Clean Futures Plan 2022

– An Update on Progress

BCFerries

Message from the CEO

Jill Sharland, BC Ferries' Interim President & Chief Executive Officer

At BC Ferries, our mission is to connect communities and customers to the people and places important in their lives. Climate change is a global problem and we recognize that it is the greatest challenge of our generation. BC Ferries believes that responsible businesses need to contribute to efforts to address climate change. We are committed to support British Columbia to meet its greenhouse gas (GHG) emissions reduction target for the transportation sector of at least 27% less GHG emissions compared to 2008 levels by 2030.

The 2022 Clean Futures Plan builds on the momentum created in the inaugural 2019 publication and provides an update on our roadmap to a cleaner future. BC Ferries' approach to evaluating our options to reduce GHG emissions from our operations is in balance with our commitment to maintain a safe, reliable and efficient ferry system for our customers. We will invest in initiatives to reduce GHG emissions that have passed our rigorous evaluation of risk, cost and environmental benefits. We also continue to monitor climate actions taken by other operators and recognize that there is not a one-size-fits-all solution to reducing GHG emissions for our operations. We see our path to a cleaner future that is based on a carefully chosen multifaceted and adaptable approach.

BC Ferries has identified five areas of action that we believe will be key in our approach to reducing GHG emissions. We are motivated to evaluate these options for the best fit and value for both short and medium to long-term applications.

Renewable and Alternate Fuels: We will seek among available energy sources the cleanest, lowest carbon-intensity options that can displace our reliance on fossil fuel. Successful trials with biodiesel and renewable diesel in 2022 have demonstrated it is possible to significantly reduce the carbon intensity of our operations with greener fuels. We plan to expand the use of these two fuels and aim to consider renewable natural gas for our existing six natural gas operated vessels and future fleet. We will remain open to all possibilities in the future including other alternate fuels such as green methanol, hydrogen and ammonia. Two of the key challenges are affordability and availability, something we will work hard to overcome.

Electrification: Electrification can play a vital part in reducing GHG emissions in ferry operations. The recent acquisition of six battery electric hybrid vessels brings us one-step closer to having all-electric ferries. There are physical, technological and financial challenges with installing the needed infrastructure to charge a fully electric vessel and we will seek solutions to overcome these barriers. The extensive approach of plugging in our vessels to electric shore power, along with our focus to electrify our vehicles contributes towards achieving our emissions reduction targets.

Operational Efficiencies: Our fleet and engineering operations teams tirelessly work together to find ways to operate our vessels as efficiently as possible. Utilizing effective route planning, consistent and efficient speeds and diligent use of extra engine power when required. Close collaboration with our terminal operations team enable efficient turnaround to minimize schedule disruptions and conserve energy consumption.

Advanced Technologies: We are continuously seeking innovation to reduce energy consumption and minimize our emissions, including collaborating with governmental agencies and industry experts. Simple upgrades include converting lighting systems to energy saving fixtures, investing in more efficient hull coatings, and cleaning underwater hulls, while more complex initiatives include installing variable frequency drive on Coastal Class propulsion motors and retrofitting Spirit Class vessels with emissions reduction kits. We are also considering auto-mooring systems for the future. There is often a financial payback from these projects making these innovations all the more attractive.

Fleet Modernization: Our New Major Vessel program to replace six legacy vessels operating on our major routes is currently in the design phase and proposes to put the first vessel into service in 2029. The design will aim for simplified automation, efficient operations and a reduction of at least 75% of the baseline route emissions per nautical mile during normal operations. These new vessels will be at the heart of our emission reductions initiatives for the future.

BC Ferries foresees many exciting opportunities and a range of options to achieve our objectives. Our strategy reflects a balance between striving for the highest level of safety, reliability, and fare affordability to earn the trust of our passengers, while striving to gradually achieve ambitious GHG emissions reduction targets. There are many unanswered questions and we want to be transparent as we carefully structure our pathway to bring sustainability and cleaner operations to our coastal ferry system.

