SEI Stockholm Environment Institute

Global Shipping Watch

Big data to help decarbonize maritime shipping

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What is Global Shipping Watch?

Global Shipping Watch is an open access demonstration platform that links maritime emissions with the specific supply chain actors connected to them. It enables traders, carriers, consumers and researchers to produce data-driven analysis of existing bottlenecks and barriers for decarbonizing maritime shipping.

Global Shipping Watch demonstrates the feasibility and disruptive applications of a ground-breaking approach that matches detailed cargo records and the movements and operations of vessels, as obtained remotely from the AIS system of cargo vessels. By doing so, it is possible to find out what a given cargo ship carries, which companies own the cargo, or which commodities and products are linked to shipping emissions on specific routes.

The initial data release covers the maritime exports and imports of the United States, as well as the exports of countries including Brazil, Chile, Peru and Indonesia, in the year 2019. Global Shipping Watch is expected to successively increase its coverage, in terms of geography and time periods.

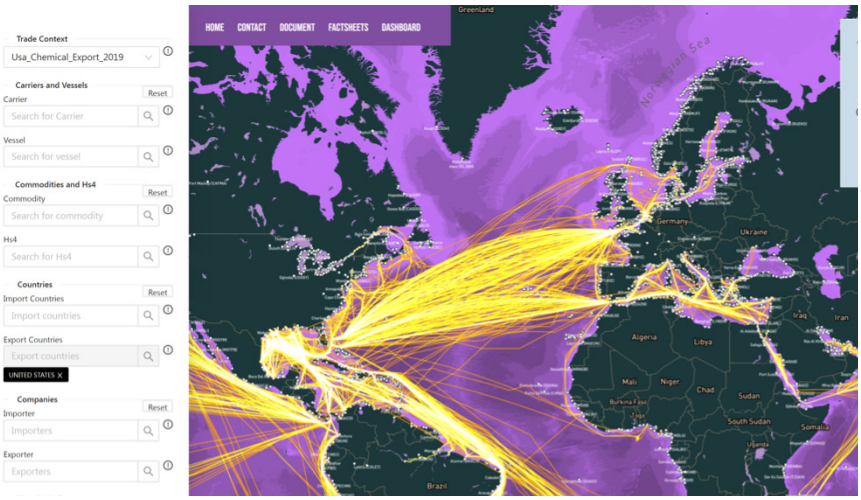


IMAGE (ABOVE): NARVIKK © GETTY

Why Global Shipping Watch?

Around 80% of the world's trade is carried by sea. While maritime shipping is an environmentally efficient means of transport per unit of cargo, the sheer volume of maritime trade results in nearly 3% of the world's greenhouse gas emissions – more than the aviation sector. Maritime shipping also contributes disproportionately to air pollution in many densely populated coastal areas – a global health issue of increasing concern.

The International Maritime Organization and several companies have ambitious commitments to curb shipping emissions and reduce fuel consumption. But this transition can only succeed if all actors in the global supply chain, from the maritime sector itself to governments, finance institutions, retailers, traders and consumers, have access to better data and emissions monitoring capabilities.

The 2021 Suez Canal obstruction illustrates the need to obtain data on cargo and cargo ownership per individual vessel. The associated traffic jam brought uncertainty to international logistics and supply chains.

How does Global Shipping Watch help reduce emissions from shipping?

It has so far been impossible to associate maritime transport emissions to a specific company, traded product, country or consumer choice. This is a major barrier to accurately assessing scope 3 emissions in corporate carbon reporting, and to consumers in understanding the real footprint of their choices.

Global Shipping Watch targets this gap by bringing a new level of analytical depth, accountability and transparency to global maritime shipping and international supply chains. Furthermore, by mapping the role of individual cargo owners – often key traders and retailers in global chains – Global Shipping Watch aims to help bring the maritime shipping sector into broader efforts to make supply chains more sustainable, from production to consumption.

