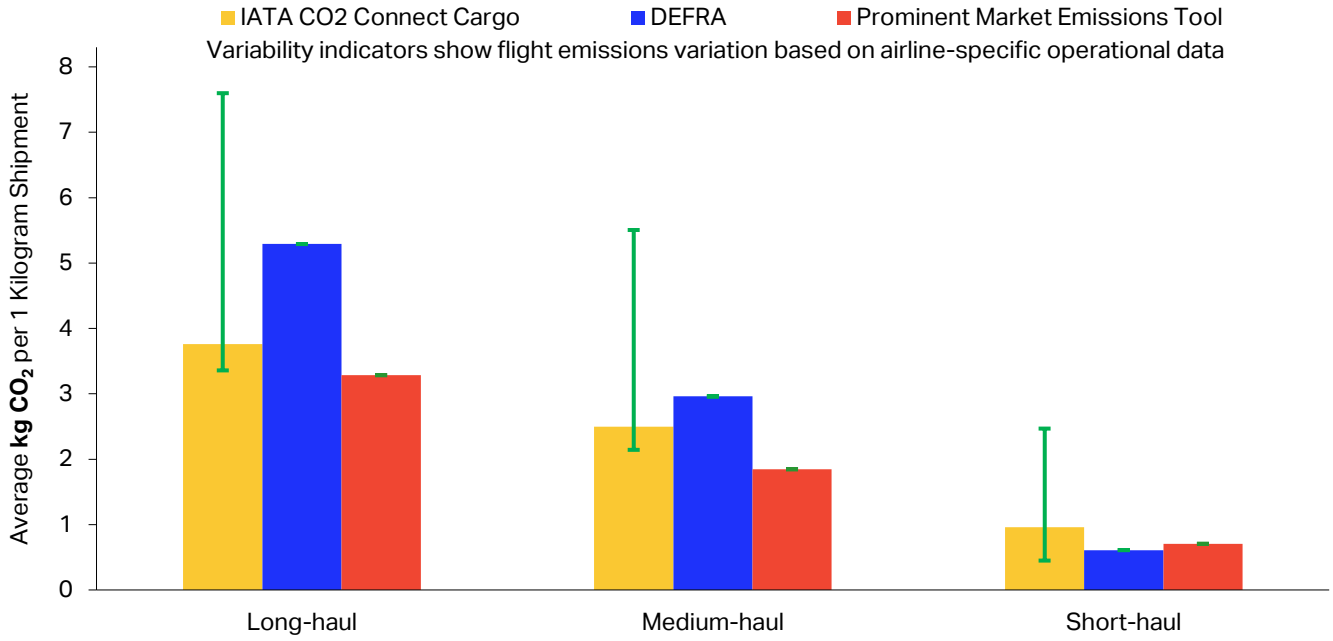
Chart of the Week

24 April 2026

Understanding Variability in Air Cargo Emissions Tools

Different emissions calculators, different carbon footprint of air cargo



Source: IATA Sustainability and Economics.
Note: Average emissions per 1 kilogram shipment from various calculators for all scheduled freighters operating turnaround flights on the same select route in Q1 2026. To enable comparison, the original calculator emissions estimates were re-calculated using the tank-to-wake emissions factor of 3.16.

- There are significant discrepancies in the flight emissions data available to shippers, depending on the emissions calculator used. The CO_2 emissions generated from shipping cargo by air require information on the amount of fuel consumed on the route, the load factor of the flight, and the type of freighter used.
- Most calculators rely on estimations of this information. Estimations are generated by entering various hypotheses into theoretical models. This is a most valid approach for research purposes but wholly inadequate for reporting purposes. Sometimes industry averages are used as proxies for observed data. This can at best be used for comparison with other industries' averages, for instance, but not for reporting purposes.
- To report actual emissions from a specific shipment, only observed data is relevant, providing information regarding the aircraft's actual fuel burn, the load factor, and the aircraft model. Once fuel burn has been estimated or observed, the flight's CO_2 emissions can be calculated by applying an emissions factor.
- Airlines operating on the same route can exhibit materially different emissions outcomes depending on aircraft efficiency and load factors (as illustrated in the chart's variability indicators). Consequently, airline-specific emissions estimates show substantial variation when based on operational data. Airlines reporting higher load factors typically achieve lower emissions per kilogram of cargo. Calculators that assume a universal load factor fail to reflect the true airline utilization of individual freighters on specific routes.
- Inconsistent emissions data can undermine trust and complicate decision-making. Greater methodological alignment and the use of accurate, observed, and airline-specific operational data would significantly improve transparency, comparability, and confidence in freight emissions reporting.

IATA Sustainability & Economics
economics@iata.org