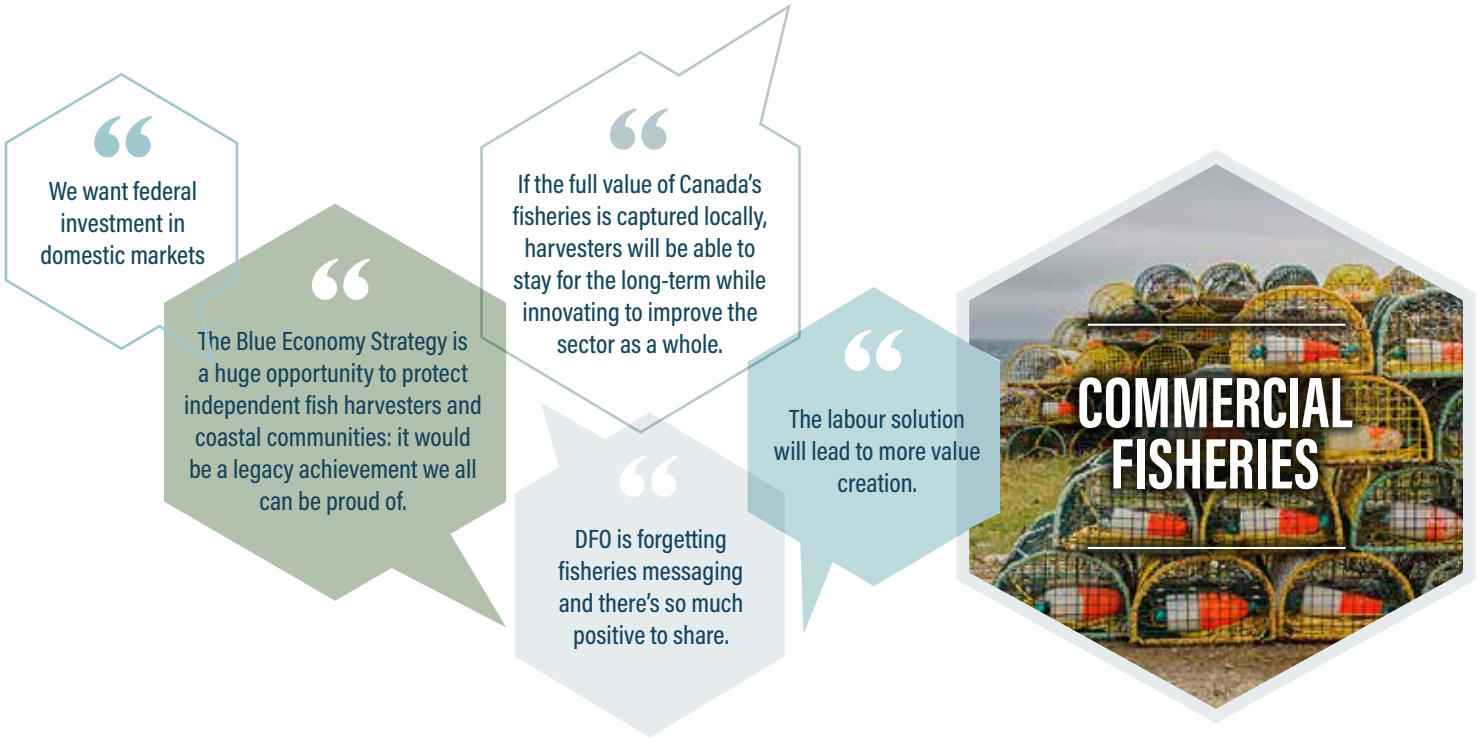
During our engagement activities, we learned that Canada's ocean technology sector has a highly skilled pool of talent and a number of leading-edge SMEs are serving domestic and international companies. This includes Indigenous-led ocean technology ventures. To position this sector for further growth, it was recommended that we connect these SMEs to other blue economy sectors so they can research and develop solutions collaboratively.

> *The whole aspect of exchange is big – like you're doing [with this engagement].*

Our blue economy engagement paper considered marine biotechnology as one potential ocean sector for the future. We heard that, combined with the principles of the **circular economy**, marine biotechnology has great potential for growth. We also heard that a number of companies, including technology start-ups, are developing circular economy micro-biology products and solutions. It was recommended that investments be made to expand on these developments, including in mainstream ocean sectors.

The conservation economy was another future-oriented ocean opportunity discussed during our engagement activities. This economy relies on stewardship and innovation (among other factors) and is built from collaborative integrated planning and partnerships. As such, it was recommended that we continue to invest in stewardship initiatives and innovation programs.

Overall, Canadians provided us with their views on the sustainable growth opportunities and sustainability advantages of our ocean sectors, and the actions that the blue economy strategy could take to enable these sectors to prosper. Specific input by sector is detailed below.



Participants in our engagement activities agreed that Canada's fisheries are the backbone of Indigenous and coastal communities and a main pillar of the blue economy strategy. We also heard that the long-term sustainability and success of commercial fisheries is wholly dependent on the health and abundance of wild fish stocks.

We heard that Indigenous peoples want more access to fisheries and that this access is key to closing socio-economic gaps and regional equity. It was also recommended that the blue economy strategy recognize and respect Indigenous and Treaty rights and support mixed economic opportunities in fisheries to help Indigenous communities meet local subsistence needs by providing access to both communal–commercial and commercial licences and quota.

At the same time, non-Indigenous fishery stakeholders raised questions about how reconciliation with Indigenous peoples may impact their livelihoods and future access to commercial fisheries. To that end, it was recommended that governments provide clarity on Indigenous rights and title. It was also recommended that DFO build its capacity to deal with harvester conflicts and be a bridge of communication between Indigenous and non-Indigenous commercial fish harvesters.

During the course of our engagement activities, we held roundtables with national, provincial, regional and Indigenous groups that are involved in commercial fisheries, along with individual fish harvesters. We heard in these sessions that there are sustainable growth opportunities. For example, the seafood sector has been a remarkable success story during COVID-19; demonstrating business resiliency and the ability to pivot to domestic markets. It was thus recommended that we support the retention and expansion of these markets, including through domestic marketing campaigns to increase seafood consumption by Canadians. It was also recommended that we encourage and support the commercial development of emerging fisheries, including kelp and seaweed fisheries, and the economic development of large-scale, small-scale, inshore and subsistence fisheries in remote, northern and Arctic communities.

