

# VANCOUVER MARITIME CENTRE FOR CLIMATE

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# THE IMPERATIVE

The maritime sector accounts for 3.6 million tonnes of CO<sub>2</sub>e per year in British Columbia<sup>1</sup>, 8.8 million tonnes of CO<sub>2</sub>e in Canada, and over 1 billion tonnes of CO<sub>2</sub> worldwide<sup>2</sup>, representing close to 3% of total annual emissions.

- **British Columbia**

- B.C. is committed through legislation to reductions of 40% by 2030, 60% by 2040, 80% by 2050 (compared to 2007 levels).
- The province has also established a reduction target specific to the transportation sector of reducing emissions by 27-32% by 2030 compared to a 2007 baseline.

- **Canada**

- Canada's Net Zero Emissions Accountability Act
- Canada Committed to an updated target under the Paris Agreement to reduce its GHG emissions by 40-45% below 2005 levels by 2030
- Canada signed Clydebank Declaration at COP27, a commitment to establish 6 Green Shipping Corridors- maritime based routes between port cities that support zero emissions shipping- by 2025.

- **Globally**

- International Maritime Organization (IMO) envisions reduction in CO<sub>2</sub> transport work, 40% by 2030, 70% by 2050 and a total annual GHG emissions from international shipping of 50% by 2050 (compared to 2008)



# GREEN SHIPPING CORRIDORS



WHO

24 countries, including Canada.



WHAT

Maritime Based routes between two or more ports that support zero-emissions technologies for ships.



WHEN

6 corridors by 2025



WHY

To enable faster coordination between fuel infrastructure and ships travelling between ports.



