



CO₂ EMISSIONS FROM AIR TRANSPORT: A NEAR-REAL-TIME GLOBAL DATABASE FOR POLICY ANALYSIS

Second technical workshop on nowcasting in international organizations

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- Motivation and background
- Methodology
- Results
- Conclusion and way forward



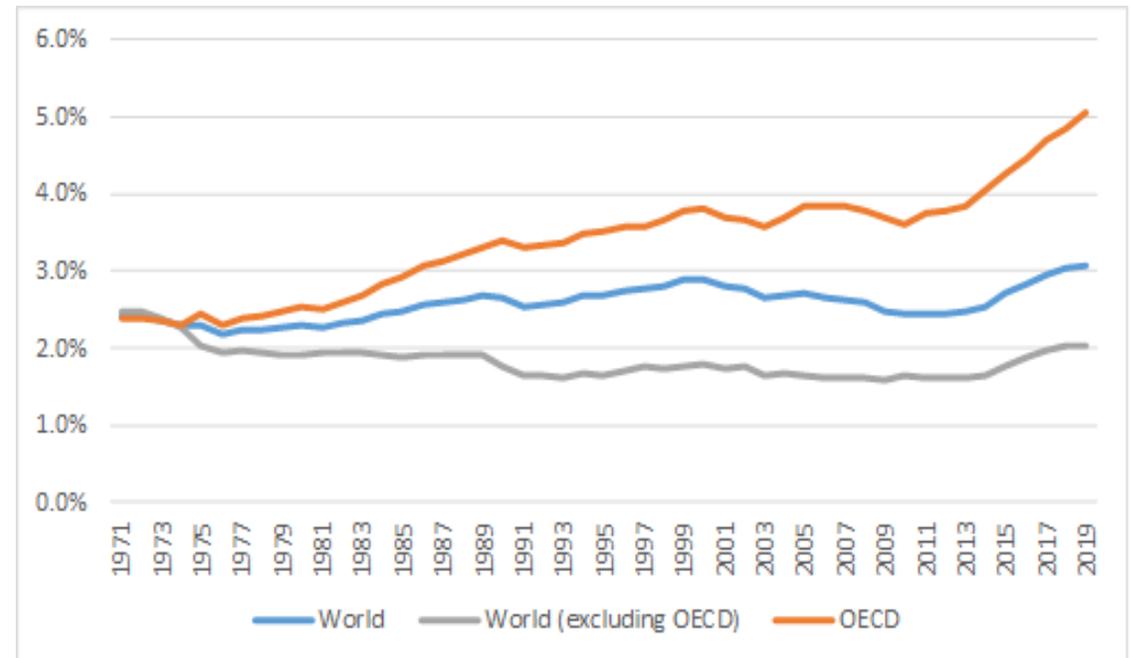
MOTIVATION AND BACKGROUND



Air transport accounts for a significant and growing share of overall CO₂ emissions

- » **In 2019** (just before COVID-19): air transport represented 3% of all energy-related CO₂ emissions at global level, and 5% in OECD countries
- » **Big impact of COVID-19 restrictions** on CO₂ emissions from air transport, but only temporary
- » **2021 projections** by the International Transport Forum (ITF): in the absence of accelerated technological developments and more ambitious policy measures, CO₂ emissions from air transport will start growing again at a rapid pace after the pandemic

Share of air transport in energy-related CO₂ emissions (1971-2019)



Source: International Energy Agency, OECD calcs



Existing official statistics: UNFCCC

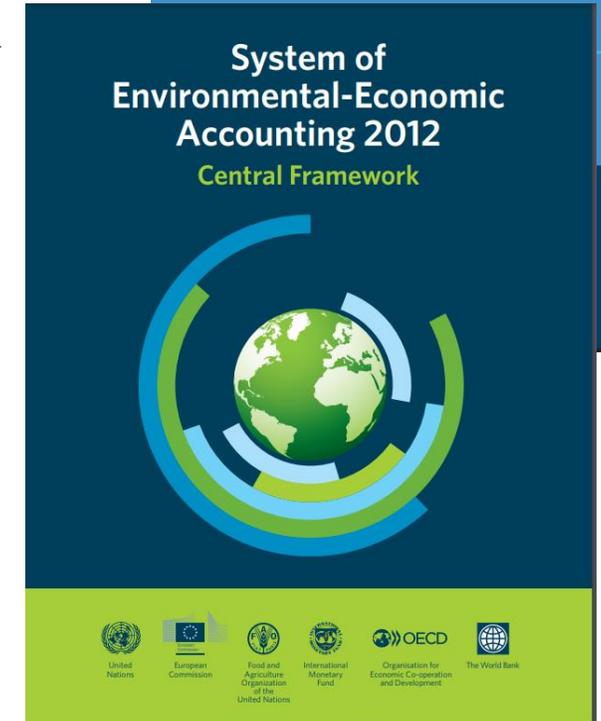
- **UNFCCC inventories**
 - Available at annual frequency for 43 (Annex-I) countries
 - Release date: 16 months after the end of the reference year
 - CO₂ emissions from international flights recorded in *memo items*, and not in national totals
 - Allocation of CO₂ emissions across countries based on where fuel is purchased (departure country of flights in practice)