We heard that commercial fisheries have many sustainability advantages, which position the sector well within the blue economy objective of healthy oceans. For example, these fisheries:

- Are managed using the precautionary approach to ensure harvesting decision making is hinged on the future sustainability of the resource
- Operate under strict regulations regarding monitoring and by-catch rules
- Together with aquaculture, contribute the least amount of carbon compared to other food system sectors
- Have access to traceability systems and internationally recognized sustainability certification programs

We also learned that Canadian innovation and sensor technologies have been developed to reduce waste in the seafood supply chain and there is interest in commercializing this innovation to advance the circular economy. In addition, we heard a number of industry-specific ideas to lessen the environmental footprint of the sector, such as developing environmental cleaners to prevent industrial ones from entering ocean waters and finding a sustainable replacement for the rubber bands holding lobster claws together.

To increase the sustainability of the commercial fisheries sector, we heard that governments should phase out fossil fuel subsidies to the fishing industry and support the transition of fishing vessels to clean fuel to achieve zero emissions by 2050. It was also recommended that we enable the development of more efficient and sustainable small vessel fish harvesting, processing and distribution operations, equipment and infrastructure on all coasts.

To position commercial fisheries for sustainable growth and prosperity overall, it was recommended that we:

- **Agree on and take action to further develop and communicate Canada's seafood strengths, such as the quality of our products**
- **Develop a five-year sustainable seafood development plan with measurable objectives**
- **Accelerate actions to recover and rebuild wild fish stocks, including through hatcheries**
- **Protect independent owner–operator fish harvesters to retain benefits in coastal communities**
- **Facilitate intergenerational succession as part of labour force renewal**
- **Facilitate access to capital and address issues related to the high cost of entry to a fishery**
- **Fill socio-economic and fish stock data gaps to inform better decision making**
- **Involve fish harvesters in data collection, science and decision making**
- **Foster sector predictability in terms of access**
- **Invest in infrastructure, such as small craft harbours, processing plants, and live storage tanks**
- **Ensure enterprise access to government funding programs**
- **Continue to help industry adopt new technologies**
- **Mandate a federal industry champion for economic seafood sector growth**
- **Collaborate with other departments and agencies (and levels of government) to ensure consistent decision making**

> Bring more flexibility to the temporary foreign workers' program.

> Automation allows us to do things with products that we couldn't previously do.

> One of the main impediments to sustainable development... is lack of housing...

> Keep primary resources in Canada for third- and fourth-level production to add value..

Commercial fisheries and aquaculture operations in Canada support fish and seafood processing: a key part of the value chain and a significant employer in Indigenous and coastal communities. The production of kelp, seaweed and other ocean plants also supports processing enterprises.

We received a number of submissions from organizations that represent fish and seafood processing, governments, and commercial fisheries and aquaculture associations and businesses, outlining the key issues and opportunities for our processing sector. We also heard from participants in our roundtables about the importance of enabling the growth and prosperity of processing by including specific actions for the sector in the blue economy strategy.

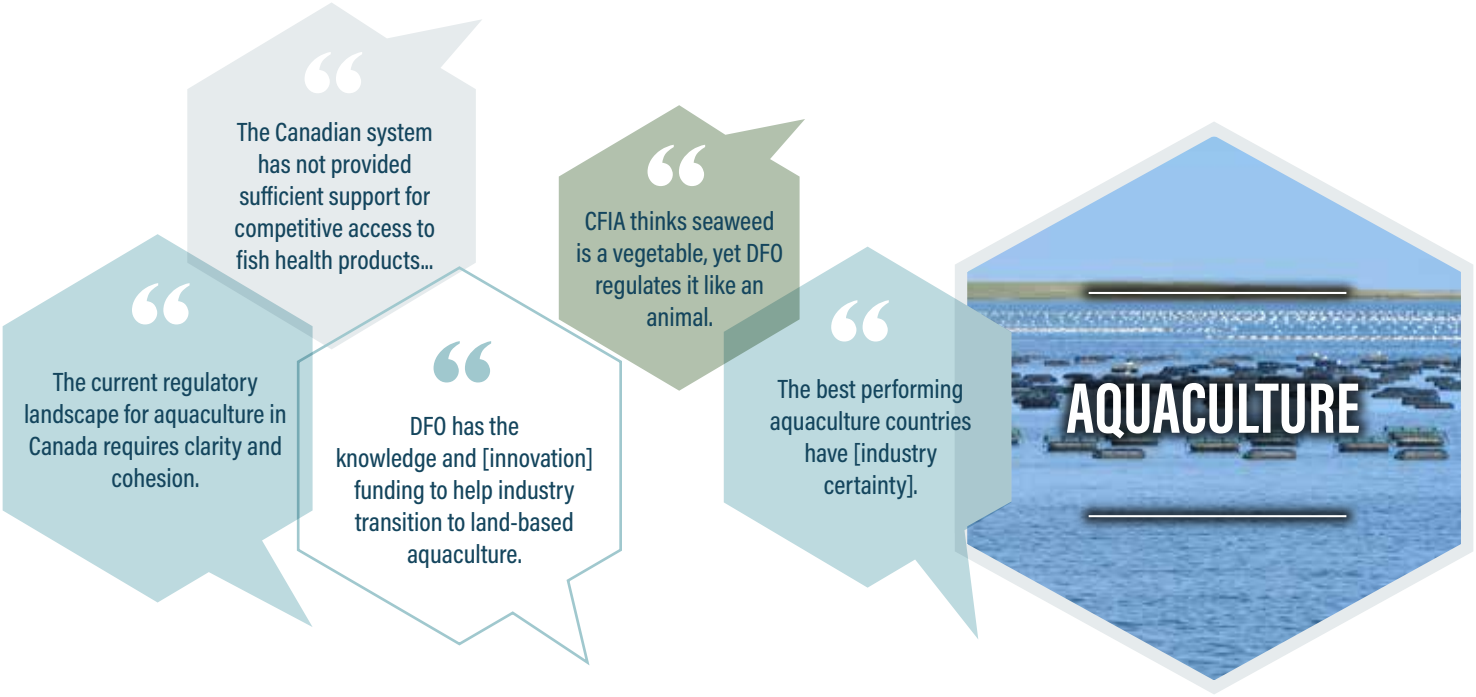
As explained in the labour force section above, the biggest challenge facing the processing sector at present is the labour shortage. We heard that human resources issues have been well studied and the recommended solutions in these reports need government actions to implement.