Jill Sharland

BC Ferries' Interim President & Chief Executive Officer

MV Spirit of British Columbia

Our Commitment

At BC Ferries, we are focused on reducing the GHG emissions our operations produce, while being responsible for operating one of the largest ferry systems in the world. We are striving to meet British Columbia's 2030 GHG emissions reduction target for the transportation sector. Whereas British Columbia's baseline year is calendar 2007, BC Ferries baseline year is Fiscal 2008 to better present a more accurate picture of our operations. BC Ferries is committed to reduceing our GHG emissions by at least 27% below 2008 level by 2030.

BC Ferries commits to reducing its GHG emissions by at least **27%** below 2008 levels by 2030.

Governments and organizations, including British Columbia, Canada, and the International Maritime Organization (IMO) established targets to combat climate change.

The IMO is a specialized agency of the United Nations, which is responsible for measures to improve the safety and security of international shipping and to prevent pollution from ships. The table below shows how BC Ferries has aligned its 2030 target to support British Columbia's transportation sector target. At the same time, we continue to monitor and adapt to future GHG-related regulations that are likely for domestic shipping.

We are seeing governments and businesses pledge to reach net zero by 2050. To us, net zero means that any GHG emissions are offset by equivalent amounts of GHG removals from the atmosphere. The biggest problem is not the ambition to be net zero, but the answer to the question of how we will get there. To achieve net zero, governments will have to invest heavily in infrastructure before 2050 to facilitate businesses to reliably secure access to low carbon energies such as hydroelectricity. Vessel operators will have to innovate and develop new technical solutions, including dramatically new vessel designs and options to address their existing fleets reliance on fossil fuels. BC Ferries' policy is to comply with all applicable regulations, and our approach is to continuously monitor and evaluate feasible GHG emissions reduction options and their ability to influence the pace of GHG emissions reduction, which in turn will influence the Company's future GHG emissions targets.

Organizations and their GHG Emissions Reduction Targets

	BC Ferries	British Columbia	Canada	International Maritime Organization
2005			baseline year (calendar)	
2007	baseline year (Fiscal 2008)	baseline year (calendar)		
2008				baseline year (calendar)
2025		16% below baseline		
2030	27% below baseline	40% below baseline Specific to the Transportation Sector: 27-32% below baseline	40-45% below baseline	40% CO_2 reduction (per transport work, as an average across international shipping)
2035			Will be set no later than December 1, 2024	
2040		60% below baseline	Will be set no later than December 1, 2029	
2045			Will be set no later than December 1, 2034	
2050		80% below baseline Commitment to Net Zero*	Net Zero	70% CO_2 reduction (per transport work) 50% GHG emissions below baseline

Note: Net Zero is not a BC legislated target.

Battery banks on board our six new battery hybrid electric Island Class ferries.

Our Progress

Since committing to measure our progress in the Clean Futures Plan (2019), BC Ferries has invested considerable efforts to inventory and understand our GHG emissions.

BC Ferries GHG Emissions Inventory

BC Ferries' GHG emissions inventory is an accounting of GHG emissions from both marine and land-based operations, every year back to 2008. The inventory is consistent with the principles of the internationally recognized *GHG Protocol Corporate Accounting and Reporting Standard* and is compliant with the Green Marine environmental certification program.

BC Ferries has established an **organizational** and **operational boundary** to determine which of our activities are included.