Existing official statistics: SEEA AEA

System of
**National
Accounts**
2008

- **The SEEA** - endorsed as an international statistical standard by the UN Statistical Commission in 2012, integrates environmental and economic statistics in a consistent framework, aligned with another standard called the System of National Accounts (2008)
- **SEEA Air Emission Accounts (AEAs)**
 - Available at annual frequency for 42, mostly OECD (including EU) countries
 - Release date: 12 months after the end of the reference year at best (EU countries)
 - No distinction between domestic and international flights (both included)
 - Allocation of CO₂ emissions across countries based on the country of residence of airlines

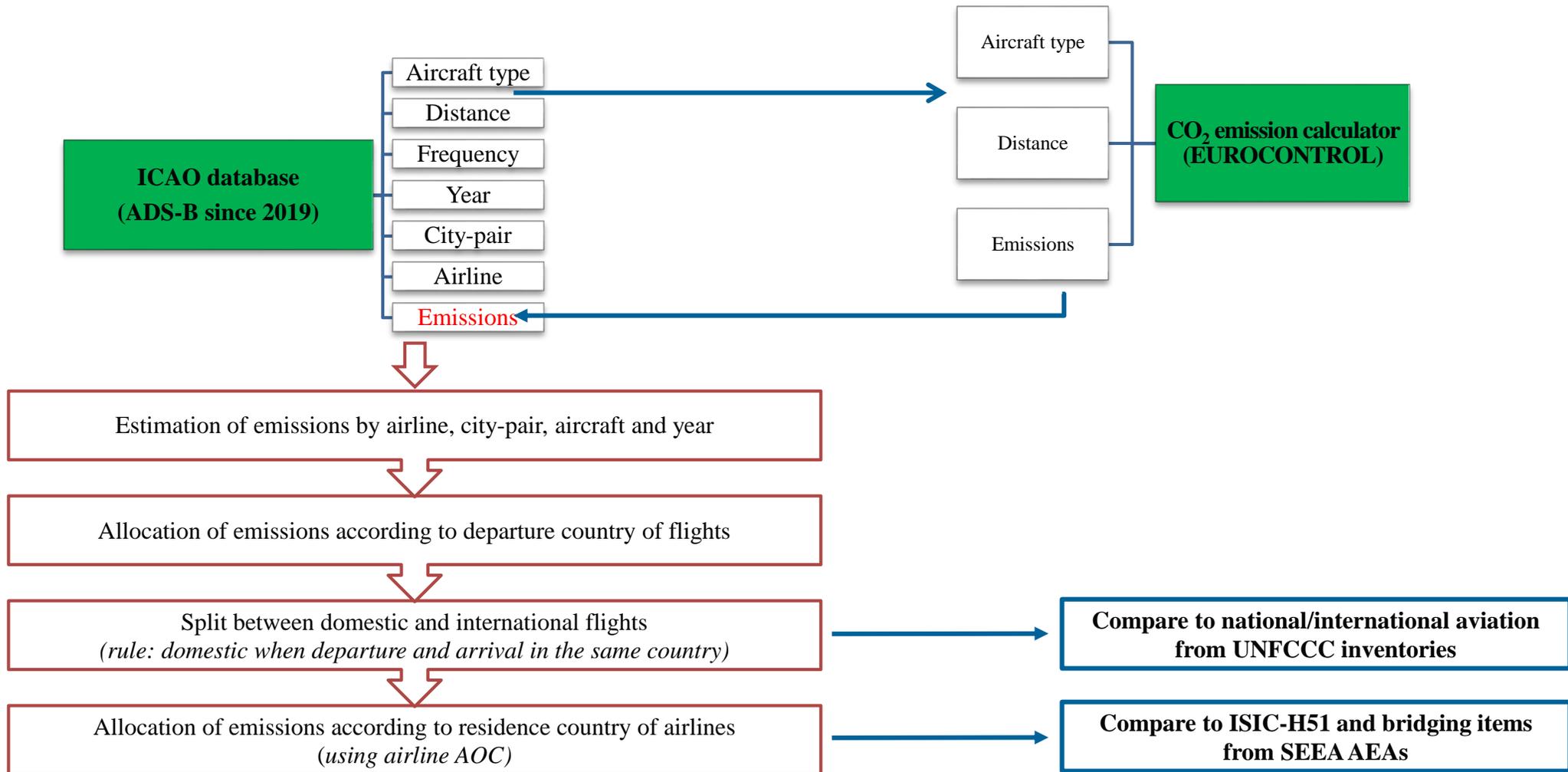




METHODOLOGY

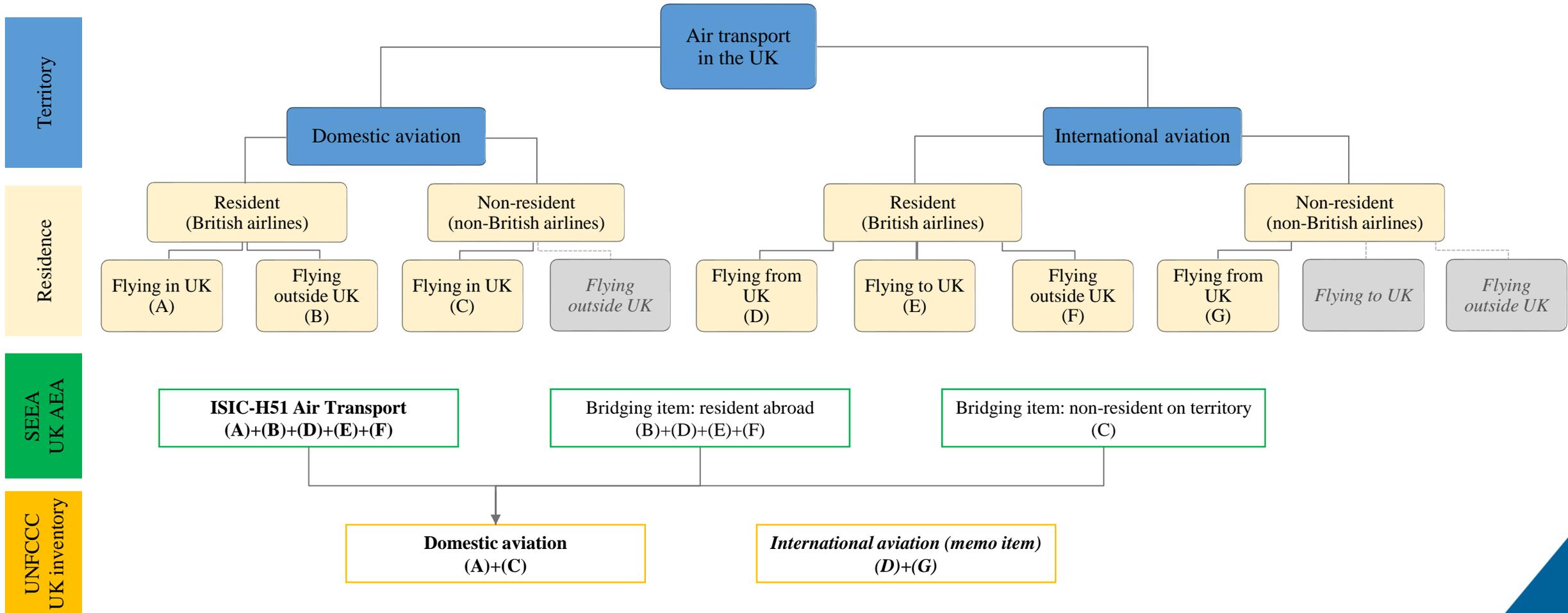


OECD methodology





Allocation of CO₂ emissions across countries: UK example



Notes: The bridging items bridge between the SEEA air emission account total and the UNFCCC inventory total excluding the memo item international aviation. Any additional flight categories in the *residence* section that are neither relevant to the SEEA nor the UNFCCC of the UK are shown in grey in this chart (e.g., a domestic flight outside the UK by a non-resident airline is neither accounted for in the UK air emission accounts nor the UK UNFCCC inventory).

