Zero-Emissions Shipping:

A Pragmatic Pathway for Arctic and Global Decarbonization

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1 Why Focus on Arctic Shipping?

Growth in Arctic shipping is BAD NEWS and the result of a destabilised Arctic environment

The Arctic is warming **3x faster** than the rest of our planet

The overall **thickness**, volume and age of sea ice has **decreased by 80%** since 1979.

The post-winter **sea ice** volume in **April 2021** was the **lowest** since records began in 2010.

In 2021, **rain - not snow** - fell for the first time at the **Greenland** Summit Station.

In 2020, the **highest temperature ever** was recorded in the **Arctic at 38˚C** (100˚F).

What happens in the Arctic doesn't stay in the Arctic.

Ice sheets, melting glaciers and thermal expansion across the planet are already projected to **raise sea levels between 1 – 2m by 2100**, even if global heating can be restricted to no more than 1.5˚C.

The **shipping industry** must rapidly **reduce CO_2 and black carbon emissions** and their effect on the Arctic.

Reversing the loss of the Arctic ice sheet, glaciers and sea ice **is critical** to the future of Arctic wildlife, communities and the planet.

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2 What's at Stake Globally?

30%
Emission reduction
by 2030

80%
Emission reduction
by 2040

100%
Emission reduction
by 2050

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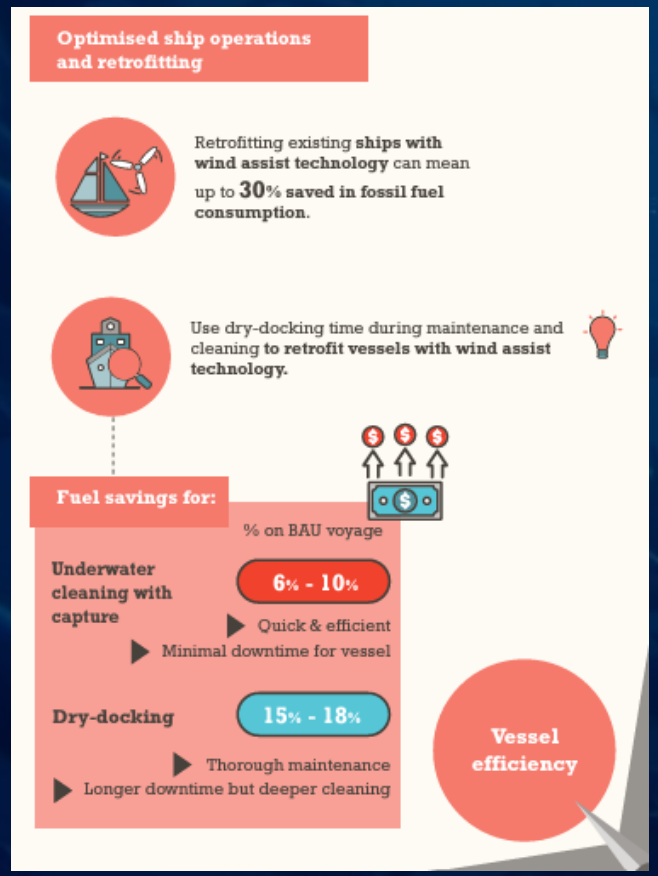
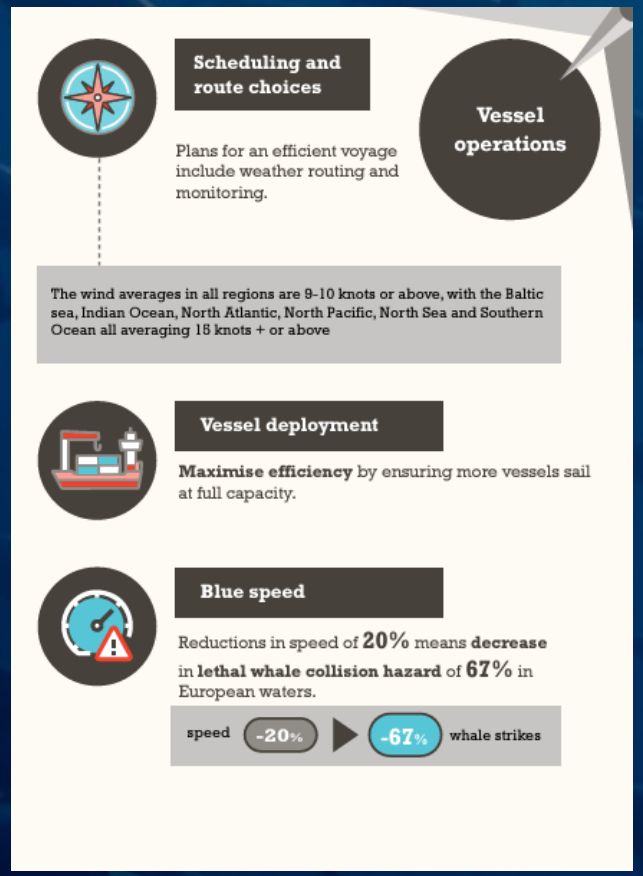
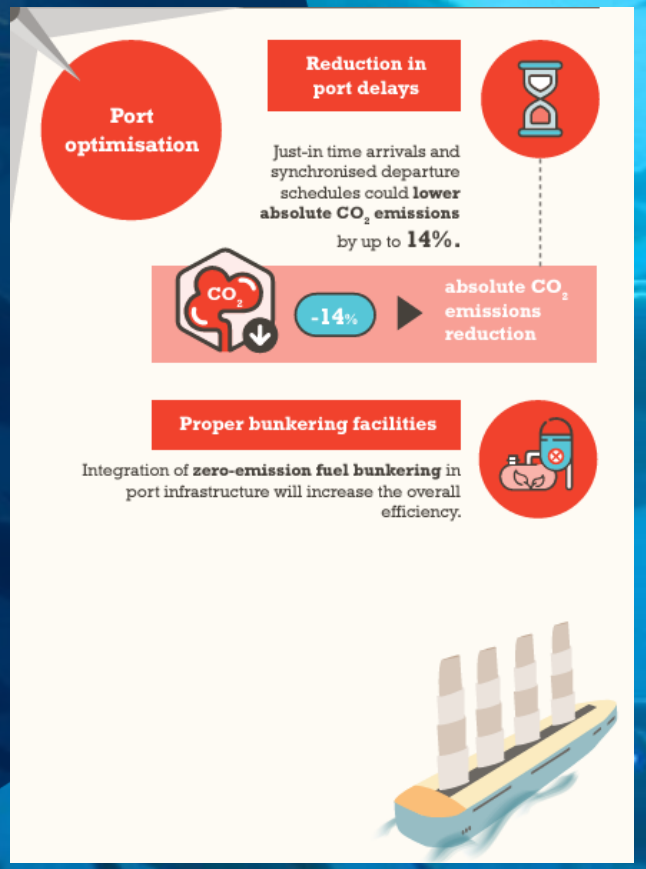
2 What's at Stake Globally?

3 Hierarchy for Transition to Zero Emissions

Energy Efficiency - A First Practical Step:







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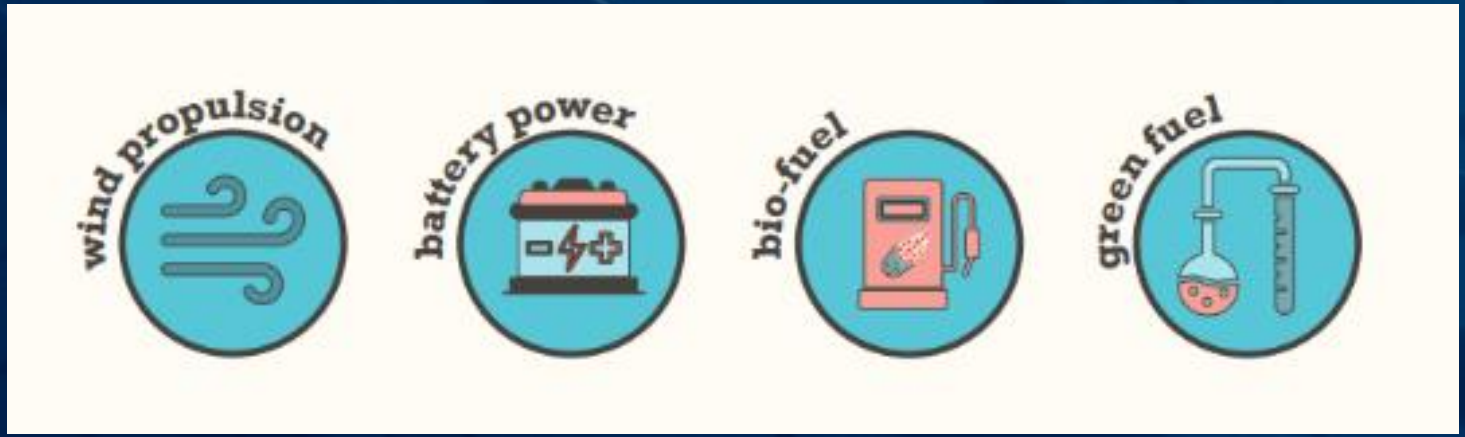
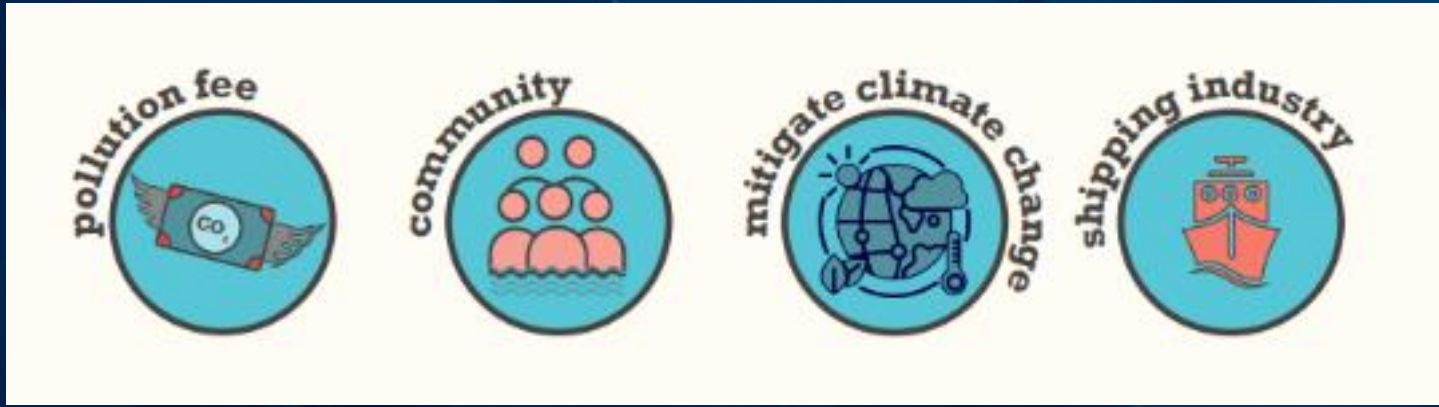
Addressing Challenges of New Fuels:



The Role of an Equitable Emissions Levy:



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To transition the shipping industry successfully to zero carbon, we need:

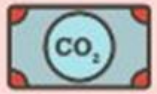
Stronger and enforceable **CII requirements** + A global **GHG fuel standard** transitioning away from polluting fuels to carbon neutrality + An **ambitious carbon levy** for a low-cost transition

Carbon Intensity Indicator (CII)

- Maximising ship efficiency to minimise fuel consumption;
- Overcoming barriers to adopt new tech and practices;
- Reducing ships' speed to provide important ocean health co-benefits.