# GREEN SHIPPING CORRIDORS



# BC OPPORTUNITY

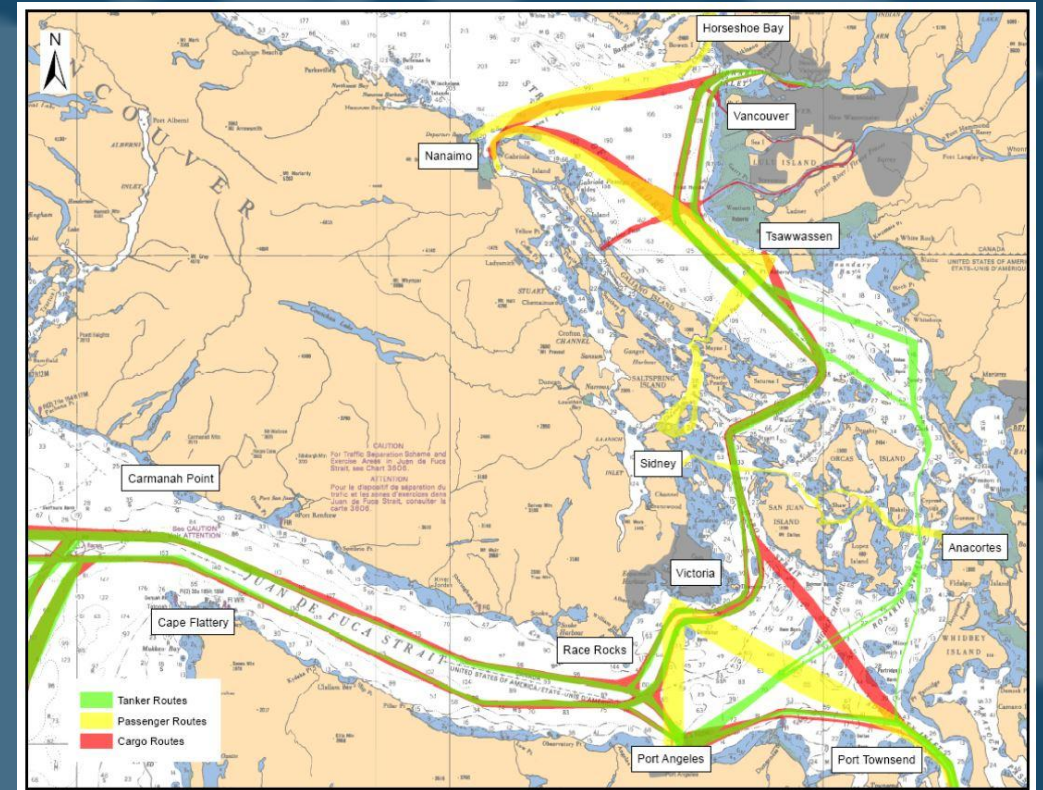
## British Columbia

- 60% Canada's Ocean Trade, Port of Vancouver & Port of Prince Rupert
- ~11,000 Vessels, Domestic Captive Fleet<sup>3</sup>
- \$19.2 billion annually in GDP<sup>1,2,3</sup>
