

PROBLUE

IMPACT STORIES



Decarbonizing Maritime Shipping Drives Results for People and Planet

CHALLENGE

Moving 80 percent of all global trade, maritime shipping and ports often operate outside the general public's view or consideration. Developing countries rely on maritime shipping for basic goods like food, energy, and pharmaceuticals due to its relatively low transport cost.

Ports represent important gateways for development, fostering economic growth and allowing countries to participate in global trade and develop their Blue Economy. Yet, emissions from ships account for approximately three percent of global anthropogenic greenhouse gas (GHG) emissions. If the sector were a country, it would be the world's sixth-largest emitter. According to the Intergovernmental Panel on Climate Change (IPCC), greenhouse gases must be cut by 43 percent in 2030 to stay in line with the Paris Agreement temperature targets. Therefore, deep emissions cuts across all sectors are necessary. In transport applications, system-transforming mitigation measures are critical. For maritime transport, most importantly, ramping up the production of green fuels, such as green ammonia and methanol.

In terms of climate action, often two shipping-related opportunities go unnoticed. First, international shipping is, alongside aviation, one of the few sectors worldwide that are globally regulated. This offers a unique opportunity to exploit the sector's large climate change mitigation potential through energy efficiency and clean fuels. Second, shipping can help deliver on the global community's broader climate targets. Maritime decarbonization involves more than reducing the carbon footprint of container ships, ports, tankers, or cruise ships. It can also serve as a powerful enabler to decarbonize the broader economy.

APPROACH

With strategic support from the multi-donor trust fund PROBLUE, the World Bank has been tackling shipping GHG emissions from two entwined angles. On a global level, the Bank supports countries in the climate policymaking process at the International Maritime Organization (IMO), the UN-specialized agency for shipping. On a national level, the Bank works with an increasing number of developing countries to build a pipeline of groundbreaking investment projects aimed at producing zero-GHG shipping fuels and developing green shipping initiatives while adopting a Blue Economy approach.

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“Shipping’s decarbonization will depend on hydrogen, and the success of the hydrogen economy will depend on shipping and ports.”

—Dominik Englert, Senior Economist, World Bank, Global Transport Unit

How can shipping make South Africa a leader in hydrogen? As countries aim to reduce their domestic GHG emissions, green hydrogen will be in high demand, especially in harder-to-abate sectors like transportation, chemicals, and heavy industries. To advance the green production of green shipping fuels in developing countries, the World Bank and PROBLUE support engagements in countries that could serve as future supply hubs. In South Africa, PROBLUE funding supports detailed pre-feasibility assessments in high-potential port locations, exploring the use case for producing and supplying green marine fuel. The Bank has identified two high-potential investment project cases in the port of Saldanha Bay and the future port of Boegoebaai. In the broader context, South Africa aims to capture a significant share of the global hydrogen market. This green hydrogen economy is projected to contribute 3.6 percent to South Africa’s GDP and create 380,000 jobs by 2050. While the country is attracting increasing private sector interest in green hydrogen projects, the overall success of this new industry hinges on first-mover projects to move forward.

What does this mean for South Africa? Translating the hydrogen ambition into development opportunities is one of the key objectives of the PROBLUE support. To understand the demand for green hydrogen from international shipping in the form of marine fuels, the Bank has analyzed the hydrogen demand in South Africa’s eight commercial seaports. A potential green ammonia production project in Saldanha Bay alone would be worth up to \$2 billion, producing 50,000 tons of green hydrogen. Such investment in the Southern Hemisphere’s largest natural deepwater port would displace around 400,000 tons of carbon emissions from ships and eliminate air pollution to almost zero.

In a base case, up to 56,000 tons of annual hydrogen demand in South Africa’s ports could come from the supply of marine fuel, as early as 2030. By 2050, this demand could rise to over half a million tons per year. In addition, the country could supply ships, which are not bound for South African ports, but are passing by the Cape of Good Hope – a major maritime waypoint. By 2050, this traffic could add a substantial two million tons of green hydrogen demand. As opposed to other hydrogen markets, for which South Africa would compete on price in distant economies, demand from ships is unique, as the “customer comes to you”. South Africa can reduce the competition disadvantage with countries, which may either have better renewable resources or access to lower financing cost. The higher cost of capital in emerging economies remains a challenge for hydrogen projects since it significantly influences the production cost of hydrogen.



