

Reducing the Impact of Shipping's Atmospheric Emissions on the Arctic: Progress and Future Opportunities

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Clean Arctic Alliance
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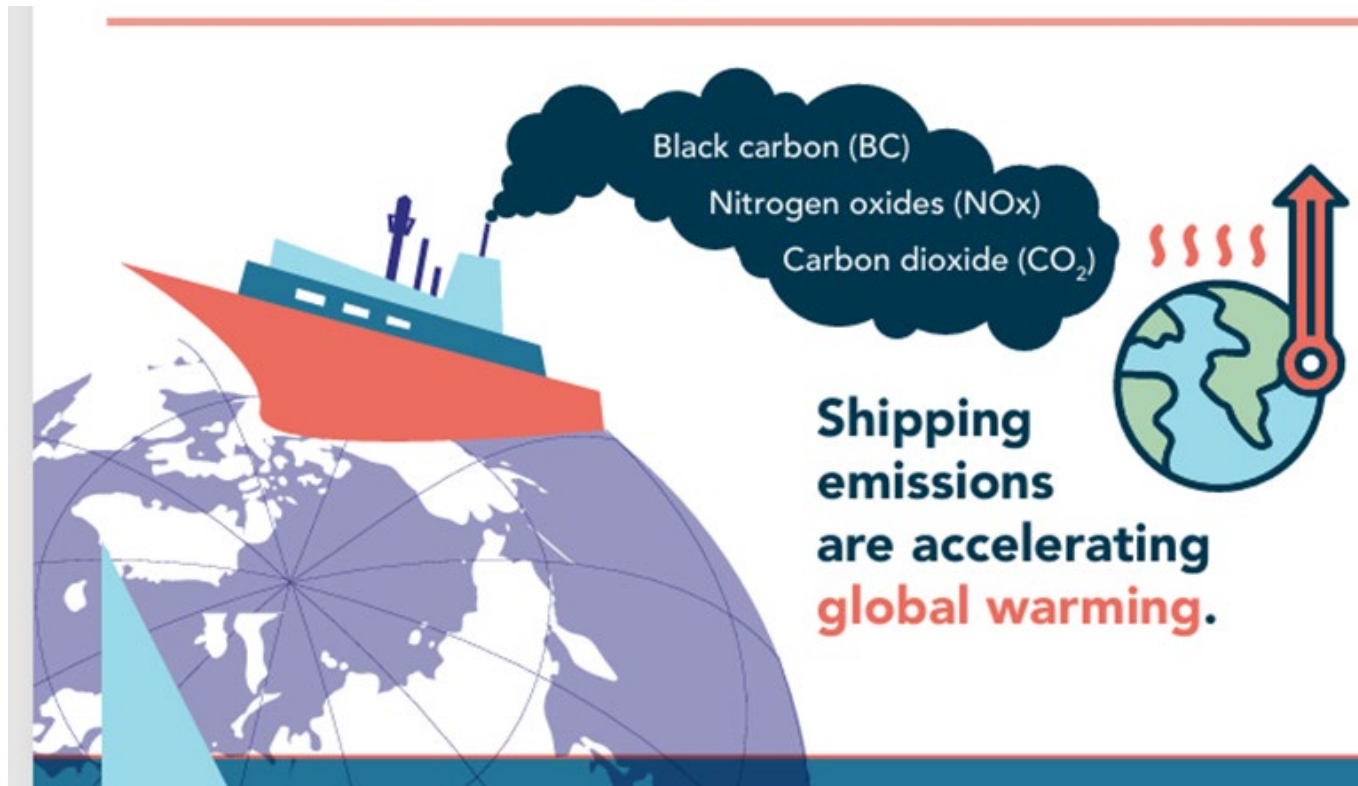
Formed in 2016
24 non-profit member
organisations



THE CLEAN ARCTIC ALLIANCE IS WORKING TO PROTECT THE ARCTIC FROM THE IMPACTS OF SHIPPING


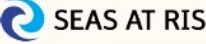
Atmospheric emissions from ships

- Carbon dioxide (CO₂)
- NO_x, SO_x and particulate matter
- Black carbon
- Methane



Greenhouse gases

Setting a vision for a clean, green, decarbonised future





Navigating towards the solution: the Carbon Intensity Indicator (CII), a global GHG fuel standard and a levy

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

Background




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.