- 180,000 jobs<sup>1,2,3</sup>

<sup>1</sup> Organisation for Economic Co-operation and Development

<sup>2</sup> Fishers and Oceans Canada, Blue Economy Strategy Engagement Paper

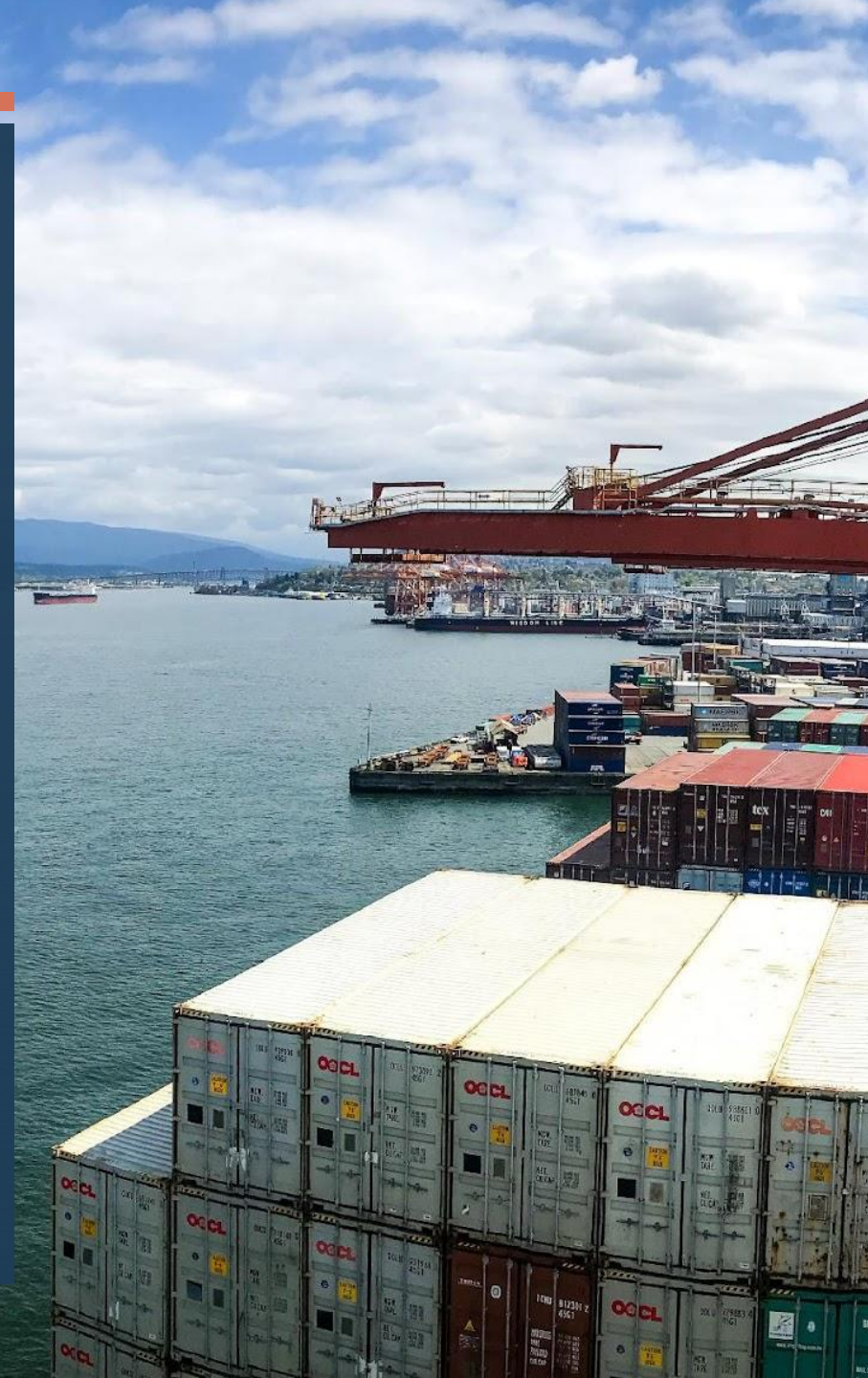
<sup>3</sup> Transport Canada Vessel Registry.