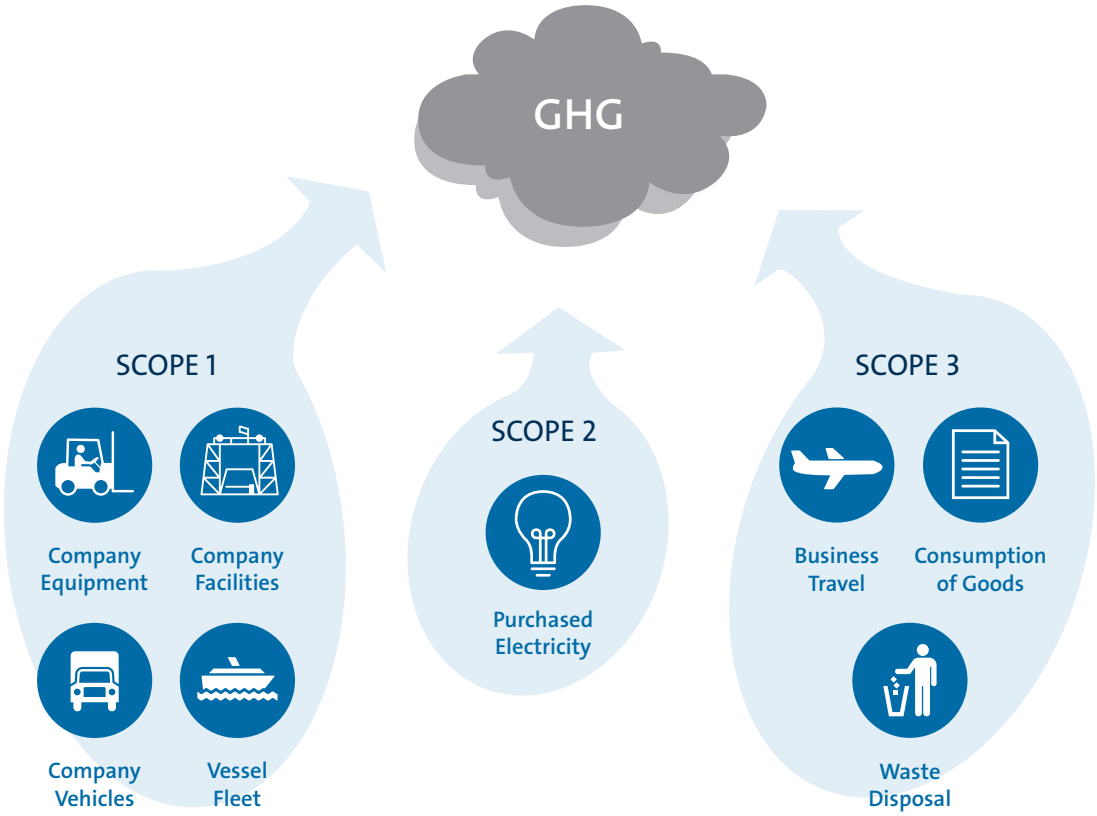
BC Ferries' organizational boundary includes activity under BC Ferries' operational control, including:

- Operation of the vessel fleet on regulated routes;
- Operation of terminals, offices, shipyard, and other BC Ferries' facilities; and
- Commercial Services operations.

Our operational boundary further breaks down these activities and their associated emissions into **direct** and **indirect** emissions. Direct emissions, or Scope 1, are those from sources controlled by us, while indirect emissions (Scope 2 and 3) are a consequence of our operations, but occur at sources elsewhere. Various activities across BC Ferries' 47 terminals, offices and other properties as well as the 26 regulated ferry routes are categorized this way.

What is Included in Our Inventory?

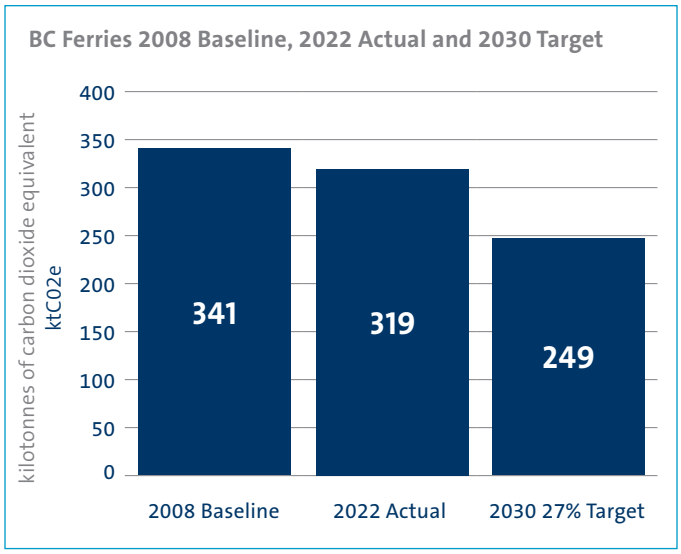
BC Ferries is committed to continually reviewing our emissions inventory to ensure that it is as relevant, complete, consistent, transparent, and as accurate as possible. This includes expanding our inventory boundaries and considering additional sources in the future.