Different tools for different jobs

Ocean health

By reducing speed and achieving greater efficiency, ships will produce lower GHG emissions and ensure healthier oceans and communities:

- Reducing the emissions of **black carbon** and other **air pollutants** from dirty fuels
- Safeguarding **food security** and supporting **healthy communities**
- Reducing **underwater noise** pollution as well as the number and fatality of **whale strikes**

Helping the ocean will help us combat the climate crisis!

Navigating towards a clean, green, decarbonised future

Why the IMO and international shipping needs a strong revised Carbon Intensity Indicator (CII)

The CII is key to creating **more energy efficient ships** and **cutting emissions** in the short-term.

Currently, the CII is not realising its full potential!

The revision of the CII, due to start at MEPC82 and conclude by 2025, is a key opportunity to bring it up to date with the **revised GHG Strategy** and to make sure that it works in the future in a coherent way with the basket of **mid-term measures (BoM)** being negotiated at the same time.

Strong CII + BoM = Success!

Background

Despite global commitments to **keep global heating below 1.5C**, we have already reached 1.2C. Setting emissions targets to be reached in the near-term will be key to **avoiding climate tipping points**.

Only through improved efficiency – and wind power – will the IMO be able to hit its GHG reduction goals. And CII is the tool that can drive these improvements in the most cost-effective way.

Levels of ambition and CII

New GHG Strategy emission reduction targets:

Year	Target Reduction	Efficiency Contribution
by 2030	-30% to -40%	~ 3/4 of reductions from efficiency
by 2040	-80%	~ 1/2 of reductions from efficiency
by 2050	-100%	~ 1/3 of reductions from efficiency

In the meantime, emissions have continued to rise, so the gap between the target and actual 2030 Business as usual (BAU) could be as high as 40%.

Efficiency will have to deliver a large part of the emission reductions as new fuels will only enter the market slowly.

New IMO strategy not perfectly aligned with 1.5C so above numbers are absolute minimum.



Emission Control Areas - Reducing Air Pollution from Shipping to Protect the Arctic

- NOx
- SOx
- PM

Type of ECA	Entry into effect	Benefits		
SOx/PM	Year	Reduce emissions of SOx/PM	Reduce emissions of BC	Cut premature deaths
NOx	Year	Reduce emissions of NOx	Air quality improvements	Protect ecologically sensitive ecosystems



Some positive developments:

- ✓ Designation as of May 2024 of the **Mediterranean Sea** as an Emission Control Area for SOx/PM.
- ✓ Declaration of intent to designate a new ECA by **North East Atlantic Ocean** littoral states.
- ✓ The **Canadian Arctic** and **Norwegian Sea** ECAs are now adopted and will come into effect in March 2026.

- Established ECAs
- Newly adopted ECAs
- Possible future ECAs



Watch out!

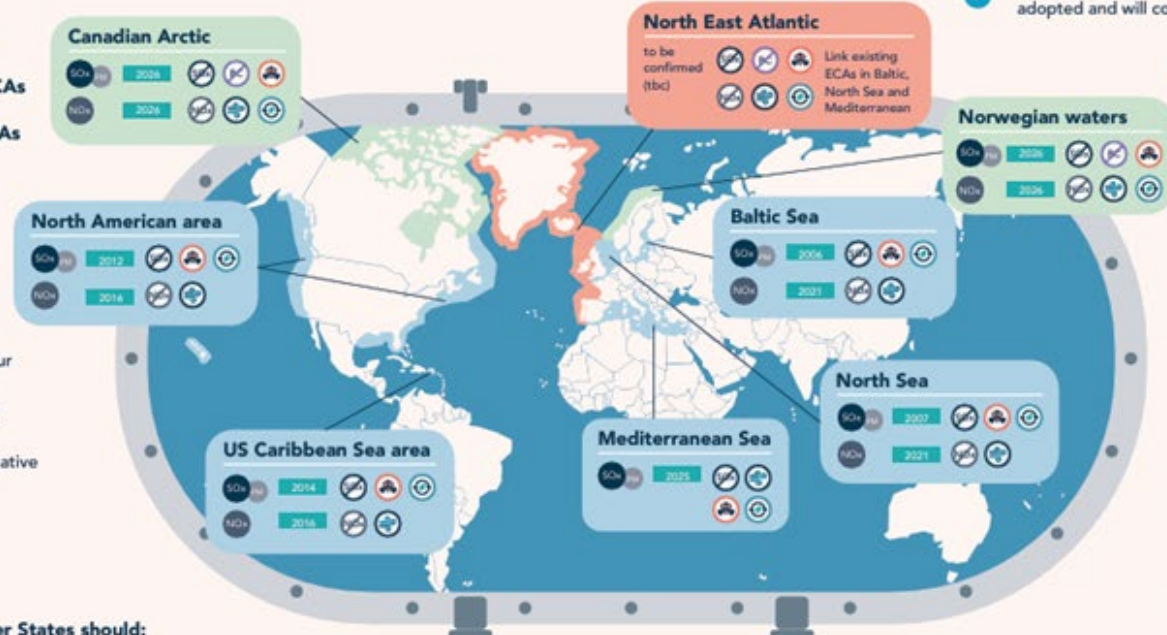
Avoid counter-productive solutions such as:

- Use of ultra low sulphur fuel oil (ULSFO)
- Switching to liquefied natural gas (LNG)
- Scrubbers as an alternative compliance method



IMO Member States should:

- Incorporate **Indigenous Knowledge** in Arctic ECA proposals.
- Establish **additional ECAs** to link the Mediterranean Sea ECA with the North Sea and Baltic Sea ECAs and extend north to the Arctic including the waters off Norway, Iceland, the Faroe Islands, Greenland and Canada.
- Extend the **Mediterranean Sea ECA to cover NOx** emissions.
- By 2026, designate new ECAs that will contribute to **reducing air pollution in the Arctic** and will benefit Arctic ecosystems and Indigenous People.



Benefits for the Arctic

ECAs contribute to tackling impacts of SOx / PM including BC / NOx in sensitive ecosystems like the Arctic.



Establishing ECAs in the Arctic and the North East Atlantic could dramatically cut BC emissions impacting the Arctic if distillate or other cleaner fuels are used as the compliant fuel – not ULSFO.



It is important that ECAs build on **Indigenous perspectives and Knowledge**.



ECAs will also reduce emissions of PAHs and heavy metals



Black
carbon

a potent
short-lived
climate
pollutant

How to regulate and control black carbon emissions from shipping

Black carbon (BC) is a short-lived **climate pollutant** produced by the incomplete **burning of fossil fuels**.

Contributes to **warming** while in the atmosphere

Accelerates **melting** and habitat loss if deposited onto snow & ice

Melting snow and ice leaves **darker areas** of land and water which absorb further heat from the sun

Negative impact on **human health**

Impact over **3000x** CO₂ (GWP20)

Around **1/5** of shipping's CO₂e emissions

Reflective capacity of polar ice caps is **reduced**

Disproportionate impact in the Arctic and on climate vulnerable Indigenous communities