During our engagement activities, we heard that the sustainable growth opportunities for Canada's processing sector lie in value-added processing, including from seafood waste, and processing of new products, such as seaweed and products unique to Canada. We also heard that adding off-shore processing plants in Nunavut would ensure that the benefits of landed seafood remained within the territory. At the same time, differing views were put forward about the number of processing plants that should be in operation in other parts of Canada. For example, some support the re-establishment of facilities in coastal communities, while others think excessive plant capacity has led to shortened seasons for seasonal workers and the need for more income subsidies.

We heard that processing's sustainability advantage is the "Canada Brand," which is well recognized in export markets. But we also heard that processing is a huge consumer of carbon-produced energy, so to improve its sustainability, it must transition to green energy. It was also recommended that a coordinated trucking initiative should be undertaken to enable the sharing of delivery trucks to and from processing plants in order to reduce carbon emissions.

To position processing for sustainable growth and prosperity overall, it was recommended that we:

- **Maximize the "Canada Brand"**
- **Encourage collaboration and networking between innovators and sectors**
- **Invest in modern, reliable and resilient processing infrastructure and other ancillary services; especially, in the Arctic**
- **Ensure industry adoption of advanced technologies, including continued support of innovation funding**
- **Facilitate access to labour by actioning recommended solutions identified in this report**
- **Collaborate with other departments and agencies to address recommended Temporary Foreign Workers' Program and immigration improvements**
- **Enable diversification and value-added processing in Canada**
- **Invest in food hubs, product development, and retail development and expansion**



Canada's aquaculture sector sustains the growing of finfish, shellfish, and aquatic plants in ocean spaces, inland waterways, and on land, including in hatcheries. Canadians have differing views about net pen finfish farming and this was made clear by the range of input put forward during various roundtables, in written submissions, and in responses to our online survey. For example, we heard from some that this form of fish farming serves a critical role in the domestic and global food supply chain, while others believe it is inconsistent with the sustainable use of the ocean. We received conflicting recommendations, as well, from making efforts to correct public misperceptions of the industry to transitioning some industry activities out of Canadians waters.

We heard more consistent support from participants in our engagement activities for other forms of aquaculture; especially, the growing of various shellfish species and kelp/seaweed farming. We also heard about the efforts of the sector to develop and adapt to new technologies and innovation, such as new feed stock, to increase sustainability. In addition, we learned about the success of aquaculture in attracting youth, Indigenous peoples and other diverse and under-representative groups to its workforce. Moreover, we heard that 'done right' through partnerships, aquaculture can play a significant role in reconciliation. To that end, we heard from a number of Indigenous groups across Canada that they are interested in pursuing aquaculture economic development opportunities aligned to their values.

During our roundtables with sector participants and representative organizations, and in written submissions, we heard about the sustainable growth opportunities in new species, such as sea urchin, sea cucumber, Pacific sablefish and kelp/seaweed. Aquaculture has also been part of the seafood success story during COVID-19 and was recognized as an essential service by federal and provincial governments in terms of food security and economic stability and recovery. It was thus recommended that we should support the economic development of new aquaculture species and promote the essential role of aquaculture in sustainable domestic and global food production—and the future economic prosperity of coastal communities.

We also heard that aquaculture has sustainability advantages, such as:

- Access to internationally recognized sustainability and best practices certification programs
- Active participation of industry leaders at international sustainability tables
- Strict operational regulations regarding animal health and water quality monitoring and the use of pesticides and antibiotics
- Advanced technology adoption, including automation, digitalization and traceability
- Together with commercial fisheries, contributing the least carbon compared to other food system sectors

To increase its sustainability, we heard that 'green licences' to allow industry to test new technology without using existing production for trials, would be beneficial.

To position for sustainable growth and prosperity, it was also recommended that we:

- **Agree on and take action to further develop Canada's seafood strengths**
- **Develop a five-year sustainable seafood development plan with measurable objectives**
- **Recognize the diversity of aquaculture across Canada**
- **Foster sector certainty and predictability through government recognition**
- **Collaborate with other departments and agencies (and levels of government) to ensure consistent decision making and streamlined regulations**
- **Expedite development of an aquaculture act**
- **Appoint a federal industry champion for economic seafood sector growth**
- **Recognize aquaculture as a valid user of small craft harbours**
- **Proactively support financing and capacity building for Indigenous-led operations**
- **Accelerate actions to conserve, protect, restore and rebuild marine ecosystems, including to protect aquaculture operations and species from the impacts of climate change**
- **Fill knowledge gaps regarding sustainable use of ocean spaces and new opportunities**
- **Fill policy and regulatory gaps for aquatic plant farming (e.g., seaweed, kelp, etc.)**
- **Quicker and more supportive policy development**
- **Continue to help industry adopt new technologies, including through research and development funding programs**

> The Inuit possess significant local knowledge of Arctic waters...[and the] impact on navigation of weather patterns and changes...

> Navigation ...has greatly changed over the years, with changing conditions and the introduction of new technologies.

> Marine shipping provides linkages to overseas markets for a vast array of goods we depend on every day.

> Marine transport in Canada is 'green' with less than 1% emissions, while other modes account for 25%.

The marine transport sector is the primary means by which the export of manufactured goods is delivered to and from foreign markets. It is also the key mode of passenger transportation to and from our island communities. For Nunavut communities and residents, the sealift is the most economical means to obtain an annual re-supply of goods and materials. In addition, marine transport connects the blue economy, oceans and other large waterways to inland sectors and communities, including Canada's largest urban centers.

During our engagement activities, we were often reminded about the importance of the Great Lakes and the St. Lawrence Seaway to the success of Canada's blue economy. We were also reminded about the key role that the Oceans Protection Plan has played in forming a foundation for the blue economy strategy to take measures to monitor marine vessel traffic, keep our marine mammals safe, and protect our oceans and coastlines, including in partnership with Indigenous and coastal communities across Canada.

A number of marine transport stakeholders participated in our roundtables, including tables devoted to transportation, tourism, the Great Lakes region, the Arctic economy, youth in the blue economy, and labour force demands. We also received a number of written submissions from shipping companies, coastal pilot and seafarer's associations and unions, and other sector organizations. During these engagement activities, we learned about the labour force challenges facing the marine transport sector and some proposed solutions. This input is captured earlier in our report.

We also heard that the sector has key opportunities for growth, including in the Arctic region if their marine waters become more navigable and shipping lanes are established. There may also be technology-based opportunities. For example, we learned that a Canadian company has developed a transformative 'air traffic of ships' spatial system to track ships around the world, in real time, which would provide maritime decision-making intelligence to the global market.