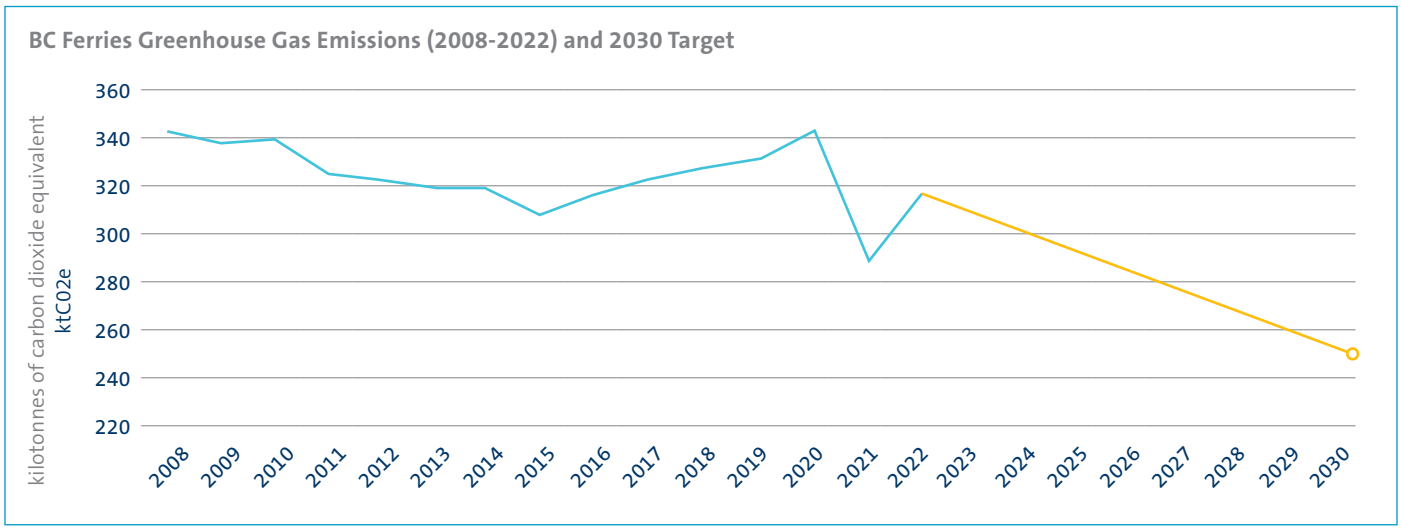
Our Baseline Year is 2008

To align with the Province, BC Ferries established a baseline year of fiscal 2008 to represent the initial level of GHG emissions for the Company against which all future emissions inventories are compared, future GHG reduction targets can be established, and future GHG emissions reduction efforts are measured against. In 2008, the Company emitted 341,000 tonnes of carbon dioxide equivalent (CO_2e) and had a fleet of 37 vessels exclusively using diesel, approximately 94% of all energy consumption by the Company was fossil fuel-based.

BC Ferries' commitment to reduce our GHG emissions by at least 27% below 2008 level by 2030 necessitates that the Company strives to emit no more than 249,000 tonnes of CO_2e in 2030 from the activities included in its GHG emissions inventory's operational and organizational boundaries.



BC Ferries GHG Emissions 2008 to 2022 and 2030 Target



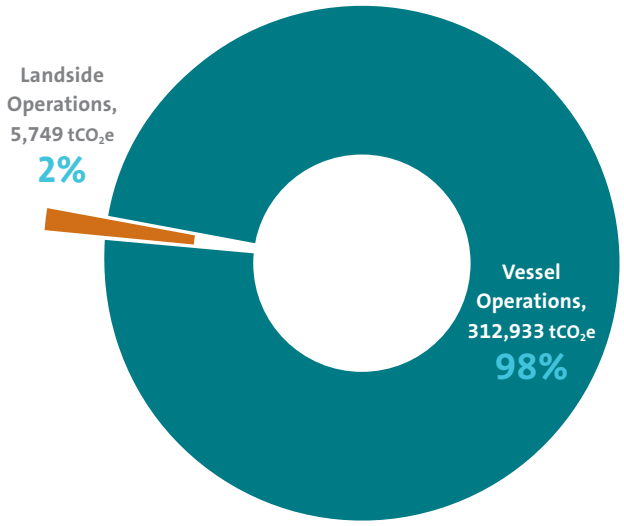
Key Findings from the 2008 to 2022 BC Ferries GHG Emissions Inventory

