



Clean Technology Adoption Plan

SUMMER 2018

 **BCFerries**

Message from the CEO

At BC Ferries, we have the privilege to operate in one of the most pristine environments in the world and it is our responsibility to protect the beauty that surrounds us. Reducing our environmental footprint through continued investment in leading-edge environmental stewardship is a top priority as we build a ferry system for the future.

BC Ferries already leads in North America when it comes to lowering emissions and adoption of clean marine technology. We were the first passenger ferry system in North America to adopt liquefied natural gas (LNG), pioneering “made in BC” technologies in the process. Notable are the four, soon to be five, LNG-fuelled vessels in our fleet (Salish Class and Spirit Class) that substantially outperform diesel vessels for emissions and costs.

We also have two Island Class 47-vehicle ferries under construction for our inter-island routes. These battery hybrid-electric vessels will utilize some of the most advanced clean marine technology in the world. When delivered in 2019, we believe these vessels will be the most efficient and quietest electric-hybrid ferries world-wide. They are just the latest in a series of milestones we have achieved as part of our Clean Technology Adoption Plan, our strategy to progressively lower emissions across the fleet and be a leader in the energy transition to a lower carbon future.

We know LNG is a fossil fuel and understand British Columbian’s desire to eventually eliminate this type of fuel altogether. However, adopting natural gas is important progress. It is far cleaner than diesel, domestically sourced and it supports Canadian jobs. Its use reduces fuel costs and foreign exchange risk significantly, contributing to more affordable ferry fares. It does not pollute water or marine life if spilled into water as it evaporates, and is not persistent in the marine environment as are oils. It can be reliably delivered by BC companies without significant new infrastructure or transport risk. LNG is a significant step toward sustainable transportation for coastal British Columbia.

In the past year or so, our vessels pioneered two “world firsts” in clean technology: the Salish Class were the first in the world to fuel LNG on the deck of a passenger ship, and the Spirit Class was first in the world to fuel LNG on a totally-enclosed deck. Both of these innovations were conceived by BC Ferries and designed, engineered and built by BC Ferries and its partners. These innovations saved BC Ferries users more than \$100 million in infrastructure costs and have unlocked significant environmental performance gains. We can be proud of the expertise we’ve developed and now share with other ferry operators.

Our Clean Technology Adoption Plan is leading us toward our next major vessel program. Four to six new large ships will featuring very large Energy Storage Systems (ESS), which will allow departure and arrival in port, as well as in-port operations, to be done electrically. Our goal is ultra-clean emissions with ultra-low fuel consumption.

Ferry users expect reliability, so we must also be realistic as we move along this path. There are real engineering and reliability issues that must be solved. There is also the significant matter of affordability. Without significant external funding, as is the case in parts of Europe, BC Ferries and our customers carry the cost of funding clean tech. That's why we are taking methodical and prudent steps as technology matures and costs stabilize.

At BC Ferries, we are ahead of the curve on clean technology adoption. Every day we study, engineer, invest and act. We are moving along a carefully structured path designed to protect coastal communities from unreasonable costs and unreliable technologies, while still bringing sustainability and cleaner operations to our coastal ferry system.

Mark Collins
BC Ferries' President & CEO



Clean Technology Adoption Plan

With a vision of being trusted and valued, the mission of BC Ferries is to connect communities and customers to the people and places important in their lives. We strive to be sustainable; our environmental, social and economic impacts are central to our business decisions.

Since 2004, we have been on a path to greater sustainability by being continuously active in developing and implementing innovative and cost-effective ways to minimize our impact on the coastal environment in which we operate.

Clean technology offers significant opportunities for advancing our sustainability objectives.

Our clean technology adoption plan focuses on two goals:



Carbon Reduction

BC Ferries is migrating operations to low-carbon energy sources while maximizing energy-consumption efficiencies.



Environmental Stewardship

BC Ferries strives to eliminate avoidable environmental contaminants and impacts at every step of operational activity.



Fuelling two Spirit class vessels with liquefied natural gas will reduce CO² emissions by 12,500 tonnes per year, which is the equivalent of taking 2,500 cars off the road every year. Each ship carries more than 2,000 passengers.