Marine transport has many sustainability advantages and the sector is driving innovations that align it to the healthy ocean principles of the blue economy. For example, we learned that Canada has known carbon-reduction technologies and alternatives to bunker fuel. The largest alternative fuel test ever conducted is by a Canadian shipping company, while three large ferry operators have incorporated LNG-powered and electric hybrid vessels to their fleet. Other decarbonized fuel options are being considered and, to reduce pollutant emissions, some companies are using exhaust gas scrubbers. Ship owners are also working to protect marine mammals by reducing speed and altering routes in critical whale habitats, regularly collecting important data for scientists, and helping test new technologies, such as the early-warning whale alert system.

Marine transport has the Green Marine environmental certification program which is based on 14 performance indicators, has an accredited external verifier, and publishes results. The National Research Council of Canada has also been working with marine transport, ports and shipbuilding stakeholders to create Canada's first digital seaway from the Atlantic Ocean to the Great Lakes. This initiative aims to incorporate innovative technologies, such as Maritime Autonomous Surface Ship (MASS) technologies, intelligent sensors and data fusion, artificial intelligence navigation in ice and harsh environments, decreased underwater noise, and more.

To increase its sustainability, we heard that government should support current and future sector efforts to develop and adopt clean fuel alternatives and ensure regulations do not lead to alternative energy grid-lock. It was recommended that we should invest in a framework similar to in-land transportation to incentivize innovation and support more research and development in marine sector clean technology.

To position marine transport for sustainable growth and prosperity overall, it was also recommended that we:

- **Build on Oceans Protection Plan initiatives, such as investigating how different marine mammal detection tools could work together**
- **Simplify the *Canada Shipping Act* and regulations so they respond faster to innovations, such as autonomous vessels, and do not prevent industry adoption of biodiesel fuels**
- **Accelerate the *Canada Shipping Act* reciprocal system to help industry access foreign captains and mariners with credentials**
- **Prioritize development of regulations to manage marine transportation in the Arctic**
- **Collaborate with other departments and agencies (and internationally) to share data, reduce regulatory burdens and ensure consistent decision making and regulations**
- **Support new and existing collaborations between government, innovators and the sector to find solutions to issues, such as appropriate ballast water treatment systems, and involve mariners in data collection, science and decision making**
- **Align with international trends in decarbonization, alternative fuels and propulsion, and other green marine technologies**
- **Support the International Maritime Organization's Decarbonization Fund**
- **Continue to invest in the marine safety system**
- **Ensure sector access to government infrastructure programs**
- **Continue to build climate resiliency by renewing and repurposing the Transportation Assets Risk Assessment program**
- **Reform Canada's pilotage system to lower its costs, streamline operations, and prevent pilotage authorities from hiring navigators trained by industry**
- **Streamline and base the Pilotage Risk Management Methodology process on science**

> Incentivizing green ships to call at Canadian ports would …contribute to the long-term sustainability of Canada's trade routes…

> Small craft harbours are the front door to ocean economies and community networks.

> Seaports operate at the interface of ocean and land transportation.

> Ports in smaller coastal areas play a more significant role on smaller populations than large ports do on larger communities.

Ports and harbours are essential enablers of marine transport, commercial fisheries, aquaculture, marine servicing industries, and coastal and marine tourism, including the cruise industry. Terminal operators ensure Canada's import and export cargoes are handled efficiently, safely and in an environmentally responsible manner. Port infrastructure, including terminal containers, are the connection point to land-based manufacturing and resource industries and businesses.

During our engagement activities, we heard that modern, reliable and resilient port infrastructure is key to continue to support blue economy sectors. This includes investments to help both larger and smaller ports and harbours better withstand the impacts of climate change, including rising sea levels and storm surges. It was also recommended that investments in both small craft harbours and deep-water ports, as well as secure storage, be made to address the infrastructure deficits in the Arctic and northern communities across Inuit Nunangat.

We learned that ports and harbours work in close collaboration with Indigenous and coastal communities across Canada to ensure that they benefit from the activities taking place in their locales. For example, we heard that some ports have revenue-sharing agreements with Indigenous communities, have procured Indigenous business services in high value contracts, and are employing a high percentage of Indigenous people in port-related businesses. The Montréal Port Authority's Contrecœur Port Terminal Expansion Project consultation process was also noted as a best practice example of Indigenous inclusion.

We also heard that there are a number of growth opportunities for our ports and harbours. For example, 70 niche ports across Atlantic Canada are preparing to welcome new customers from the expedition cruising market, while ports and marine terminals in British Columbia are preparing to meet the projected growth of Canada's Pacific Gateway.

Over the course of our engagement activities, we learned that a number of our ports and harbours have sustainability advantages. For example:

The Port of Vancouver port is collaborating with several American states to undertake the Northwest Ports Clean Air Strategy and it is incentivizing shipping companies with 47 per cent off harbour dues if they take voluntary measures to reduce their environmental impact through its EcoAction Program.

The Prince Rupert Port Authority has developed a Carbon Emissions Reduction Strategy to reduce port emission intensity by 30 per cent by 2030 and become carbon neutral by 2050.

The Halifax Port Authority is collaborating with other transportation industries to establish a sector-focused Living Lab called PIER (Port Innovation, Engagement & Research) involving transportation, supply chain and logistics. The lab will be a place for industry, researchers and public partners to tackle problems together that no one party can solve on their own.

While ports and harbours are leading many sustainability changes, they recommended that government support their efforts to further green operations. For example, by offering incentives to install charging stations and battery banks to serve hybrid and electric vessels.

To position ports and harbours, as well as container terminals, for sustainable growth and prosperity overall, it was also recommended that we:

- **Consider 'rebranding' small craft harbours to better reflect the level of business and to recognize all users so the program is better planned and implemented**
- **Ensure the port divestiture program and 'ports on the periphery' can support necessary climate change risk assessments and resiliency upgrades**
- **Reflect stakeholder input to the Ports Modernization Review within the blue economy strategy**
- **Improve accountability and transparency of Port Authority decision-making, clarify roles and responsibilities and provide a mechanism for appeal of decisions**
- **Coordinate across departments and agencies to review and streamline port policies, governance, mandate, transparency, and regulatory environment**
- **Work with other levels of government to further enable shared access and multi-purpose ports, harbours and related marine infrastructure, including cost-share upgrade opportunities**
- **Upgrade key ports and harbours so they can receive ships and larger cruise vessels**
- **Incentivize ports to invest in innovation and 'green' technologies, such as a 'green' ships program**
- **Prioritize renewable energy projects with ports and coastal communities to support transition to clean energy, including in alignment with Canada's Hydrogen Strategy**
- **Continue to invest in the National Trade Corridors Fund to enable immediate and long-term port modernization in support of Canadian trade and competitiveness**
- **Allocate portions of the Low-carbon Economy Fund and/or Green Infrastructure Fund to support marine terminal operators**
- **Establish a data bank of research studies to enable more efficient regulatory processes, encourage more private sector investment, and more development of innovative solutions**
- **Develop export trade strategies that focus on utilizing ports and marine transport**
- **Collaborate with ports to initiate research and pilot programs to expand sustainable operations within the supply chain industry and support**
- **Encourage more collaboration and networking between innovators and sectors, as well as living lab initiatives such as PIER**

SHIPBUILDING AND BOATBUILDING

> We need international customers to reduce the local competition.