- Annual fluctuations in GHG emissions inventory are primarily driven by changes in service levels;
- In 2022, BC Ferries' GHG emissions totaled 319,000 tonnes of CO_2e;
- BC Ferries' GHG emissions in 2022 were 5% below 2008 baseline levels;
- Emissions increased from 2021 to 2022 by 10%. The driver for the increase was an increase in CO_2 emissions from diesel and liquefied natural gas combustion by vessels driven by a return to closer to normal number of sailings following the COVID-19 pandemic the previous year; and
- The COVID-19 pandemic and resulting limitations on travel temporarily decreased the Company's GHG emissions in 2021 to 291,000 tonnes of CO_2e. The year of 2021 was the lowest calculated emissions level for the Company between 2008 and 2022.

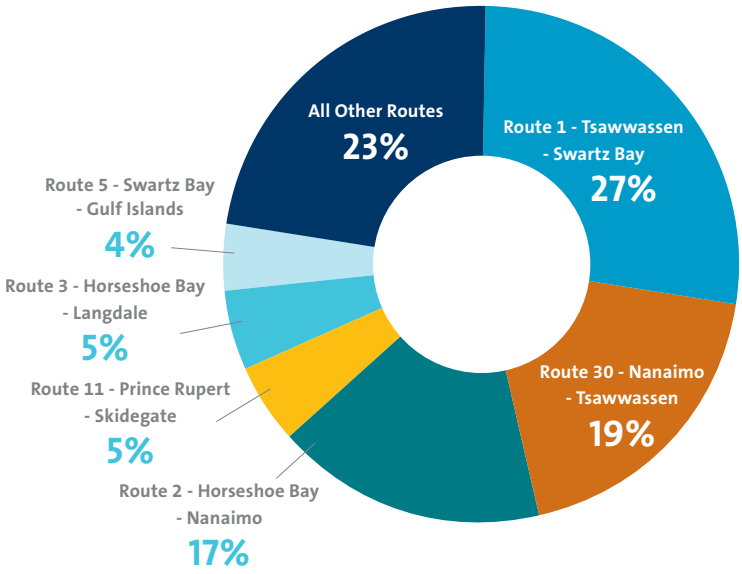
In any year since 2008, the typical breakdown of GHG emissions has 98% of Company emissions belonging to the combustion of fuels by vessels. Six regulated routes make up approximately 77% of all GHG emissions from vessel operations. Out of the six top emitting routes, several vessels on Routes 1, 2, 3 and 30* are proposed to be replaced with low emissions vessels starting service in 2030 as part of the New Major Vessels program.

**Route 1: Tsawwassen - Swartz Bay, Route 2: Horseshoe Bay - Departure Bay, Route 3, Horseshoe Bay - Langdale, Route 30: Tsawwassen - Duke Point.*