Global Fuel Standard (GFS)

- Ensuring the uptake of readily-available wind technologies;
- Making sure zero-emission fuels are available when needed.



Levy

- Incentivising clean shipping;
- Reducing the cost gap between old polluting fuels and zero-emission fuels;
- Distributing the revenue gained towards a just & equitable transition.

Thank you

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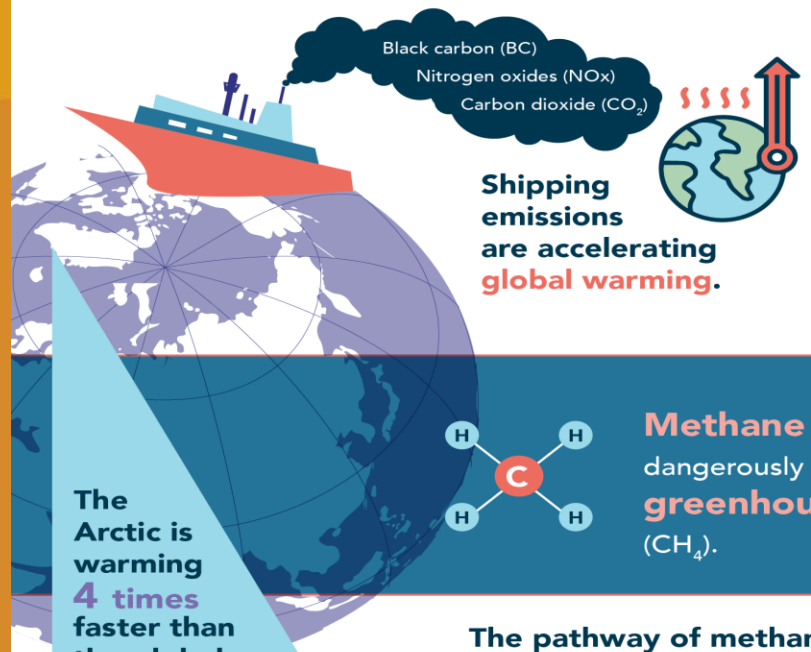
Liquefied Natural Gas (LNG) is a threat to the Arctic



Shipping emissions are accelerating global warming.

On route to shipping decarbonisation...

In an effort to reduce black carbon and greenhouse gas (GHG) emissions, shipping is looking to move away from oil based fuels.

However some alternatives including Liquefied Natural Gas (LNG), are still fossil fuels.

...but LNG must not be part of the solution.

LNG is predominantly made up of methane, a short-lived climate forcer more potent than CO_2.

The Arctic is warming 4 times faster than the global average!

Methane is a dangerously **potent greenhouse gas** (CH_4).

It has a **warming effect** up to **80 times** more powerful than CO_2 over a 20 year period (GWP20).

Emissions from LNG-fueled ships grew by **150%** between 2012 to 2018.

The pathway of methane emissions from LNG fuel

When **burned by ships, LNG releases methane** and other pollutants into the atmosphere.

Additionally, the **process of extracting, processing, and transporting of LNG** results in **methane leakage**. These activities can also cause significant environmental impacts including habitat destruction, water pollution, and climate heating.

Global heating is speeding the Arctic permafrost thaw

The **fragile Arctic permafrost ecosystem** already under threat from global heating could be reaching a **global tipping point**.

- Arctic terrestrial permafrost contains 2x carbon as in the atmosphere.
- As the Arctic heats up, shallow permafrost starts to thaw.
- Thawing permafrost releases CO_2 and CH_4 into the atmosphere.
- Released CO_2 and CH_4 add to the global burden of GHGs - speeding global warming.
- Burning LNG as fuel adds to the acceleration of Arctic permafrost thaw and a potential and irreversible tipping point being reached.

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