# VANCOUVER MARITIME CENTRE FOR CLIMATE (VMCC)

- Not for profit organization founded in 2020
- VMCC is an industry led initiative dedicated to accelerating the transition to a zero emissions shipping industry in British Columbia.
- [www.vmcclimate.ca](http://www.vmcclimate.ca)



# SIX PILLARS OF VMCC



Resource Hub



Convening Point



Information  
Dissemination



Commercialization  
& Pilot Testing



Technology  
Implementation



Communications

# INDUSTRY INVOLVEMENT

- 62 Members
- 28 MOU Signatories
- 24 Steering Committee
- 5 Industry Working Groups





# VMCC

1. Green Shipping Strategy
2. Work Groups
3. Operation Flagship



# GREEN SHIPPING STRATEGY

- The purpose of the Green Shipping Strategy (GSS) is to set a collective strategy for the B.C. marine and shipping industry to guide and coordinate efforts towards a zero-emissions industry.
- The strategy contains,
  - Goals for CAC and GHG reductions for the province of B.C.
  - Development pathways to achieve the goal
  - Operational activities for VMCC's Work Groups



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

This project was undertaken with the financial support of the Government of Canada through the federal Department of Environment and Climate Change.

Ce projet a été réalisé avec l'appui financier du gouvernement du Canada agissant par l'entremise du ministère fédéral de l'Environnement et du Changement climatique.



# VMCC STRATEGIC GOALS & EMISSIONS REDUCTION TARGETS

- Eliminate *domestic* shipping GHG & CAC emissions by 2050,
  - Intermediate reduction of **~40% by 2030** in line with federal & provincial targets.
- Decrease *deep-sea* shipping GHG & CAC emissions in BC waters **more rapidly than IMO ambitions.**

# THE PROPOSED STRATEGY FRAMEWORK





# WORK GROUPS



## RESEARCH & DEVELOPMENT

Direct and support R&D of earlier stage technologies and solutions.



## PILOT PROJECTS & COMMERCIALIZATION

Facilitate piloting, demonstration & commercialization of emissions reduction solutions via **Operation Flagship**.



## POLICY & REGULATION

Influence policy and regulation to incentivise and support emissions reduction



## GREEN FINANCING & FUNDING

Identify and secure sources of green financing for emissions reduction projects, technologies and initiatives



## VMCC

Support the development and growth of VMCC and the BC maritime innovation cluster



# JOINT INDUSTRY PROJECTS

- Joint Industry Projects can be,

- Feasibility Studies
- Pilot Projects
- Strategy Development
- Research & Development
- Reports

- JIP's relevant to the following categories,

1. Low-Carbon and Carbon-Neutral Fuel Solutions
2. Maritime Electrification
3. Port Operations & Infrastructure
4. Vessel Energy Efficiency
5. Emissions Abatement

Note:

- All JIP partners must have the support of their employer.
- Project partners are expected to support the JIP with resources such as technical expertise, test bed space and/or financial support depending on your organizations level of interest.
- VMCC will facilitate the signing of MOUs or NDAs as required for each JIP.