Carbon Reduction

Since 2003, BC Ferries has intensified efforts to reduce the carbon footprint of the ferry system. The Clean Technology Adoption Plan looks to every aspect of our vessel and terminal operations, now and into the future, and is a road map that is built with the interests of protecting the environment and the communities that we serve.

WHAT WE'VE DONE TO DATE

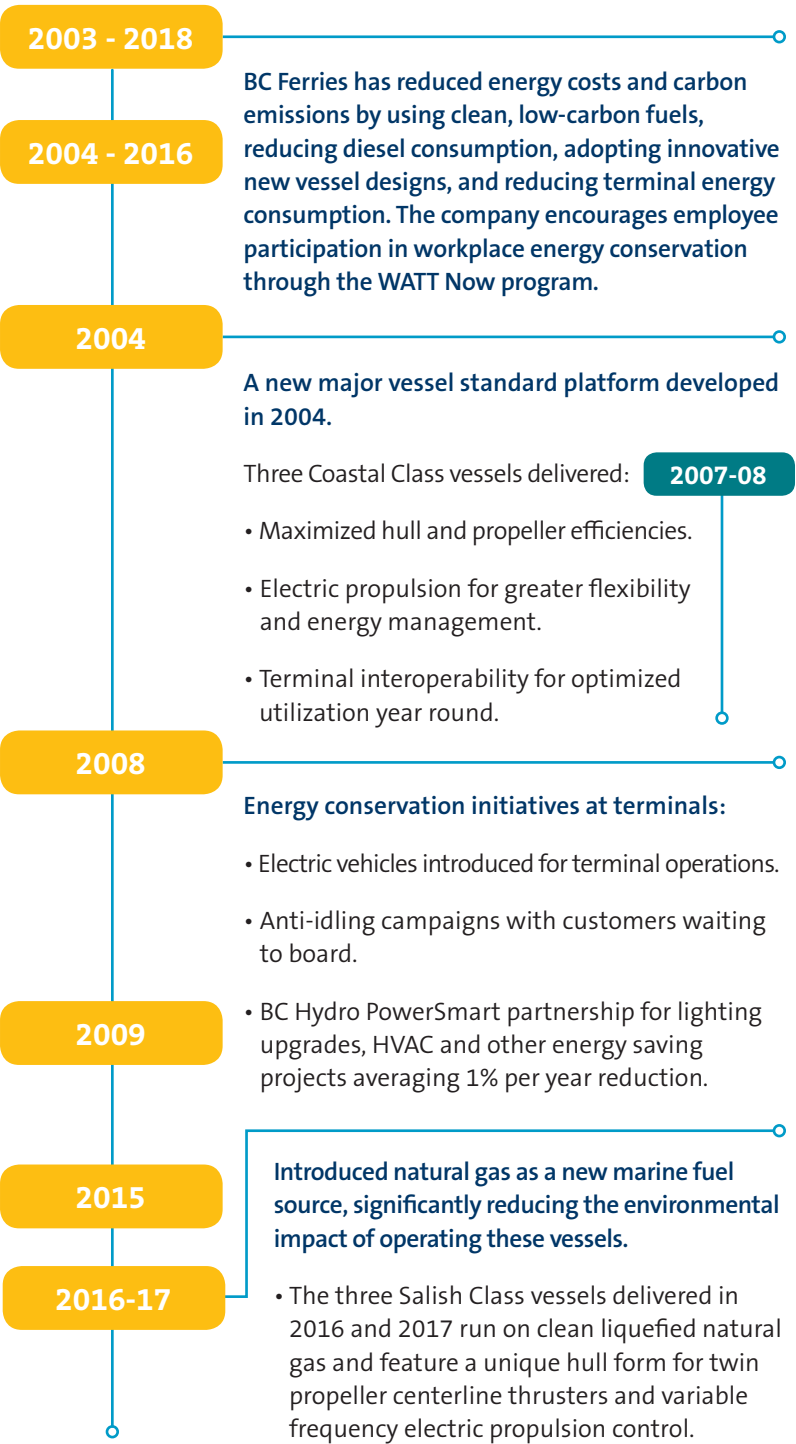
BC Ferries has invested in clean technologies.

