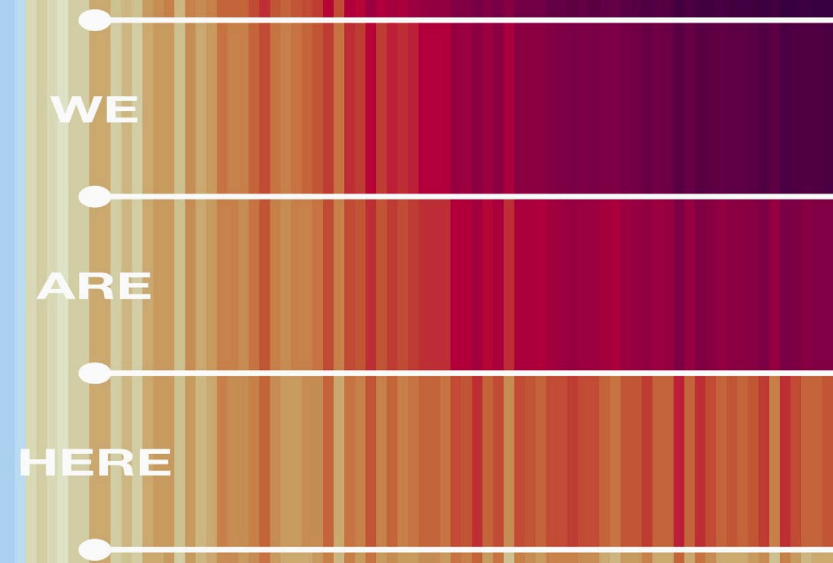




THE EU ETS AND GLOBAL CLIMATE ACTION

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CARBON EMISSIONS, BY COUNTRY

Who emits the most CO₂?

Global carbon dioxide (CO₂) emissions were 36.2 billion tonnes in 2017.

Our World
in Data

Asia
19 billion tonnes CO₂
53% global emissions

North America
6.5 billion tonnes CO₂
18% global emissions

Europe
6.1 billion tonnes CO₂
17% global emissions

China
9.8 billion tonnes CO₂
27% global emissions

India
2.5 billion tonnes
6.8%

USA
5.3 billion tonnes CO₂
15% global emissions

EU-28
3.5 billion tonnes CO₂
9.8% global emissions

Japan
1.2 billion tonnes
3.3%

Saudi Arabia
635 million tonnes
1.8%

Thailand
331M tonnes
0.9%

UAE
223M tonnes
0.6%

Pakistan
199M tonnes
0.55%

Vietnam
194M tonnes
0.54%

Kazakhstan
293M tonnes
0.8%

South Korea
616 million tonnes
1.7%

Taiwan
272M tonnes
0.8%

Iran
672 million tonnes
1.9%

Indonesia
489 million tonnes
1.4%

Malaysia
255M tonnes
0.7%

Kuwait
104M tonnes
0.3%

Uzbekistan
160 tonnes
0.2%

Algeria
151M tonnes (0.4%)

Egypt
219M tonnes
0.6%

South Africa
456M tonnes
1.3%

Nigeria
207M tonnes
0.6%

Brazil
476M tonnes
1.3%

Argentina
204M tonnes (0.6%)

Venezuela
204M tonnes
0.6%

Chile
204M tonnes (0.6%)

Australia
414M t
1.1%

International aviation & shipping
1.1 billion tonnes
3.2%

Africa
1.3 billion tonnes CO₂
3.7% global emissions

South America
1.1 billion tonnes CO₂
3.2% global emissions

Oceania
0.5 billion tonnes CO₂
1.3% global emissions

Shown are national production-based emissions in 2017. Production-based emissions measure CO₂ produced domestically from fossil fuel combustion and cement, and do not adjust for emissions embedded in trade (i.e. consumption-based).

Figures for the 28 countries in the European Union have been grouped as the 'EU-28' since international targets and negotiations are typically set as a collaborative target between EU countries. Values may not sum to 100% due to rounding.

Data source: Global Carbon Project (GCP).