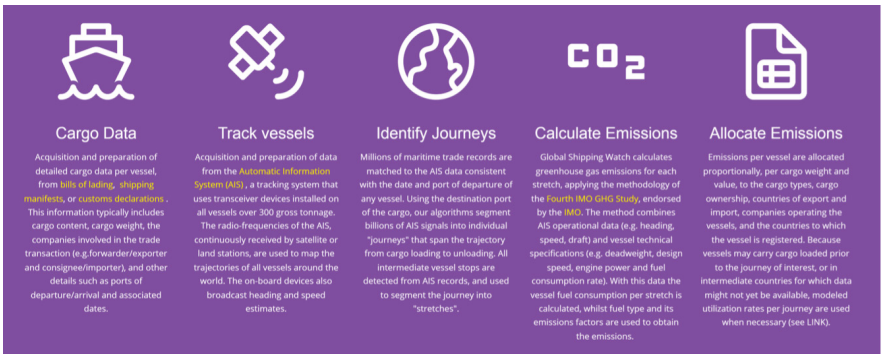
Global Shipping Watch can specifically support efforts to decarbonize the shipping sector by:

- setting baselines; benchmarking the performance of carriers, vessels, export companies, countries and commodities; and optimizing logistics and cost-efficiency analyses (e.g. carbon emissions plus financial performance)
- offering standardized and low-cost carbon reporting of shipping emissions by traders, carriers and countries, including of scope 3 emissions
- improving carbon footprinting analyses, including for life-cycle analyses.

What is unique about GSW technology and capabilities?

GSW links detailed cargo data and emissions per vessel, at scale. The underlying peer-reviewed methodology (Schim van der Loeff et al. 2018) consists of five steps:

1. Detailed cargo data per vessel is acquired and standardized.
2. Billions of data points from the Automatic Information System (AIS) – a global tracking system that uses transceiver devices installed on all vessels over 300 gross tonnage – are matched to the cargo data by looking for common recorded departure port, date and destination, for each and all vessels.
3. Our algorithms segment the AIS signals into individual "journeys" that span each vessel trajectory from cargo loading to download. For each vessel journey emissions are calculated using the methodology of the Fourth IMO Greenhouse Study, endorsed by the International Maritime Organization (IMO).
4. The method (IMO 2021) combines AIS operational data (e.g. heading, speed, draft) and vessel technical specifications (e.g. deadweight, design speed, engine power and fuel consumption rate).
5. Finally, emissions are allocated proportionally, per cargo weight and value, to the cargo types, cargo ownership, countries of export/import, companies operating the vessels, and countries of flag.



How to access Global Shipping Watch data

Global Shipping Watch can be accessed at: globalshipping.watch

- The Dashboard is open and free to access. Users can query data on the cargo and the emissions associated to different products, companies, countries and carriers. The information can be downloaded as a table. This information is relevant to users interested in carbon footprints and the emissions benchmarking of corporations and countries.
- The Demo Map is currently available only on request. Access is limited because of the sensitivity of this data: only information for one vessel or journey can be obtained per individual query. The Demo Map provides free access to part of the maritime data available in the Global Shipping Watch database, including at the vessel and vessel journey levels. Information cannot be downloaded. This information is relevant to users interested in maritime sector emissions and logistics, as well as for those interested in trade intelligence applications.
- The Factsheets are open and free to access. They provide a brief summary, per country of interest, of the exports/imports and emissions available in Global Shipping Watch.

The online platform cannot capture in a one-stop-shop the full detail of our database, which includes, for example, cargo descriptions per container, or hundreds of thousands of company names involved in global trade. SEI and relevant research partners will analyze the complete data to gain insights into maritime shipping decarbonization and more sustainable global supply chains. We welcome and invite collaboration to make the best use of this data.

What is next?

The current alpha release aims to demonstrate the power and applications of the underlying methodology in order to catalyze uptake by the private and public sectors.

With this pilot platform we also seek support to enable us to successively increase the geographical and temporal coverage of the platform, to include most of global maritime trade, while providing concrete applications and use cases.

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