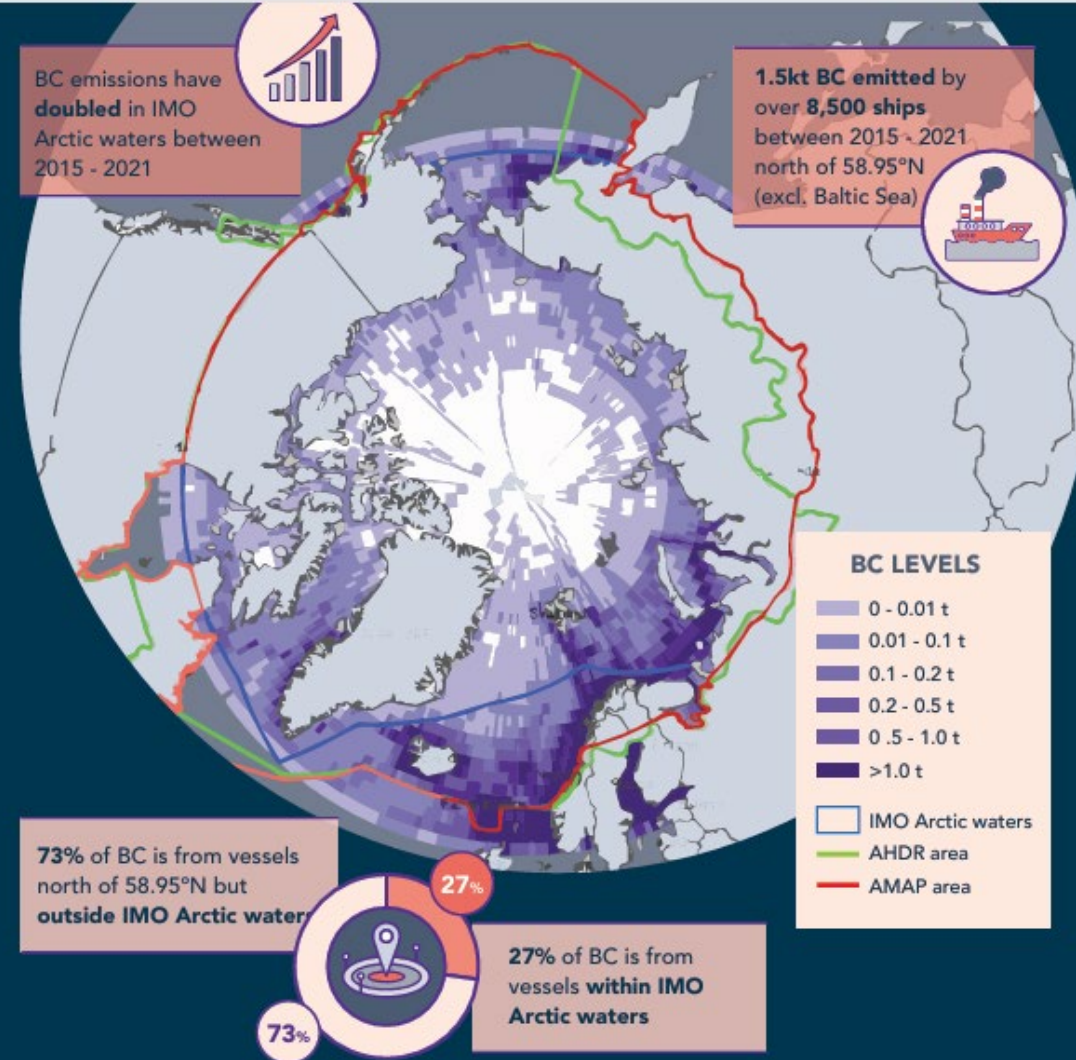


- BC emissions have doubled
- 73% of BC comes from vessels in the Arctic but not in Arctic waters (Polar Code)
- Resolution MEPC.342 (77) – voluntarily use cleaner fuels to reduce black carbon
- Regulating polar fuels

Measures to reduce the impact of black carbon from ships must apply throughout the Arctic

Measures must have a sufficiently **wide geographic scope** to:

- 1 reduce the impact of all shipping BC on the Arctic
- 2 address shipping BC emissions in and near the Arctic (incl. airborne transportation of BC to the Arctic)



Graphic adapted from ICCT map of black carbon emissions (2021)

- Agree the concept of polar fuels
- Agree to regulate the use of polar fuels under MARPOL Annex VI

IMO Member States must...

1

Agree to **immediate action to regulate emissions of black carbon from ships** which impact the Arctic.

2

Develop **compulsory measures to reduce black carbon emissions from ships**, including:

- a new regulation in MARPOL Annex VI requiring the use of **polar fuels** in the Arctic
- develop the concept of new Arctic BC emission control areas
- use of technology to reduce BC emissions

3

Support **regional and domestic action** to rapidly lower black carbon emissions from ships.

Polar fuels:

Distillate marine fuels*



Other suitable fuels

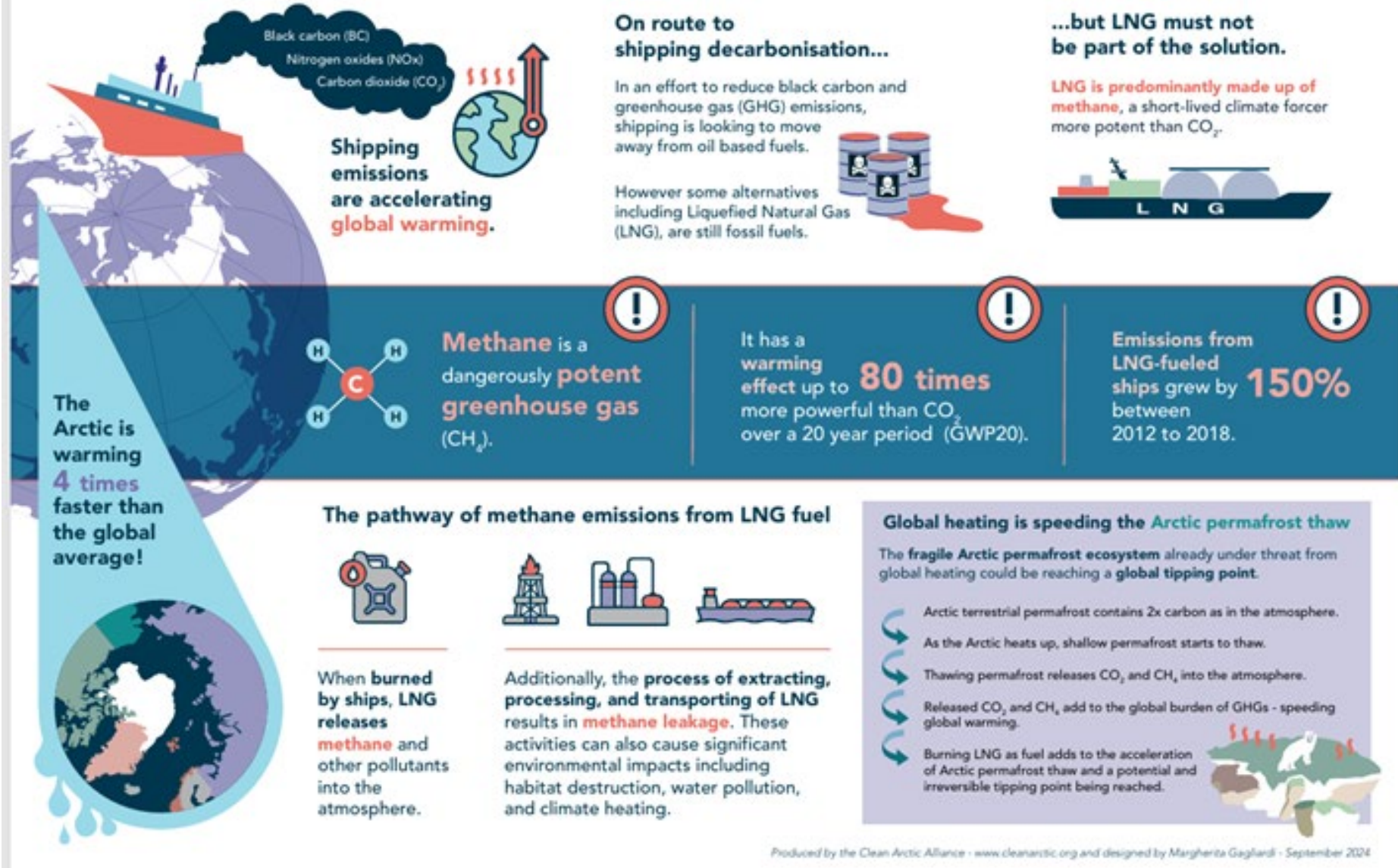
*DMA / DMZ



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

Methane

a potent short-lived climate pollutant



Shipping emissions are accelerating global warming. Black carbon (BC), Nitrogen oxides (NOx), Carbon dioxide (CO₂)

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 CO₂.

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

Methane is a dangerously **potent greenhouse gas** (CH₄).

It has a warming effect up to **80 times** more powerful than CO₂ 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 CO₂ and CH₄ into the atmosphere.
- Released CO₂ and CH₄ 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.

Produced by the Clean Arctic Alliance - www.cleanarctic.org and designed by Margherita Gagliardi - September 2024



In the polar regions

- Reduce emissions of CO₂, NO_x, SO_x, BC, methane by 2030
- Increase energy efficiency
- Wind-assisted and wind propulsion
- Onshore power supply
- Move to safe low and zero emission fuels with climate and air quality benefits



The Arctic is at a crossroads that could reshape its maritime future. Promoting the continued use of any fossil fuels, including LNG, will impede the transition to a zero-emission economy.

The Clean Arctic Alliance is calling for:

- 1 Arctic nations to require all ships to **urgently reduce emissions of CO₂, black carbon, and methane by 2030**, and move to alternative, non-fossil fuels and other forms of propulsion;
- 2 ships operating in the Arctic to immediately **switch from heavy fuels to distillate fuels or cleaner non-fossil fuels** in order to cut ship black carbon emissions;
- 3 the **shipping industry to focus on energy-saving practices and technologies**, such as wind propulsion, batteries, low and zero-emission fuels that can deliver air quality and climate benefits; and
- 4 public and private sectors to **stop investing in LNG infrastructure** that will cause further delays for the sector to transition to low and zero emission propulsion and fuels in the future.

Sign the Beyond Methane pledge
<https://saynotolng.org/beyond-methane-pledge/>

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Thank you

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