> We're part of a 25-year program that is renewing Canada's fleet...this charges aspirations and goals.

> Demand exceeds production capacity so greatly for companies building small fishing vessels that some book sales 3-5 years in the future.

> The luxury tax on boats... would disproportionately affect boat builders and dealers in Atlantic Canada and British Columbia.

There is consensus that the National Shipbuilding Strategy is serving to establish a sustainable industrial base on which to revitalize Canada's federal fleet and the shipbuilding sector overall. We also heard that the strategy has enabled long-term proactive contracts and revenues to a range of businesses along the supply chain which has enabled their growth. This includes businesses owned by women, Indigenous peoples, and other under-represented groups in the blue economy.

During our roundtables and through written submissions, we learned more about Canada's expertise in boatbuilding ranging from pleasure craft to commercial fishing boats to ferries. We also learned about vessel ancillary services, including repair services, boat sales, marinas, and marine engine manufacturers.

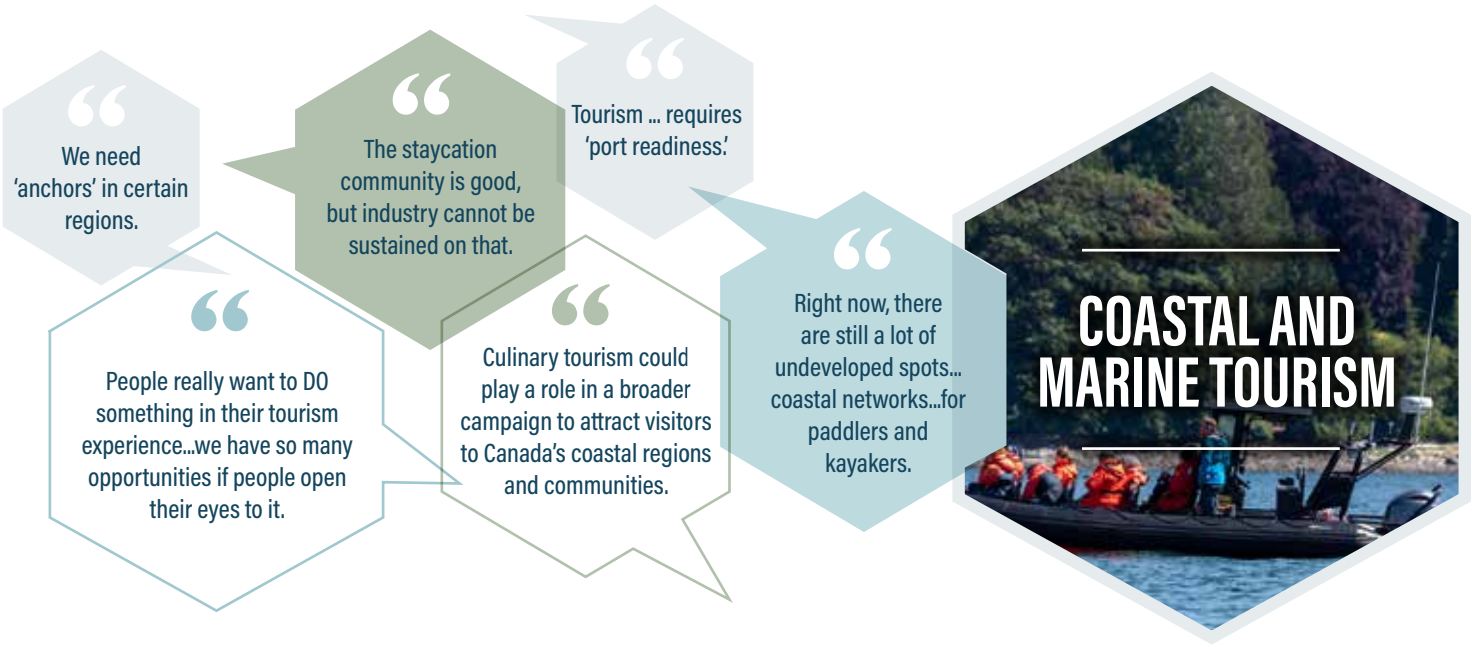
Combined, the shipbuilding and boatbuilding sector are enablers of marine transport, commercial and recreational fisheries, aquaculture, and coastal and marine tourism. The sustainable growth opportunities for this sector are therefore connected with the growth opportunities of other blue economy sectors. This includes increasing the employment and business opportunities for people living in coastal communities, who are more often employed in boatbuilding and ancillary services.

We also heard that there are industry-specific sustainable growth opportunities. For example, we heard that there are opportunities to expand the National Shipbuilding Strategy to boatbuilders so they can take on vessel-life extension projects for the Canadian Coast Guard and other federal fleet owners, and tap into the international market. For boatbuilding and marine services, we heard that there are opportunities to expand the range of service offerings to transient boaters.

The shipbuilding and boatbuilding sector has the sustainability advantage of building long-lasting and durable vessels and vessel components. To increase the sustainability of ships and other vessels built in Canada, it was recommended that we explore niche expertise in designing and building vessels with carbon-neutral operation, in collaboration with a range of vessel users as well as with harbours and ports, to ensure access to alternative power sources on the local grid.