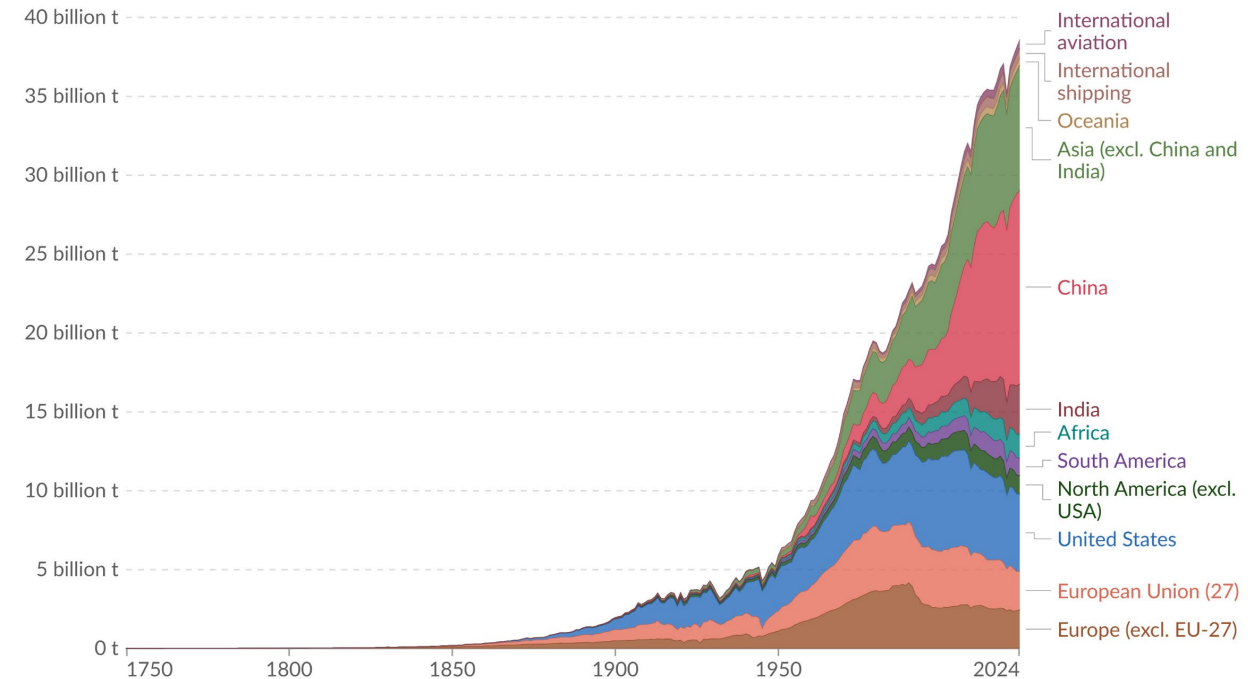
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Annual CO₂ emissions by world region

Emissions from fossil fuels and industry¹ are included, but not land-use change emissions². International aviation and shipping are included as separate entities, as they are not included in any country's emissions.

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in Data



Data source: Global Carbon Budget (2025)

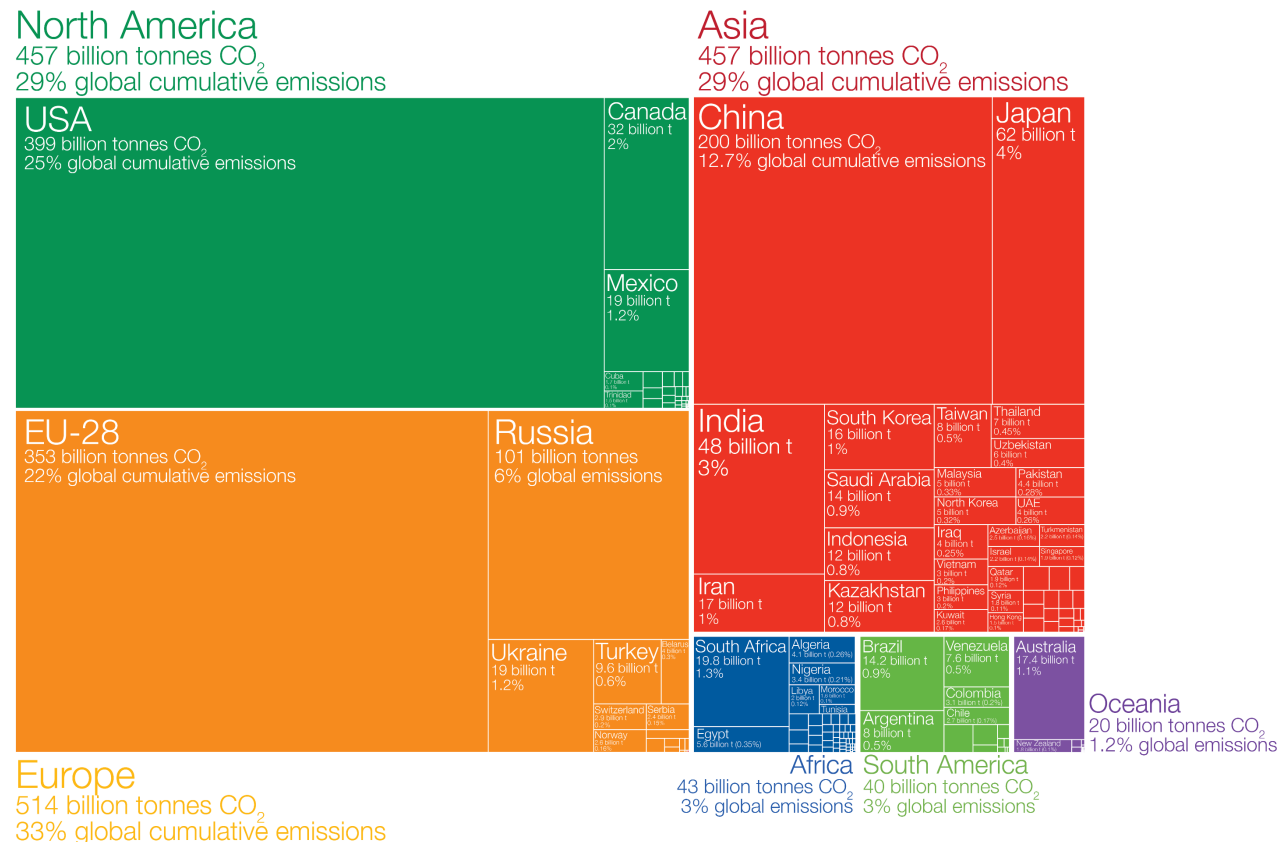
[OurWorldinData.org/co2-and-greenhouse-gas-emissions](https://ourworldindata.org/co2-and-greenhouse-gas-emissions) | CC BY