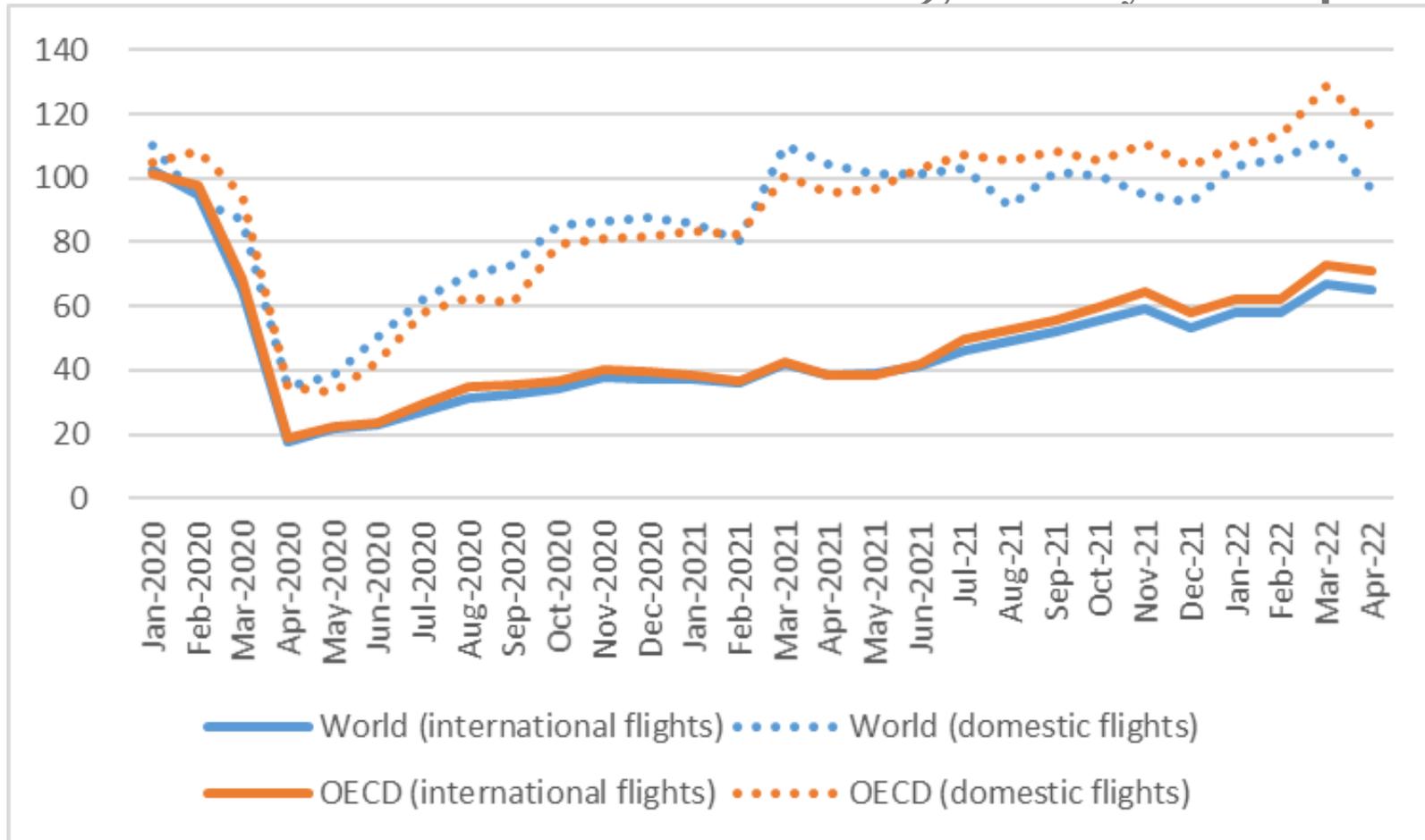


RESULTS



Tracking CO₂ emissions from air transport during COVID-19

CO₂ emissions relative to the same month of 