To position the shipbuilding, boatbuilding and marine servicing sector for sustainable growth and prosperity overall, it was also recommended that we:

- **Connect other blue economy sectors with shipbuilders and boatbuilders, as well as innovators, to build and test the viability and safety of low-carbon, alternative fuel vessels and invest throughout the innovation lifecycle**
- **Enable collaborations and networking across ocean sectors to leverage best practices and prevent siloed approaches to multi-sector issues, such as labour shortages**
- **Invest in modern, reliable and resilient infrastructure, including 'green' infrastructure**
- **Continue to help ocean sectors adopt clean technologies**
- **Ensure enterprise-wide access to government innovation funding programs**
- **Develop more agile regulations to keep up with innovation and new technologies**
- **Invest in vessel-life extension projects and the shipbuilding sector by expanding the National Shipbuilding Strategy to boatbuilders**
- **Improve federal procurement processes to be accessible to SMEs and to align decarbonization and other sustainability objectives within federal call-ups for vessels**
- **Enable initiatives to attract transiting vessels, such as through Canada's Tourism Strategy**
- **Collect and analyze primary data on boatbuilding to inform decision-making and training standards**
- **Replicate and/or build on the *Pathways to Shipbuilding Programs* to continue to increase the number of under-represented groups in the sector**
- **Retain domestic sales of pleasure craft that have resulted during COVID-19**
- **Revisit the luxury tax based on its socio-economic impact on recreational boatbuilders**
- **Invest in end-of-use vessel disposal programs**
- **Work through international trade to lift tariffs on materials needed by ship- and boatbuilders, and to address protectionist legislation preventing Canadian vessel builders from competing for U.S. contracts**



Canada's coastal and marine tourism sector encompasses a wide range of businesses of various sizes: from the cruise industry, sport fishery, and recreational boating to whale watching, kayaking and paddling, and marine trail wilderness hiking. The sector is notable for its greater inclusion of Indigenous peoples, women, and youth compared to many other blue economy sectors.

Tourism of all kinds has been hit hard by COVID-19 with travel restrictions ending, and since curbing, international and inter-regional domestic visitors to our coastal communities. While many tourism stakeholders in our engagement sessions approached the development of the blue economy strategy with optimism, they reminded us that it was difficult to plan ahead when many businesses are operating in 'survival mode.' In addition, at the time of our engagements, tourist operators were still waiting for the Canada-U.S. borders to reopen and many port cities were being by-passed by U.S. cruise vessels.

We held three roundtables on coastal and marine tourism in different regions, and sector representatives participated in many other roundtables. We also received written submissions from cruise and recreational boating associations, governments at provincial, territorial, municipal and Indigenous levels, and others with ideas to sustainably advance tourism through the blue economy strategy. This includes identifying sustainable growth opportunities.

For example, we learned that experiential tourism is very popular as visitors want to be connected to the place and the people during their trip. This may mean participating in fishing with a guide or experienced fish harvester before eating the catch, learning about the culture of a First Nation or Inuit community while on a marine trail or on a boat, or viewing marine mammals while learning about marine protected areas. To capitalize on this opportunity, it was recommended that government departments and agencies, such as DFO and the Canadian Food Inspection Agency, work together to establish or align regulations for experiential tourism. It was also recommended that 'anchor attractions' for tourists should be planned for more coastal communities, based on the successes of communities with ocean observation decks and whale sanctuaries. In addition, it was recommended that provincial, territorial and national tourism organizations be supported to help Indigenous communities develop experiential and eco-tourism businesses, if this is part of the community's economic plans.

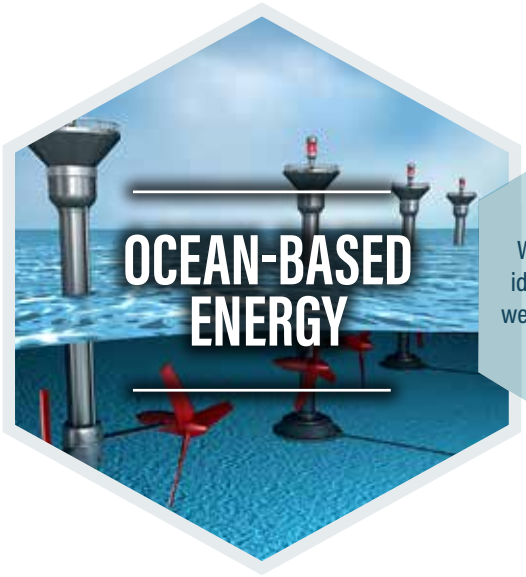
> *An 'anchor attraction' is a feature tourist venue, activity or sightseeing spot that forms the basis for a broader tourism economy and revenues in a select area or community.*

We learned that the coastal and marine tourism sector has the sustainability advantage of Canada's pristine oceans and waterways, and vastly undeveloped and underpopulated areas compared to most countries. This advantage is connected to other sustainable growth opportunities in expedition cruises and visits from U.S. recreational boaters, but we need to facilitate travel to these areas versus concentrating mainly on urban areas and their outskirts. We also heard that recreational boaters have been voluntarily adopting cleaner fuels and are willing to look at boat recycling and alternative fuel programs.

To increase the sustainability of the sector, it was recommended that we accelerate actions to conserve and protect marine ecosystems, recover and rebuild wild fish stocks (including through hatcheries), and protect whale populations and other aquatic resources. It was also recommended that the value of continued access to coastlines and wild areas be taken into account when considering development. For example, we heard that new approaches to community and economic development may be needed to protect historical, cultural and natural areas.

To position coastal and marine tourism for sustainable growth and prosperity overall, it was recommended that we:

- **Determine what makes Canada special and unique to grow tourism as part of efforts to brand Canada's ocean assets**
- **Support the cruise industry's strategic plan**
- **Invest in infrastructure, including ports, harbours, Internet connectivity and 'anchor' attractions**
- **Collaborate with other departments and agencies (and levels of government) to develop up-to-date policies and regulations for tourism to ensure the safety of tourists**
- **Ensure ocean legislation and policies, as well as marine spatial planning, include tourism**
- **Support ACOA-Sector Council pilot projects to train fish harvesters to become tourist operators in the off-season**
- **Align boatbuilding and marine servicing to the tourism sector to explore how 'made-in-Canada' vessels could be part of the tourist business and experience**
- **Invest in tourism opportunities to showcase cultural and Indigenous heritage**
- **Consider the impacts of fisheries decision making on tourist-related activities**
- **Enable access to more coastline clean-up funding opportunities**
- **Continue overall collaboration and communications across marine and coastal tourism**
- **Improve access to financing and options for income generation**
- **Encourage collaboration and networking between blue economy sectors to enhance tourism experiences and offerings**



> We need the genesis of ideas now to ensure that we have the fuel cells we'll need by 2050.

> For every direct job in Newfoundland and Labrador in the oil and gas industry, 1.8 jobs are created in Canada.

> There must be clarity of purpose…energy production or decarbonization.

> DFO and NRCan must work together.

> Tidal energy could be net positive or, at the very least, very low environmental impact.

Ocean-based energy includes the offshore oil & gas sector and the marine renewable sector. Marine renewable energy, in turn, includes tidal, wave, current, and wind industries.