*The port of Saldanha Bay can turn into a hydrogen hub
Photo credit: The World Bank/Rico Salgmann*

Learning from the first-movers. Shipping operates globally – therefore, the Bank is strategically pursuing engagements close to key maritime chokepoints, along which the supply of zero-carbon fuels will be essential. South Africa, for example, is situated on a strategic maritime waypoint – the Cape of Good Hope. Colombia is less than 500 kilometers from the Panama Canal, and Morocco is bordering the Gibraltar Strait which facilitates the passage of half of the world trade. Colombia and Morocco are also working with the Bank to identify opportunities to supply green shipping fuels. They are not only strategically located but show one of the best solar and wind resources to produce green hydrogen cost-competitively. In addition, Türkiye, home to the Bosphorus, a critical shipping strait between the Mediterranean Sea and the Black Sea, can position itself to become an enabler of maritime decarbonization.

PROBLUE-supported activities in decarbonizing maritime transport are paving the way to advance concrete investment projects in developing countries. Equally important, PROBLUE support is accelerating the development of the necessary global policy framework at the IMO. The activity contributed to the adoption of the 2023 IMO greenhouse gas strategy, a major milestone in global climate policy, which some observers consider the most significant climate deal of this decade.

As a next step, the program will help IMO member states develop the first global ship emissions pricing scheme. In developing countries, the Bank works towards taking the identified investment opportunities to market.



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RESULTS

With [PROBLUE](#) support, this World Bank work has influenced the global maritime decarbonization agenda. It has informed new dialogues, shifted policy, informed debate, and promoted climate action, inclusiveness, and resilience. Here are some results highlights:

- **Learning from first-mover projects.** The Bank's engagement in South Africa has drawn significant attention. In three stakeholder workshops between 2022 and 2023, over 150 experts from government, research, and the private sector discussed how these first-mover projects can be brought to life. Demand aggregation, an enabling environment, and financial de-risking are key solutions, among others. South African experience has informed and inspired similar country engagements in Brazil, Colombia, Morocco, Panama, Türkiye, and the East Asia Pacific region.
- **Analysis leading to action.** In June 2023, member states at the IMO have raised shipping's climate ambition to reach net-zero GHG emissions by 2050. PROBLUE-funded World Bank analysis informed and facilitated the adoption of this landmark agreement which sets out the two policy measures to lead shipping towards net-zero emissions: A greenhouse gas fuel standard and a global emissions pricing scheme.

- **Public-private partnerships.** Together with other development partners, the PROBLUE support enabled the Bank to engage in supporting the public sector and the private sector to advance and de-risk lighthouse investment projects.
- **Strategic support.** PROBLUE supported engagement informed the inclusion of shipping fuels as a key demand sector for South Africa's Green Hydrogen Commercialization Strategy, and the national port operator's port planning.
- **Awareness raising and knowledge creation.** The World Bank, with the support of PROBLUE, published and developed:
 - Three reports on [zero-carbon fuels for ships](#). These contributed to a broader public awareness of the negative impacts of using liquefied natural gas for shipping and contrasted the benefits of hydrogen-based fuels. The reports have been cited by the EU, OECD, client countries, top-tier news media, and policymakers (combined 18,000+ downloads, 40+ press articles, and more than 20 policy papers). The underlying analyses spurred pre-feasibility assessments in several countries to explore their potential as future producers and suppliers of zero-GHG shipping fuels.
 - Two reports on [carbon pricing for international shipping](#), which investigated how the use and [distribution of carbon revenues](#) can support an effective and equitable maritime energy transition (5,000 downloads). At the IMO, these reports have been referenced and quoted by many countries, industry, and civil society groups. Overall, these analytics informed the process of adopting the 2023 IMO Greenhouse Gas Strategy, which raises shipping's climate ambition from 50 percent reductions to net-zero emissions by 2050.
 - A new [database estimating the cost of transport for 200+ countries](#) and covering the main modes of transport, such as sea, air, rail, and land. This dataset can be used for assessing the impacts of future (climate) policies.
- **Capacity building.** This activity briefed IMO member states on carbon pricing applied to maritime transport and supported academic training on the subject provided to government officials from more than 20 developing countries, of which more than half were small island developing states or least developed countries. This was supported by consultation and outreach activities, especially to small island developing states and least developed countries, promoting effective and equitable policies to reduce greenhouse gases from ships.

PARTNERS

This engagement is led by the Transport practice of the World Bank. PROBLUE support has mobilized further support from the Public Private Infrastructure Advisory Facility (PPIAF) and the Partnership for Market Implementation (PMI). On the ground, close collaboration with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Council for Science and Industrial Research (CSIR), the Presidency of South Africa, and the International Finance Corporation (IFC) of the World Bank Group contributed to the success of the engagement in South Africa.