Company Emissions 2022 in tCO_2e

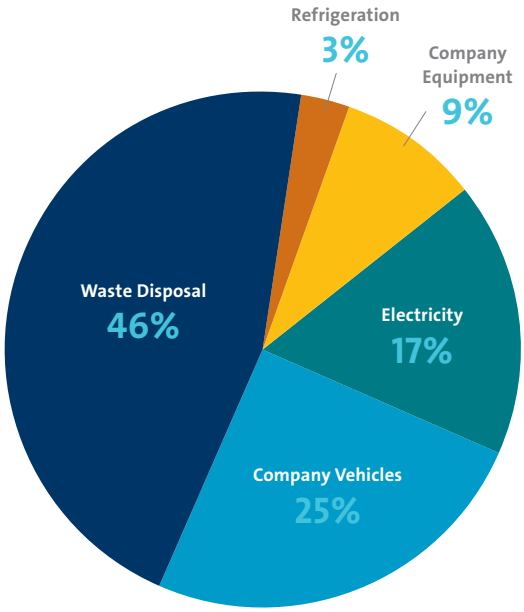


Top 6 Emitting Routes above 10,000 tCO_2e



Our corporate emissions inventory allows us to assess the GHG emissions output on a company-wide scale, marine vs land-side operations, and even to a site-specific level. Looking at one of our busier terminals, Tsawwassen, for the fiscal 2022 year, we can see the breakdown of GHG emissions per source. From garbage generated on site, to electricity consumed to power buildings and vessels via shore power, to fugitive emissions from refrigeration systems, we can quantify and monitor how individual activities affect the overall GHG emissions profile of our operations and use this information to focus efforts on emissions reduction.

Breakdown of GHG Emissions for Landside Operations - Tsawwassen Terminal 2022



Locations which Emit the Most Greenhouse Gases in 2022

Rank	Location	tCO_2e
1	Deas Pacific Marine Shipyard	742
2	Duke Point Terminal	615
3	Swartz Bay Terminal	501
4	Tsawwassen Terminal	498
5	Departure Bay Terminal	363

Evaluating Options

BC Ferries has five key areas of actions to reduce GHG emissions.

5 Areas of Action to Reduce Our GHG Emissions from Vessels

- **Using renewable and alternate fuels (such as renewable natural gas, renewable diesel and biodiesel);**
- **Electrification;**
- **Operational efficiencies;**
- **Advanced technologies; and**
- **Fleet modernization.**

We are actively evaluating opportunities in terms of reliability, safety, cost and GHG emissions reduction to inform our pathway to a cleaner future. Here are four examples of current evaluations we are undertaking in order to make informed decisions. These examples highlight the careful consideration that BC Ferries undertakes at each step to understand impacts and minimize risk.

Evaluating Reliability and Safety – a trial to increase biodiesel content

In October of 2021, BC Ferries began a trial to increase the biodiesel blend ratio of the ultra-low sulphur diesel used by its vessels from the current 5% to 20%. BC Ferries has been using an ultra-low sulphur diesel blend with 5% biodiesel in the majority of its vessels since 2010. The purpose of the trial was to demonstrate technical compatibility and mitigate for any operational crew impact prior to wider scale adoption. BC Ferries has the potential to reduce GHG emissions per litre of fuel consumed by approximately 14% by switching to 20% biodiesel from 5% biodiesel.

A successful trial was conducted on the *Queen of Oak Bay*, which operates between Departure Bay to Horseshoe Bay. This route was selected for the trial because of its consistent operating schedule and should reliability issues arise, the *Queen of Coquitlam* was available to provide relief. A technical risk assessment was conducted on fuel handling procedures, including bunkering and fuel use, following engagement with the vessel engine manufacturer. The *Queen of Oak Bay* successfully used both 10% and 15% biodiesel blend and will conclude its trial of 20% biodiesel blend in the fall of 2022. Preliminary results indicate reliability and safety can be maintained with a 20% biodiesel blend ratio on the *Queen of Oak Bay*. The ongoing trial and future trials on other vessels and routes will provide further information on which to base an informed decision to widely adopt a 20% biodiesel blend ratio.

Evaluating Fuel Security and Cost – actively pursuing supply of lower carbon intensity fuels

Increasing the use of renewable and alternate fuels with lower carbon intensities than our current fuels provides significant opportunity to reduce GHG emissions. BC Ferries is actively working with fuel suppliers to determine feasible approaches to adopt lower carbon intensity fuels, for both vessels in service and new vessels that will be built in the future.

Our team is monitoring the supply and cost of potential lower carbon intensity fuels to secure sufficient supply and to drive down cost. For example, BC Ferries' New Major Vessel program intends to design and build low emissions vessels, which would significantly reduce the Company's total GHG emissions. Recognizing the importance of safe and reliable service, this objective requires securing an uninterrupted and cost effective supply of a lower carbon intensity fuel in time for deployment and for the duration of the vessels' years of service.