Canada's offshore oil & gas sector helps communities meet their energy needs, while contributing to local economies and employment in Newfoundland and Labrador and Nova Scotia. This includes more than $3.3 billion in contracts with Indigenous-owned businesses. We also heard that the sector supports sustainable development values and continually invests in improving its environmental performance. This includes investing in the establishment of the Clean Resources Innovation Network to ensure Canada's energy resources can be sustainably developed and integrated into the global energy supply. We also heard that Canadians have differing views about offshore oil & gas. For example, some believe that this activity is inconsistent with sustainable use of the ocean and recommend that we implement a 'just transition' by 2030.

During our roundtables with sector participants, representative organizations, innovators and demonstration facilities, as well as in written submissions, we heard that the oil & gas sector has sustainable growth opportunities to develop in the Arctic and other harsh environments. We also learned that the sector has a number of sustainability advantages to reduce its carbon emissions and the impacts of its operations on marine ecosystems, such as:

- Research, development and demonstration through the Emissions Reduction Fund
- Engagement and approval requirement under the *Impact Assessment Act*
- Collaboratively developed Environmental Effects Monitoring plans, none of which have shown adverse impacts over the past 25 years
- Digital Offshore project that is working to develop world-class digitalization capabilities
- Environmental Studies Research Fund, which provides invaluable scientific data to all oceans sector participants
- ecoNEXT research to establish a pathway to net-zero

To increase the sustainability of Canada's offshore oil & gas sector, it was recommended that we should support digitalization by investing in infrastructure and enabling data accessibility and by exploring the establishment of a national test bed for clean ocean technology, such as remote and autonomous operations.

During the course of our engagement activities, we learned that Canada's marine renewable energy resources are largely untapped and offer immense sustainable development potential. For example, we heard that these resources could play a significant role in helping Canada achieve net-zero by 2050 by generating clean electricity

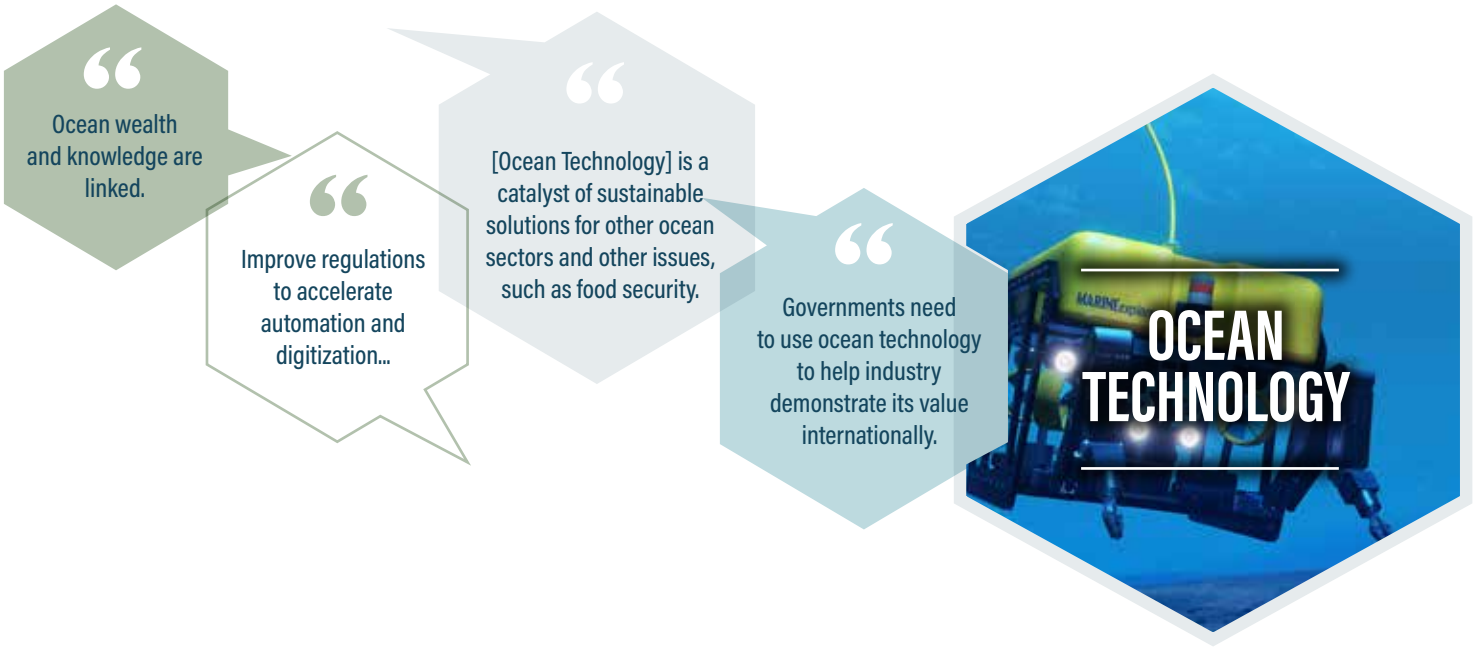
and supporting the net-zero objectives of other ocean sectors. In fact, participants in our engagement activities told us that marine renewable energy is the 'nexus' of the blue economy in terms of its capacity to sustainably power blue economy sectors.

At present, Canada's marine renewable sector is largely focused on tidal energy with demonstration facilities in Nova Scotia and the highest tides in Nunavik and the Bay of Fundy. We heard that turbine generator technologies are also being used to get remote communities off diesel fuel in some areas. We also heard that offshore wind energy offers further sustainable growth potential in Canada as many other countries have expanded this industry over the past decade and there are synergies between offshore wind and tidal energy development. In addition, we heard that offshore wind development in the U.S. has spurred economic opportunities for Canadian suppliers.

To grow sustainably, we learned that the marine renewable sector has some knowledge gaps to fill and it requires certainty in terms of government regulations. We also learned that the sector needs clarity of purpose with respect to its development; namely, either to meet domestic energy needs or for export.