6% reduction in fleet fuel consumption through:

- 2004-2016** • Engine upgrades and replacements.
- Optimizing vessel/route navigational path and speed parameters.
- 2008** • Locally developed programmable speed control technology fitted on eight major vessels to improve efficiency of each crossing.
- 2010** • *Kwuna*, *Tachek* and *Tenaka* hulls given low friction coatings to reduce drag and the necessary power required to move the vessel through water.
- 2013** • Battery hybrid auxiliary propulsion unit fitted to the *Tachek* for peak power saving.
- 2015-16** • Twelve shore power upgrades and installations to reduce ship generator run time when vessels are at terminals but not in operation.

Worked with BC-based diesel fuel suppliers to introduce a reduced carbon biodiesel blend for our marine engines.

Built the world's longest saltwater cable ferry between Buckley Bay and Denman West reducing fuel consumption on the route by more than 50%.



The introduction of the Baynes Sound Connector in 2015 reduced diesel consumption and associated air emissions on a single ferry route by more than 50%.

WHAT'S ON THE HORIZON?

Clean technology is at the core of our vessel and terminal renewal planning and is shown through our commitment to adopt:

Vessel design features for:

- Hull and propulsion systems that maximize energy efficiency.
- Shipboard power generation that can use alternative and renewable fuels.
- Hybrid arrangements with expanding battery capacity to displace diesel fuel and natural gas consumption.

An electrification strategy that factors for:

- Access to low carbon energy sources through the power utility network.
- Vessel homeporting near urban areas for access to mature utility networks.
- Enhanced electrification features in terminal development plans.
- Fully electric ferries when technologies permit.

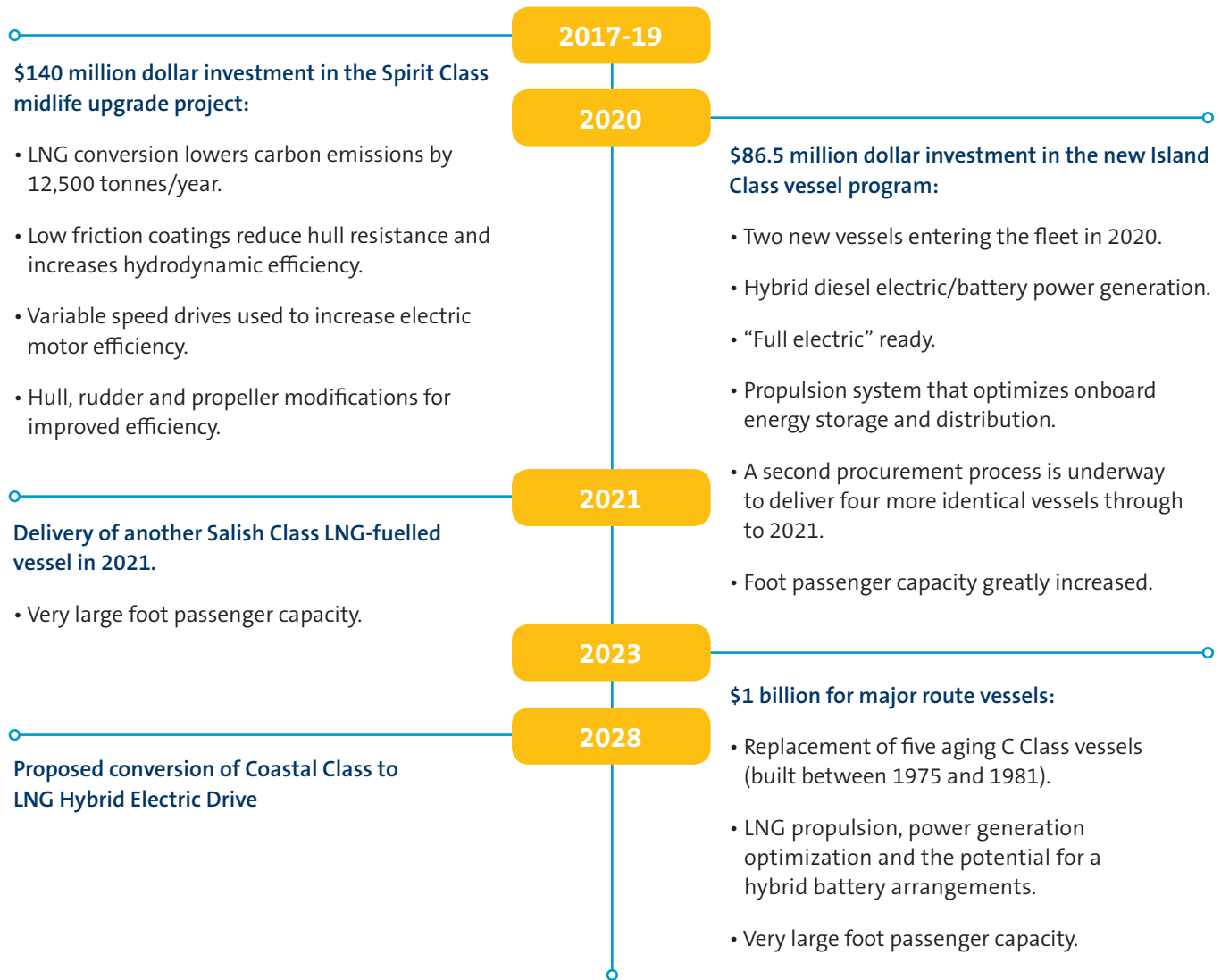
A fleetwide vessel class strategy that:

- Reduces the number of vessel variants from 17 to 5 classes.
- Enables clean technology adoption through standardization and system redundancy principles.
- Includes continuous engagement with internal and external stakeholders that covers the costs of implementing clean technologies and their impact on fare affordability.



Quadra Queen II

COMMITMENTS





Innovation in BC

Over the past 12 months, BC Ferries has pioneered two “made in BC” world firsts.

1. The new Salish Class vessels were the first in the world to fuel LNG on the deck of a passenger ship.
2. The *Spirit of British Columbia* was first passenger vessel in the world to fuel LNG on a totally-enclosed deck.

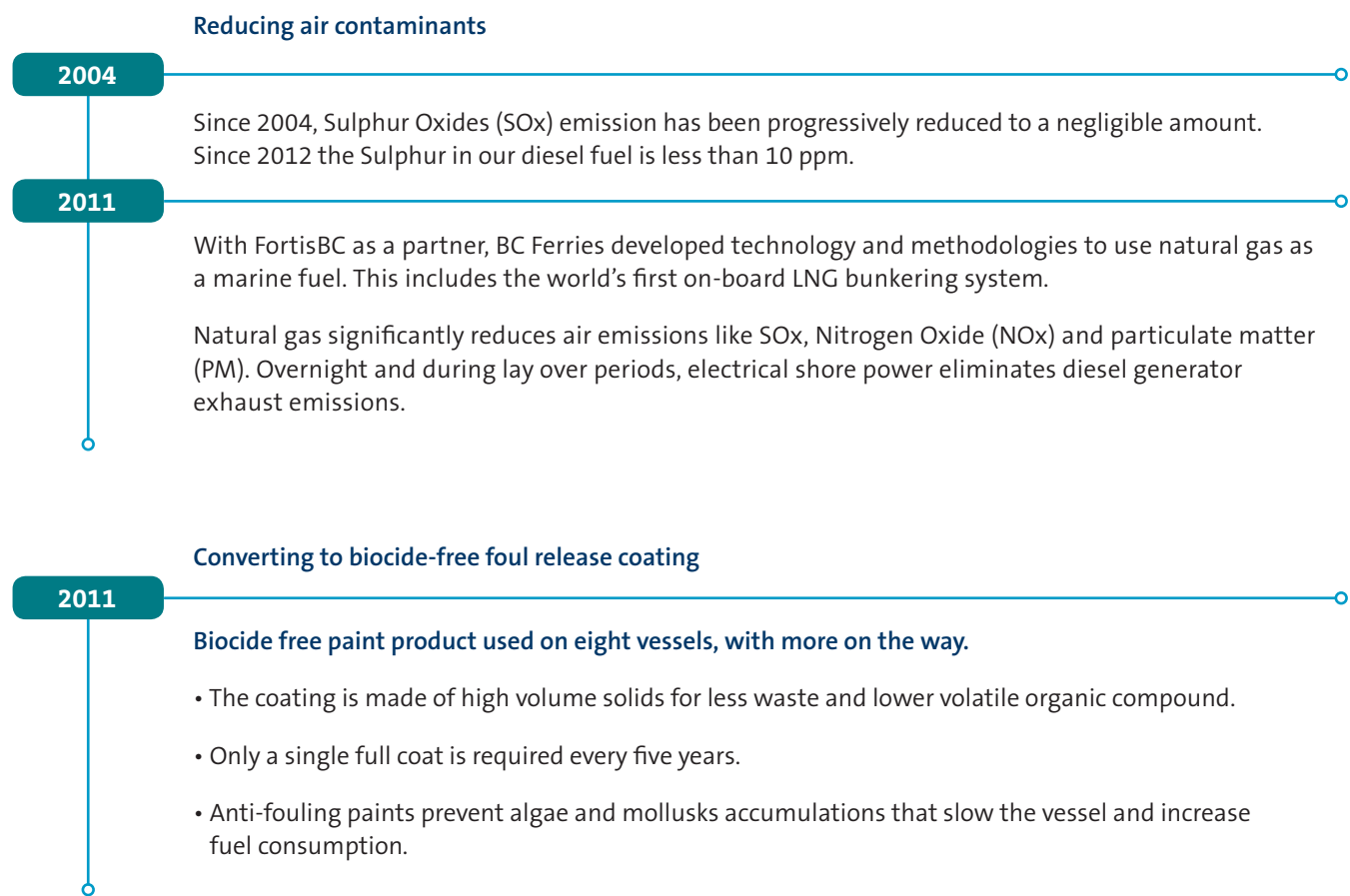
These innovations saved BC Ferries users more than \$100 million in infrastructure costs and have unlocked significant environmental performance gains.