We are keeping close watch on drop-in fuels, like renewable diesel and liquefied renewable natural gas. Drop-in fuels are preferred because they can be used in existing marine engines without major modifications to support immediate reductions in GHG emissions due to the fact they are chemically identical and share the same specifications as the conventional fuel they are replacing.

In the short term, renewable fuels such as renewable diesel and liquefied renewable natural gas and biodiesels are readily available for use. Where as, emerging low carbon intensity fuels such as hydrogen, ammonia, and methanol are more likely to be available for use in the medium to long term. The long-term sustainability of the supply of each fuel type as demands across multiple industries increases will also be considered.

Quantifying GHG Emissions Reduction Benefit – understanding the GHG emissions reduction benefit of electrification

As of 2022, BC Ferries owns and operates six diesel hybrid-electric Island Class ferries that are "electric ready" with the intent to convert them to 100% battery electric operation when shore-side charging infrastructure is available. Our GHG emissions analysis shows that this conversion could avoid up to 15,000 tonnes of CO_2e per year for the vessels operating on hydroelectricity rather than in the diesel hybrid-electric mode. However, significant external challenges currently preclude the operation of an all-electric vessel, and may require federal and/or provincial government support to help offset the high capital cost of shore-based infrastructure. BC Ferries remains committed to evaluating various route electrification opportunities with the intent to electrify routes that offer the greatest benefit from an emissions reduction and financial investment perspective.

Evaluating Cost – exploring the potential to generate and monetize carbon credits

To assist with financing potentially high operating expenses associated with renewable and alternate fuel adoptions, BC Ferries continues to evaluate our potential to generate and monetize carbon credits through provincial and federal programs. The Province implemented the BC Low Carbon Fuel Standard to reduce the carbon intensity of fuels and sets carbon intensity targets that decline each year. Fuel suppliers can generate carbon credits for supplying fuels with a carbon intensity below the targets and receive carbon debits for supplying fuels with a carbon intensity above the targets. As of 2021 and 2022, BC Ferries could qualify as a Part 3 fuel supplier for liquefied natural gas and electricity, respectively. BC Ferries is currently seeking approval from the Province to become a Part 3 fuel supplier for liquefied natural gas. Moving forward, we are carefully evaluating all options to be a Part 3 fuel supplier and possibly use the ability to monetize carbon credits to generate revenue to support future investment in renewable and alternate fuels and electrification.

Commitment to Continue Reporting Progress

BC Ferries is carefully monitoring efforts by the Province of British Columbia, Government of Canada and international bodies such as the IMO to combat climate change impacts from the transportation sector. We anticipate that these three areas of effort will influence our progress reports in the future.

- Regulators in the maritime industry are intensifying efforts to reduce greenhouse gas emissions from shipping. The IMO has a goal to achieve a reduction in carbon intensity of 40% by 2030 compared to 2008 levels. To that end, they have introduced mandatory operational and technical measures for international shipping: the Carbon Intensity Indicator (CII), Energy Efficiency Design Index (EEDI), and Energy Efficiency Existing Ship Index (EEXI). BC Ferries is following the conversation as Transport Canada works to implement similar measures for domestic Canadian vessels.
- BC Ferries is supportive of British Columbia's CleanBC plan to meet climate targets by 2030 and beyond. We have aligned our own emissions targets with the Province's transportation sector-specific target of a 27% reduction in GHG emissions by 2030. As part of legislated requirements, the Province will review all sector-based targets by 2025 and may expand the number of sectors included, adjust the targets or narrow the percentage ranges.
- Green Marine is the leading environmental certification program for North America's maritime industry. BC Ferries has been a participant of Green Marine since 2014. Within this voluntary program, we report our emissions footprint on an annual basis and provide updates on efforts to reduce GHG emissions and air pollutants from our operations. Our performance in this area and that of industry peers is disclosed publicly, keeping us accountable and motivated to improve.

We remain committed to supporting these efforts where we can and fulfilling all regulatory requirements pertaining to our industry.