# EXISTING JIP'S

Legend:

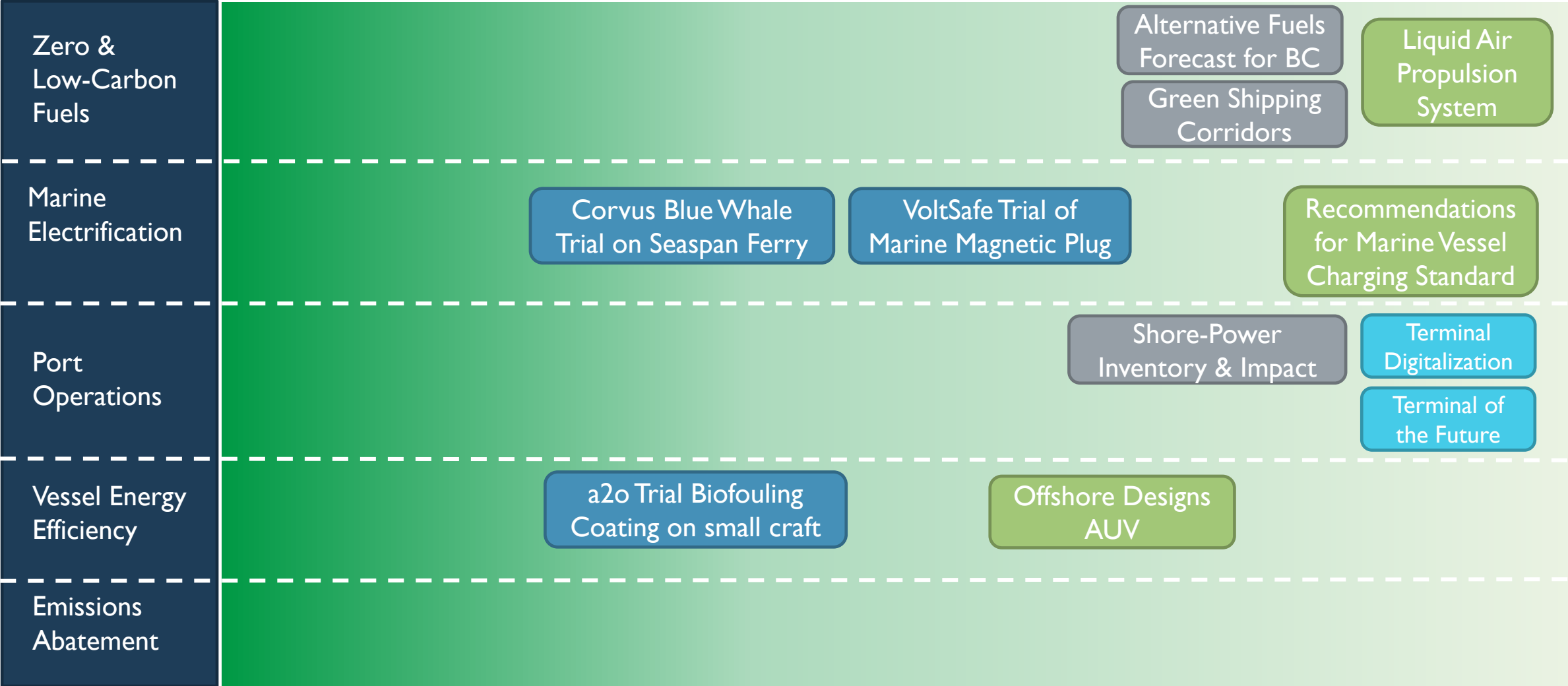
Pilot Projects

Feasibility Study

Strategy

Research & Development

Other



# OPERATION FLAGSHIP



- Technology commercialization program
- Designed to pair site hosts with innovators to solve decarbonization challenges
- Advantages
  - Obtain cost savings, emissions reductions and competitive advantage
  - New business opportunities
  - Stay ahead of market conditions





## ■ OPEN CALL Low-carbon and carbon-neutral fuel solution

### ■ Sustainable fuel supply BLUE BC CHALLENGE

- Alternative fuel port and bunkering infrastructure
- Shipboard machinery
- Competence development and operating practices

## ■ Maritime electrification

- Clean energy supply
- Onshore power infrastructure
- Energy storage and shipboard electrification

## ■ Port Operations and infrastructure

- Harbour operations and scheduling efficiency and digitalization
- Zero-emission port operations
- Port as a decarbonization-hub