2019, January 2020-April 2022

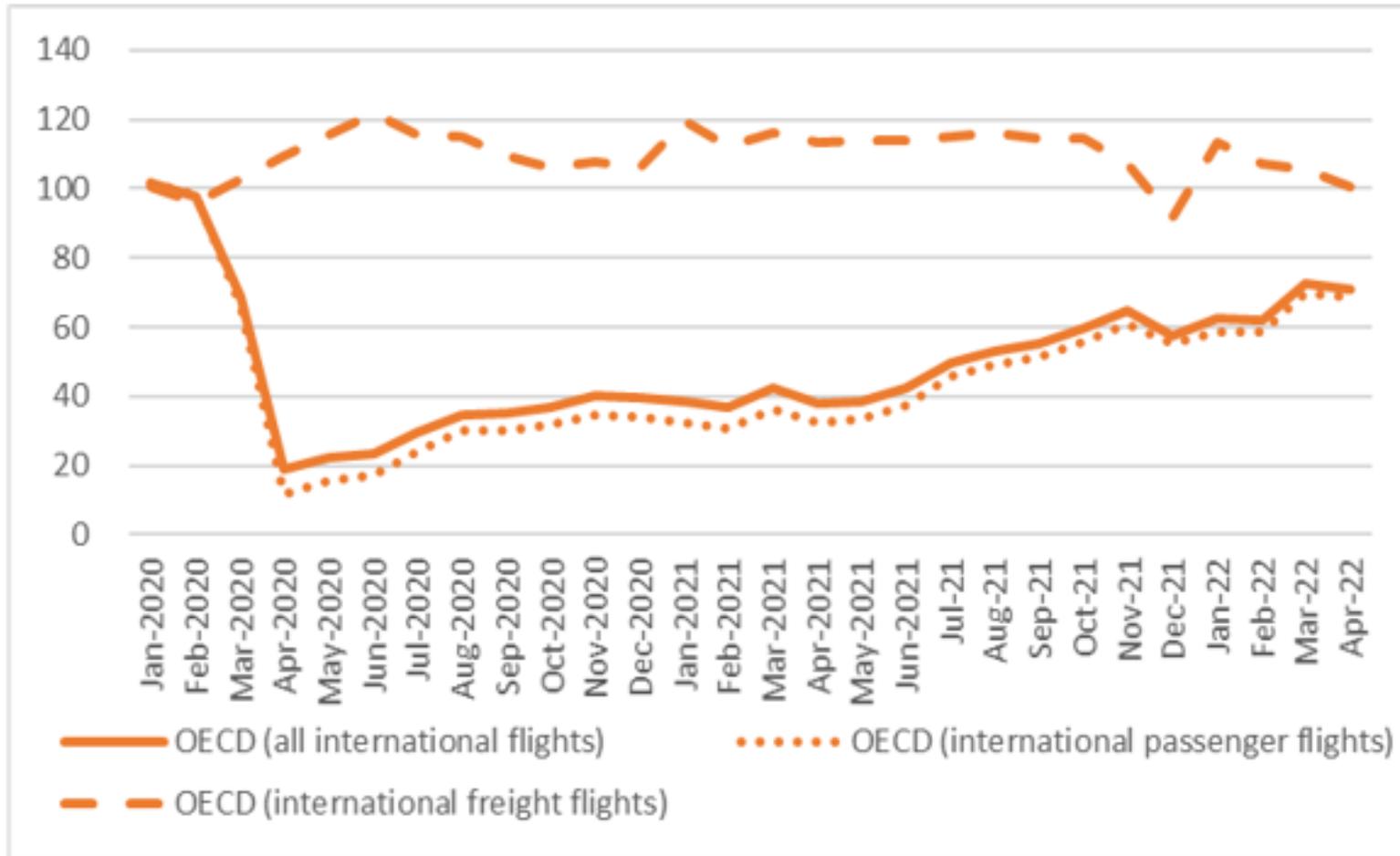


Source: [OECD database on Air Transport CO₂ emissions](#) (database), authors' calculations