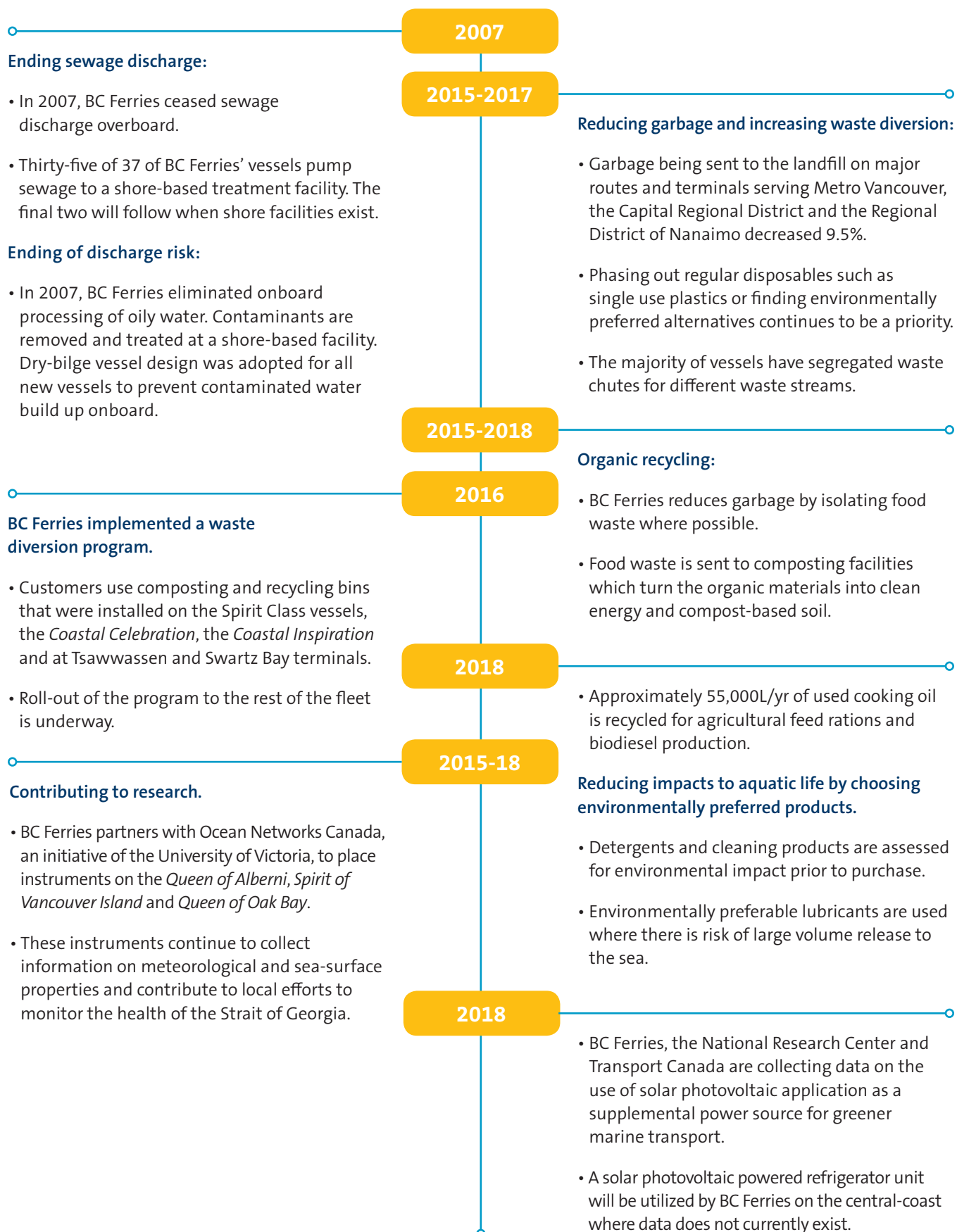
Environmental Stewardship

Environmental stewardship speaks to our responsibility to eliminate avoidable contaminants. It informs every aspect of our operations.

As one of the world’s most complex ferry systems, BC Ferries is a consumption and production intensive company with many inputs (e.g. assets) from purchasing, and outputs (e.g. byproducts, wastes and releases) from our operations. We are aware of the impact our choices have on the environment and we strive to continuously reduce the footprint of our operations.

WHAT WE’VE DONE TO DATE



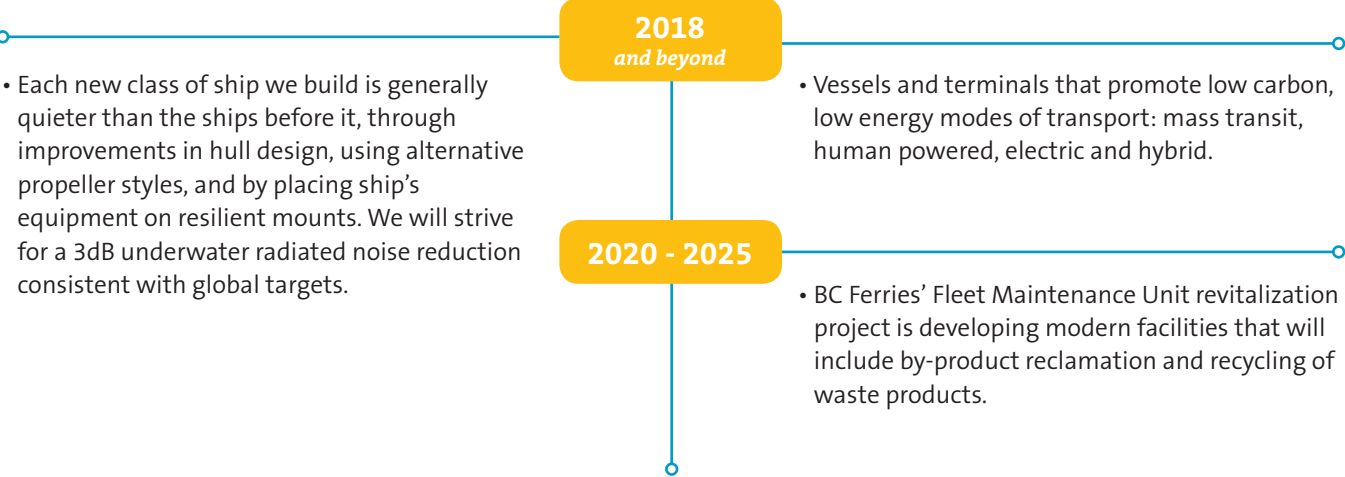


WHAT’S ON THE HORIZON?

BC Ferries’ 2018 Strategic Plan initiates leading-edge practices for environmental stewardship:

- Enabling every employee to perform their duties without generating or passing on uncontrolled contaminants.
- Quiet, low noise ships.
- Tracking and monitoring contaminant threats to air, water, and land-based ecosystems from procurement through use to disposal.
- Terminals developed and managed to be sustainable and efficient.
- Designing vessels, terminal and shore facilities to eliminate or control all uncontrolled contaminant sources.
- Zero emission electric ferries.

COMMITMENTS





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Baynes Sound Connector