## ■ Vessel energy efficiency

- Hull and propulsion
- Machinery and consumers
- Vessel operation efficiency and digitalization

## ■ Emissions abatement

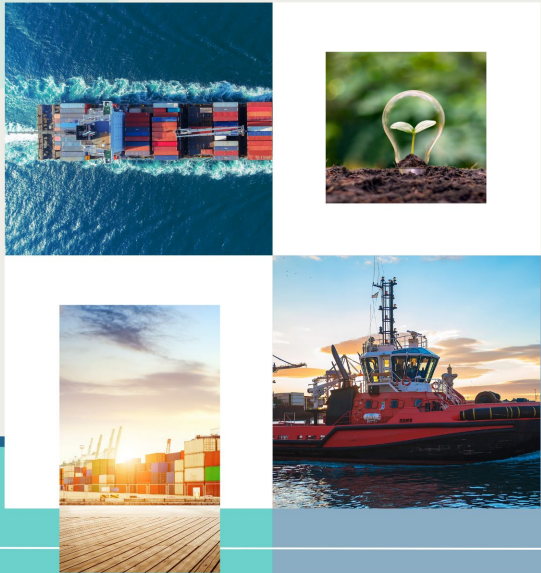
- Treatment and capture of GHG and CACs





# Blue BC Adopters

Blue BC Adopters coordinate with like-minded companies to share risks, costs and learnings.



visit [www.vmcclimate.ca](http://www.vmcclimate.ca) to learn more

## OPERATION FLAGSHIP: BLUE BC ADOPTERS

- Fortis Energy Inc & Port of Vancouver (reviewing applications for relevancy)
- Teekay
- BC Ministry of Transportation & Infrastructure
- Global Container Terminals
- BC Hydro
- Port of Prince Rupert
- Group Ocean



# Blue BC Advantage

VMCC provides maritime and shipping transport operators with a networking platform to source decarbonization technology specific to their needs.

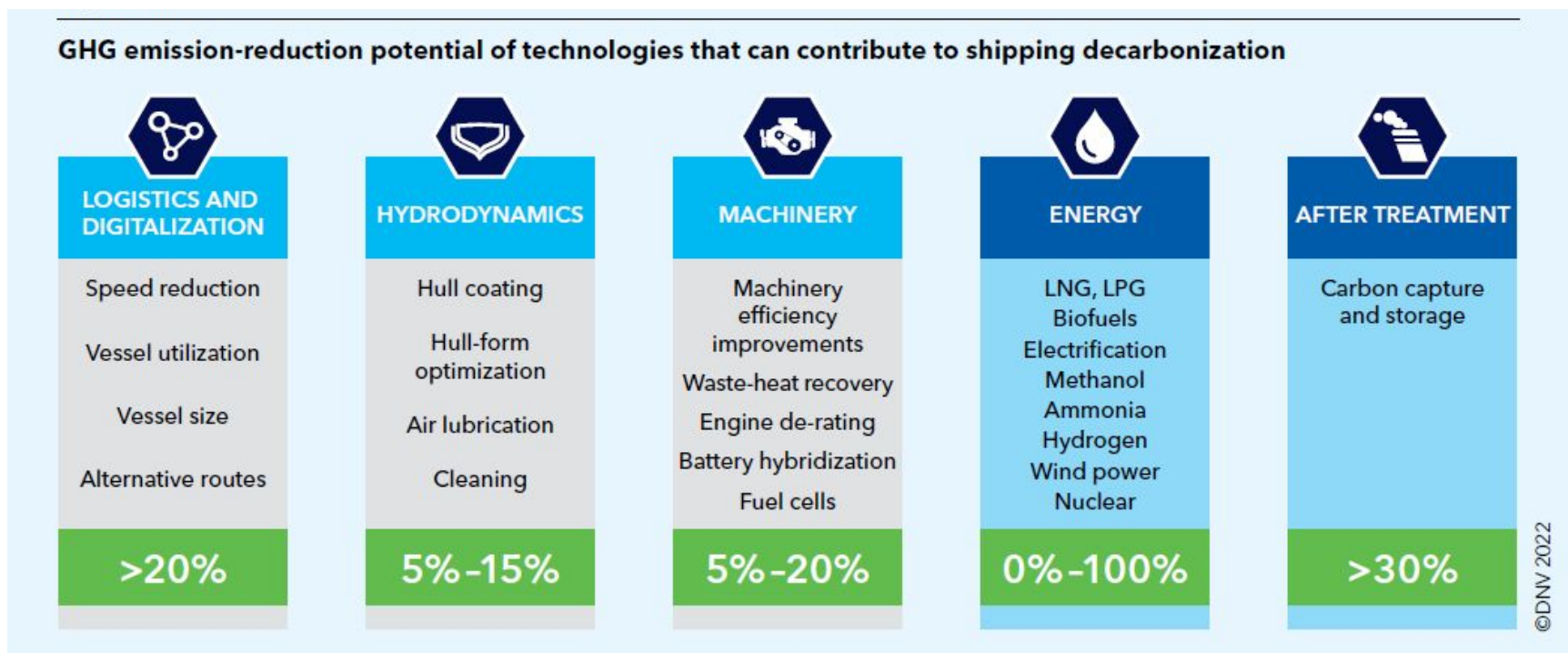
Become a Blue BC Adopter and join with other likeminded organizations to share risk, costs and learnings.

