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

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• Motivation and background
• Methodology
• Results
MOTIVATION AND BACKGROUND
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.

Source: International Energy Agency, OECD calcs
• Air Emissions Accounts:
  – Allocation of CO₂ emissions across countries based on the country of residence of airlines

• UNFCCC Inventories:
  – International aviation (memo item)
  – Domestic aviation
METHODOLOGY
For more details on EUROCONTROL’s CO₂ emission calculator: EMEP/EEA air pollutant emission inventory guidebook 2016
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 Working Paper** (March 2022): [https://doi.org/10.1787/ecc9f16b-en](https://doi.org/10.1787/ecc9f16b-en)