



Methodological Note - August 2026

Shipping decarbonisation in Singapore

Scope, data and methodology for the dashboard

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T&E

1. Purpose and scope

This note describes the sources, processing steps and analytical assumptions used to produce the indicators, charts and observations in the dashboard. It combines public statistics and policy information with T&E analysis of bunker-fuel sales and computed emissions based on real world vessel activity. It is intended to show the scale, composition and recent development of shipping activity and associated emissions linked to Singapore.

Boundary and attribution. Emission estimates produced under any boundary do not constitute an attribution of legal, regulatory, economic or political responsibility to Singapore. The estimates are shown to illustrate the scale of the shipping decarbonisation challenge and compare established emissions accounting methods.

2. Contextual indicators, map and policy timeline

Headline indicators on shipping's economic contribution, vessel calls, cargo throughput and port connectivity use the latest publicly available information from Singapore government and port sources at the time of publication. The shipping-activity map was developed using Maritime and Port Authority of Singapore (MPA) publications, relevant Singapore legislation and other publicly available port information to illustrate principal ports, anchorages, ferry services and traffic patterns. Locations and routes are indicative and are not intended for navigation or as a determination of port, territorial or jurisdictional boundaries.

The policy timeline summarises selected milestones from the [International Maritime Organization](#), the [European Union](#) and [Singapore](#). It is a contextual chronology, with legal and policy descriptions simplified for readability.

3. Emission estimates in the dashboard

Charts based on vessel activity use processed 2024 outputs from T&E's Shipping Emissions Analysis (SEA) model. The SEA model combines third-party Automatic Identification System (AIS) data with vessel characteristics from commercial ship registers and reconstructs vessel movements, energy demand and emissions. The dashboard filters and aggregates those outputs for the boundaries below.

Dashboard chart	Method and boundary
Country-attributed emissions	EU ETS-style attribution for vessels $\geq 5,000$ GT: 50% of emissions from an international voyage leg is allocated to its origin and 50% to its destination; domestic legs and port stops are allocated in full.
Emissions by vessel type	Singapore-linked voyage legs are grouped by vessel type

	and their modelled emissions summed.
Voyage-linked emissions	Modelled voyage legs between Singapore and the vessel's previous or next recorded port call are grouped by the non-Singapore endpoint. Port-stop records are excluded.
Emissions by operational activity	Modelled vessel-hours within Singapore's geographic scope, defined using third-party maritime boundary data incorporated into the SEA model, are classified as at berth, port arrival/departure, domestic activity or EEZ transit. Dry-dock activity is excluded.
Bunker fuel-related emissions	Annual marine fuel sales are multiplied by representative tank-to-wake emission factors, and compared with Singapore's reported national greenhouse gas (GHG) emissions. Upstream fuel-production and supply emissions are excluded.

4. Processing of vessel-based charts

Unless stated otherwise, vessel-based charts use processed 2024 voyage and hourly activity data from T&E's SEA model and cover ships of 400 GT and above.

Singapore-linked voyage estimates cover the voyage leg between Singapore and the vessel's previous or next recorded port call, including emissions occurring outside Singapore waters. These connections represent vessel movements and should not be interpreted as complete trade routes or as the origin or destination of the cargo carried.

The geographic boundary and operational states reflect the third-party data and model classifications used in T&E's SEA model. They do not constitute direct observations or an independent legal determination of Singapore's territorial sea, exclusive economic zone or other maritime jurisdiction.

5. Bunker-fuel chart and assumptions

The bunker-fuel chart uses monthly marine bunker sales published by MPA. Reported quantities were harmonised across fuel categories and reconciled with published totals.

Bunker-sales-associated emissions are estimated by applying representative tank-to-wake emission factors to reported fuel quantities. Bio-blended fuels are assumed to contain 24% biofuel on an energy basis, consistent with B24 blends traded in Singapore during the period analysed. LNG emissions assume an equal split between low- and high-pressure two-stroke dual-fuel engines. Detailed blend composition and engine technology data were unavailable at the time of analysis; these assumptions were therefore applied.

6. Quality assurance and limitations

Quality-assurance checks covered data completeness, classification, calculations and reconciliation with source totals.

- **Independent analytical product.** The dashboard is not Singapore's national greenhouse-gas inventory, an official administrative dataset, verified operator reporting, or a regulatory or compliance accounting framework.
- **Third-party data and modelling uncertainty.** Results are modelled estimates and are subject to limitations in the underlying data, classifications, emission factors and SEA model assumptions.
- **Comparability.** Definitions, periods and boundaries differ across charts. Results should only be compared where these align and should not be summed across different boundaries.
- **No attribution of responsibility.** Vessel connections, geographic inclusion, country attribution and fuel sales do not establish cargo ownership, legal jurisdiction or responsibility for emissions.
- **Revisions.** Results may be revised as underlying data or methodologies are updated.

Further information

Riza Ahsim

Data Analyst

riza.ahsim@transportenvironment.org

www.transportenvironment.org