Learn more by visiting, [www.vmcclimate.ca](http://www.vmcclimate.ca)





# GETTING TO ZERO



# GETTING TO ZERO



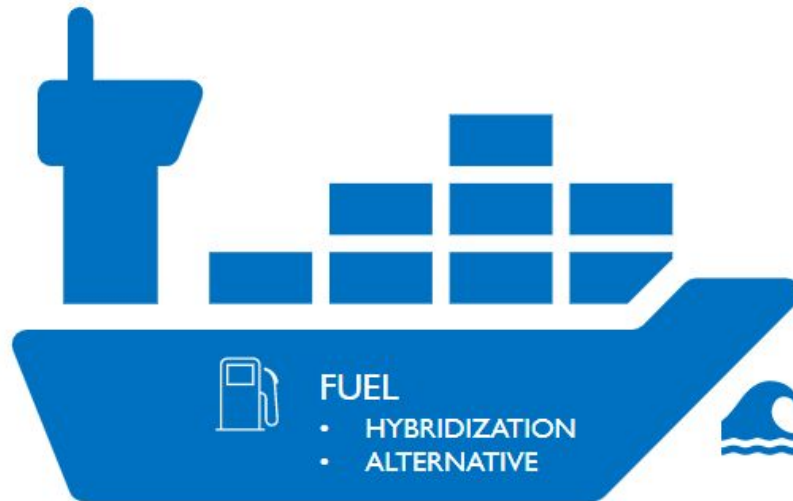
## OPERATIONAL

- SLOW STEAMING
- WEATHER ROUTING
- DRAFT TRIM OPTIMIZATION



## MACHINERY

- WASTE HEAT RECOVERY
- ME DERATING
- TC CUT OUT
- EXHAUST GAS RECIRCULATION
- VARIABLE FANS/PUMPS



## FUEL

- HYBRIDIZATION
- ALTERNATIVE



## HYDRODYNAMICS

- BULBOUS BOW
- PROPELLER
- NEW BUILD DESIGN
- HULL FORM



# IMPLEMENTATION CHALLENGES



Technical  
Maturity



Fuel Availability



Shore Side  
Infrastructure



Regulatory



Capital  
Expenditure



Energy Cost

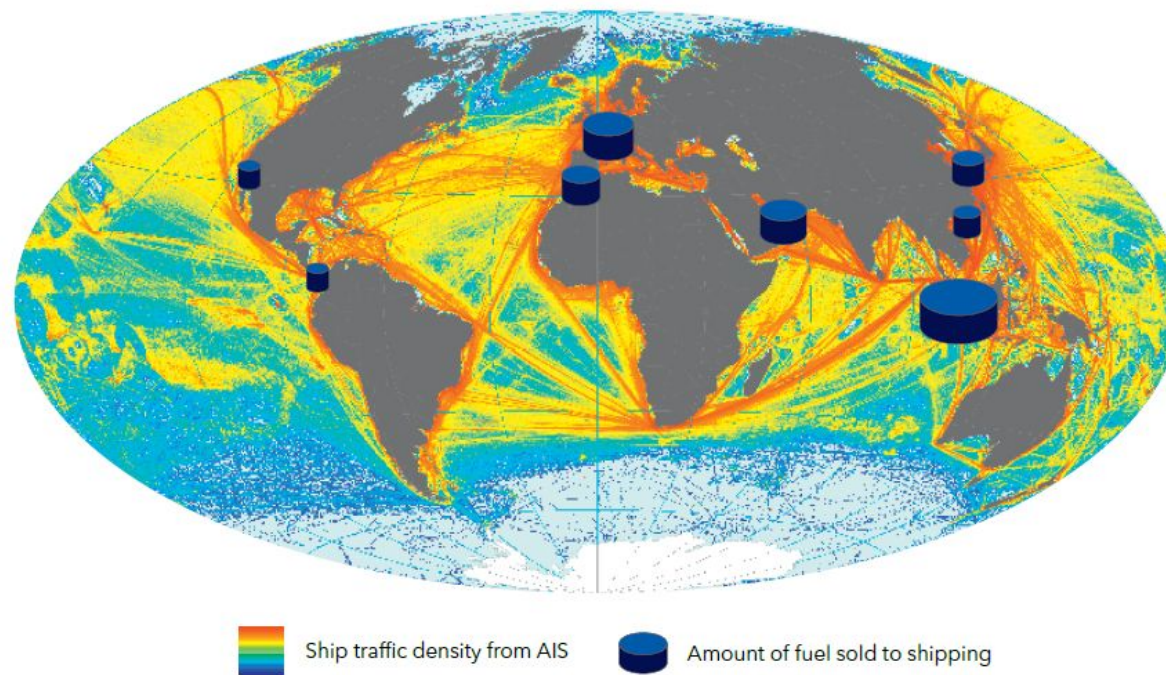


Volumetric  
Energy Density

# GLOBAL BUNKERING

Figure 4.1

Graphic shows 10 major bunkering hubs, with geographically close hubs combined, that provide an estimated 55% of fuel for international trade, and a heatmap of AIS data for ship traffic in 2021<sup>54</sup>



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<sup>54</sup> The bunkering volumes in the different hubs shown in the figure are estimates based on IEA and other sources, combining ports and areas that are geographically close - e.g., Algeciras and Gibraltar, Antwerp and Rotterdam





# GREENSHIP 2023

THURSDAY NOVEMBER 2ND

JW MARIOTT PARQ, VANCOUVER, CANADA

Canada's only conference focusing on maritime decarbonization and the need for industry transformation to achieve a sustainable, net-zero future. Drawing on industry experts from across North America for an exclusive one-day event showcasing progressive regional and global initiatives.

[WWW.VMCCLIMATE.CA](http://WWW.VMCCLIMATE.CA)

**OVER 30**  
DIVERSE SPEAKERS

**200+**  
ATTENDEES EXPECTED



# MEMBERSHIP



## Access

VMCC Platform  
Networking & Knowledge Sharing  
Technical Research Library  
Work Groups  
Global Market  
Government



## Assistance

Technology Sourcing  
Special Projects  
Optimization Support  
Pilot Projects  
Government & Industry Relations








## Recognition

Increased Industry Visibility  
Features & Stories  
Speaking Events  
Marketing & Comms  
Website Logo Recognition



# MEMBERSHIP FEES

## Membership Fee Schedule

			
Large	Medium	Small	Other
<b>\$5,000 annually</b>	<b>\$2,500 annually</b>	<b>\$1,500 annually</b>	<b>\$750 annually</b>
Corporations with more than 150 employees.	Corporations with 51 - 150 employees.	Corporations with 10 - 50 employees.	Corporations with under 10 employees as well as startups and academia.
			
Associate	Reciprocal		
<b>\$100 annually</b>	-		
Private citizens who are not representing a privately-owned consulting company.	Industry associations, not-for-profits, non-governmental organizations (NGO's), and government agencies.		

THANK YOU



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