To position all ocean-based energy industries for sustainable growth and prosperity overall, it was also recommended that we:

- **Establish modern, agile, predictable and consistent energy regulations to enable and advance environmental sustainability and inclusion**
- **Collaborate with other departments and agencies (and levels of government) to ensure consistent and transparent decision making and streamlined regulations**
- **Enable sector certainty through consistent decision making and regulations to help the sector attract global capital investors**
- **Facilitate marine renewable energy opportunities via increased regulatory clarity**
- **Significantly reduce the time it takes to review offshore oil & gas exploration licences**
- **Align the blue economy strategy to Canada's Hydrogen Strategy**
- **Fill data, information and knowledge gaps by investing in offshore infrastructure, such as weather buoys, as well as in science, data collection and data analysis**
- **Invest in "oceans broadband" to encourage deployment of offshore accessibility options**
- **Demonstrate government support for marine renewable enterprises at all stages of research, development, demonstration and commercialization**
- **Encourage collaboration and networking between innovators and sectors**
- **Require engagement of communities and other ocean users, as well as consultation of Indigenous communities, at all project stages to help sectors get a social licence to proceed**
- **Be clear about why energy is being produced: to achieve net-zero commitments or for export**
- **Incentivize companies to participate in research and development through new funding mechanisms to de-risk private sector investments**
- **Work through international trade to lift the duties placed on the use of Specialized World Asset Vessels which diminishes Canada's competitiveness, and to address aspects of the *Coastal Trading Act* that are of concern to the sector**
- **Allow offshore oil & gas development projects to qualify for the Atlantic Investment Tax Credit, even on a short-term basis**
- **Clarify the impact of Article 82 of the United Nations Convention on the Law of the Sea**
- **Review the interpretation of the *Canada–Newfoundland and Labrador Atlantic Accord Act* to allow more timely release of physical environmental information in studies**



Canada's ocean technology sector is building a competitive advantage for other blue economy sectors as the catalyst to sustainable, efficient and cost-effective practices and operations. For example, during one of our roundtables, we heard that the recent Impact Canada–ACOA Hull Efficiency Design Challenge served to re-imagine a vessel's hull design and construction, as well as propulsion, to improve fishing vessels.

We also learned during our engagement activities that Canada's ocean technology sector has a highly skilled pool of talent in research and development, innovation and science, as well as a number of leading-edge small- and medium-sized enterprises that are delivering technologies and services to domestic and international companies. In addition, we learned that ocean technology has been an outstanding success during COVID-19 as it has continued to grow throughout the pandemic.

We held a number of roundtables on ocean technology and ocean innovation, and participants in other sessions included ocean technology business owners, councils and organizations. There is consensus among these participants that technological advances will continue to play a critical role in helping ocean sectors remain sustainable **and** prosperous.

We also heard that Indigenous-led ocean technology ventures are expected to increase the participation of Indigenous peoples in the blue economy. For example, we learned that *SednaLink* plans to build a 2,000-kilometer fiber optic network between Iqaluit and Newfoundland and Labrador by November 2022, and to extend the network to Qikiqtani communities in Phase II and Kivalliq communities in Phase III. The network will use science, monitoring and reliable telecommunication (SMART) cables with spurs to collect marine intelligence and environmental monitoring in real time for salinity, water pressure, temperatures, and currents. This venture will create long-term employment for Inuit as it will require annual maintenance and research.

While we heard much about Canada's expertise in ocean technology, we also heard that governments and industry in Canada could be more frequent users of this technology.

To position ocean technology for sustainable growth and prosperity, it was recommended that we:

- **Support start-ups, scale-ups and SMEs throughout the research and development lifecycle**
- **Ensure enterprise access to government funding programs and procurement processes**
- **Improve procurement processes to align with the pace of innovation and technologies**
- **Permit unsolicited proposals to be put forward to government purchasers**
- **Increase government programs that support ocean technology at commercialization stages**
- **Encourage collaboration and networking between ocean technology SMEs and sectors**
- **Enable made-in-Canada solutions for remote environments and autonomy**
- **Bring together technology, genomics and aquaculture to achieve food security**
- **Establish modern and agile regulations to enable innovation and advanced technologies**

We are at a pivotal time in which innovation and emerging technologies could help us deal with and solve environmental challenges, while introducing new ocean sectors. As described above, some ocean sectors are already incorporating new technologies, such as automation, artificial intelligence and digitization, to gain a sustainability advantage.

Our blue economy engagement paper considered marine biotechnology as one potential future-oriented ocean sector. 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.

We heard that marine biotechnology combined with the principles of the circular economy has great potential for growth in producing a wide variety of products. The circular economy keeps resources and products in use for as long as possible and uses waste to prevent negative impacts from occurring, including by regenerating natural systems. We heard that a number of companies, including technology start-ups, are developing circular economy micro-biology products and solutions. For example, we heard there is an opportunity to produce marine natural products from micro- and macro-algae for diverse applications, building on success in the fish health and nutrition industries. It was recommended that investments be made to expand on these developments, including in mainstream ocean sectors.

> *The World Economic Forum defines the circular economy as "an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models.*

The conservation economy was another future-oriented ocean opportunity that we heard about during many of our engagement activities. While, once again, there is no standard definition, in general, the conservation economy generates employment and economic wealth from the monitoring and protection activities required to keep oceans and coastlines healthy in order to sustain industry and other human uses.

In short, it is an economy that enables other sectors to take place in the ocean over the long term. It was thus recommended that we should continue to invest in stewardship initiatives and innovation programs to advance conservation economy initiatives.

Canada's Blue Economy Leadership

Canada is a global leader when it comes to ocean conservation and protection. We want to extend this leadership in the development of our blue economy.

Throughout our engagement activities, we asked Canadians for their ideas on how we could demonstrate international leadership.

In response, we heard that Canada could:

- **Build a whole industry on monitoring and addressing climate change**
- **Expand our leadership in ocean observing systems and networks**
- **Develop concrete, science-based solutions to effectively managing ship–whale interactions**
- **Lead in feeding the world sustainable seafood**
- **Be a leader in ocean plant cultivation and blue carbon**
- **Lead by integrating the unique knowledge of Indigenous peoples in decision making**
- **Promote ocean literacy**
- **Improve data on overfishing and illegal, unreported and unregulated fishing**
- **Lead on electrification of marine transport vessels**
- **Use structured processes when working with regional fisheries management organizations**
- **Lead multilateral international efforts to address illegal, unreported and unregulated fishing and ocean plastics**
- **Resolve systemic inequities for Indigenous peoples and other under-represented groups**
- **Help build the ocean management capacity of developing and smaller states**
- **Be a leader in the blue circular economy**

What's Next?

Meaningful engagement is imperative for the development of a blue economy strategy. Despite COVID-19, we were able to have important discussions with many Canadians about the blue economy, the environment, and the sectors that our oceans support.

We want to thank everyone who took the time to participate in a roundtable, submit a submission or respond to our online survey. Your input is invaluable in helping guide us as we develop a blue economy strategy.

Canada's Blue Economy Strategy, once released, will be available at **canada.ca/blue-economy**.

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