

Open letter to marine engine manufacturers for transparency on N₂O & NH₃ emissions from ammonia engines

The shipping sector must accelerate its decarbonization efforts to meet the goals of the Paris Climate Agreement, and new regulations and private initiatives are requiring accurate well-to-wake (WtW) greenhouse gas (GHG) emissions accounting. To ensure a level playing field, shipping companies, policymakers, and civil society must have access to reliable and complete information on the GHG emissions associated with different fuels and technologies. This isn't the case at the moment.

The lack of transparent and complete information on nitrous oxide (N₂O) and ammonia (NH₃) emissions from the forthcoming ammonia-powered engines complicates regulatory design and investment decisions by shipowners. This is especially worrying because N₂O is 273 times more potent of a greenhouse gas than CO₂, and NH₃ emissions contribute to air pollution and indirect N₂O emissions.^{1,2}

To address this, **we call on marine engine manufacturers to publicly release granular data on N₂O and NH₃ emissions from ammonia-powered marine engines.**

For these ammonia-powered engines (including dual-fuel engines), we request preliminary N₂O and NH₃ emissions data from laboratory tests. Manufacturers should provide N₂O and NH₃ emission rates in g/kWh or as a percentage of fuel consumption for the following load points: 5%, 10%, 15%, 20%, 30%, 40%, 50%, 60%, 70%, 75%, 80%, and 90% of maximum continuous rating (MCR). The wide range of load points accounts for the strong impact of load on emission rates.^{3,4,5,6,7,8} We are aware of the sensitivities associated with new technologies under development, and we stand ready to work with manufacturers to help collect this data in an independent, secure, and credible fashion.

The shipping industry has been a latecomer in taking responsibility for climate change, and transparency will go a long way to help industry and policymakers make informed decisions about deploying alternative marine fuels. It will also increase the trust of civil society and policymakers in the alternative fuels offered as a solution to global warming, and stimulate much-needed investments for their large-scale deployment.

¹ Forster, P., et al (2021). [The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity](#). In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

² NABU, Öko-Institut (2021). [Ammonia as Marine Fuel](#)

³ Van Roy, Ward, et al. (2022). [Airborne monitoring of compliance to NOx emission regulations from ocean-going vessels in the Belgian North Sea](#). Atmospheric Pollution Research.

⁴ Fridell, E. et al (2023). [SCIPPER D5.5](#): Policy recommendations related to regulations, monitoring and enforcement. EU Horizon 2020 Project.

⁵ Comer, B., et al. (2024). [Fugitive and Unburned Methane Emissions from Ships \(FUMES\)](#): Characterizing methane emissions from LNG-fueled ships using drones, helicopters, and onboard measurements. International Council on Clean Transportation.

⁶ Comer, B., et al. (2023). [Real-world NOx emissions from ships and implications for future regulations](#). International Council on Clean Transportation.

⁷ Knudsen, B., et al. (2022). [NOx Emissions from Ships in Danish Waters](#). Explicit Aps and Ministry of Environment of Denmark.

⁸ Knudsen, B., et al. (2022). [Evaluating NOx Emission Inventories For Ocean-Going Vessels Using Real Emissions Data](#). Explicit ApS.

We thank you in advance.

On behalf of:

Transport & Environment

Solutions for Our Climate

Opportunity Green

Stand.Earth

High Ambition Climate Collective

Pacific Environment

Ocean Conservancy

Environmental Defense Fund

Friends of the Earth - United States

NABU (The Nature And Biodiversity Conservation Union)

Oceans North

Surfrider Foundation Europe

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Zero Emission Ship Technology Association

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