Tracking CO₂ emissions from passenger and freight flights

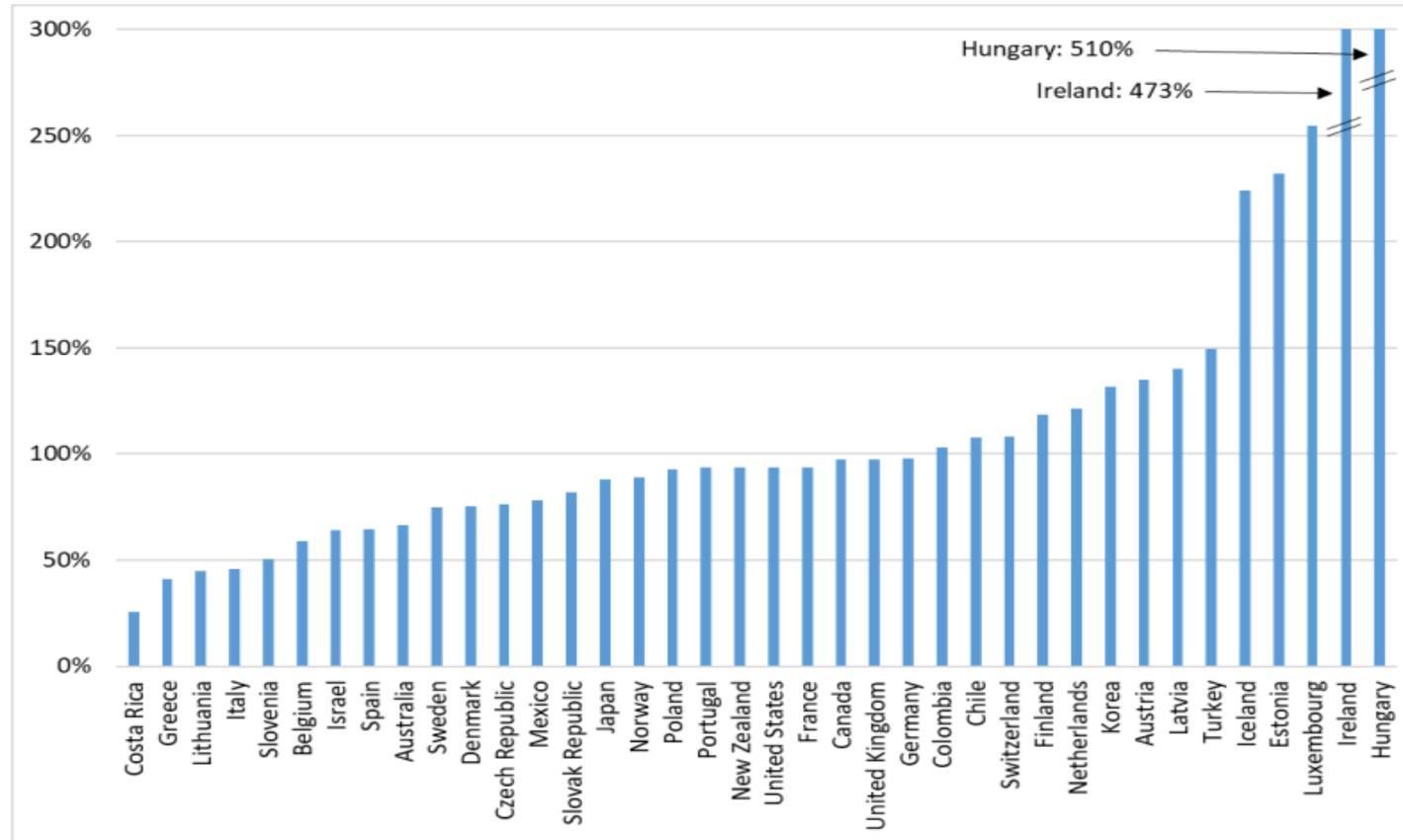
CO₂ emissions relative to the same month of 2019, January 2020-April 2022





National aggregation results comparisons

Ratio of residence- and territory-based emissions, OECD countries, 2019



Note: Residence-based emissions are those generated by resident airlines, wherever they occur in the world. Territory-based emissions are those generated by domestic and international flights taking off from a given country.

Source: [OECD database on Air Transport CO2 emissions](#), authors' calculations.



Main advantages of the OECD database

a. Timeliness and frequency

Estimates currently available up to 1st quarter of 2022, monthly frequency since 2019

b. Near global coverage

186 countries currently covered

c. Consistency across countries for the calculation and allocation of aviation-related CO₂ emissions

2 different allocations across countries are available: territory and residence based

d. Coverage of both domestic and international aviation

e. Granularity

Available breakdowns: domestic/international flights, passenger/freight flights

f. Accuracy

*Bottom-up estimates, based on information on individual flights and aircraft types
Resulting aggregates close to official statistics*



Thank You!

• **OECD Database** available with CO₂ emissions on a monthly, quarterly and annual basis, here:

https://stats.oecd.org/Index.aspx?DataSetCode=AIRTRANS_CO2

• **OECD Working Paper** (March 2022):

<https://doi.org/10.1787/ecc9f16b-en>



OECD Statistics Working Papers 2022/04

CO₂ Emissions from air transport: A near-real-time global database for policy analysis

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