CUMULATIVE EMISSIONS AND RESPONSIBILITY

Who has contributed most to global CO₂ emissions?

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Cumulative carbon dioxide (CO₂) emissions over the period from 1751 to 2017. Figures are based on production-based emissions which measure CO₂ produced domestically from fossil fuel combustion and cement, and do not correct for emissions embedded in trade (i.e. consumption-based). Emissions from international travel are not included.



CO₂ is a stock pollutant

Europe has contributed
1/3 of global cumulative
emissions

North America and Europe
to 62% of global
cumulative emissions

Figures for the 28 countries in the European Union have been grouped as the 'EU-28' since international targets and negotiations are typically set as a collaborative target between EU countries. Values may not sum to 100% due to rounding.

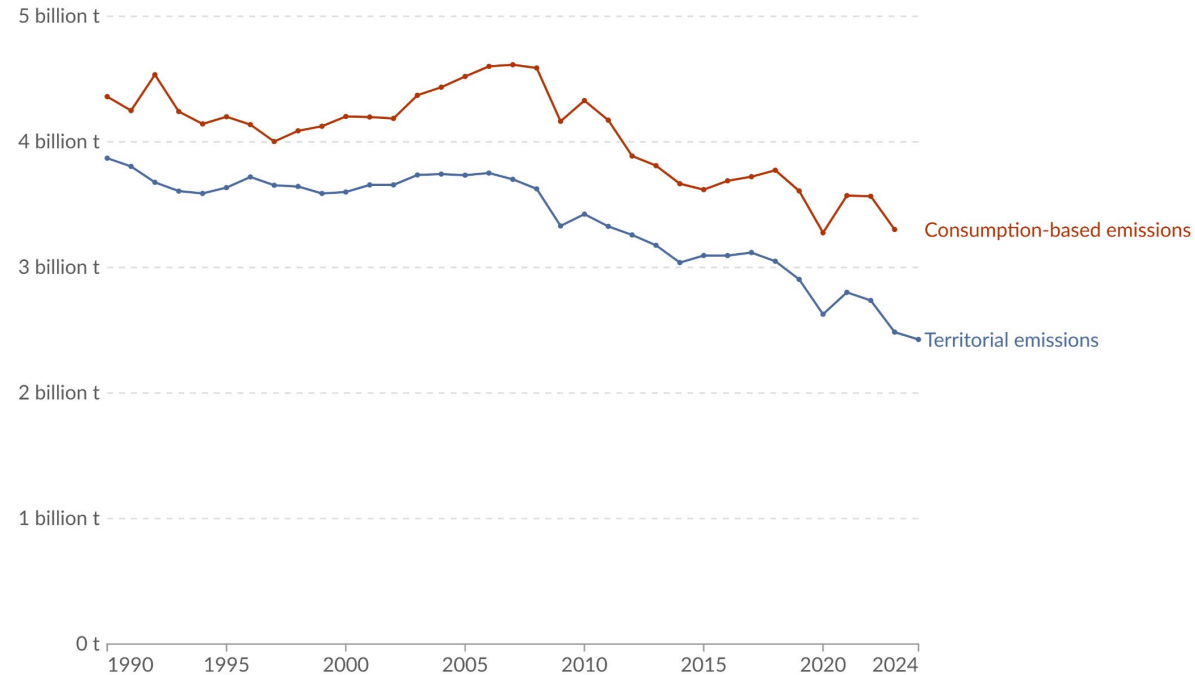
Data source: Calculated by Our World in Data based on data from the Global Carbon Project (GCP) and Carbon Dioxide Analysis Center (CDIAC). This is a visualization from [OurWorldinData.org](https://ourworldindata.org), where you find data and research on how the world is changing.

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TERRITORIAL VERSUS CONSUMPTION-BASED EMISSIONS

Territorial and consumption-based CO₂ emissions European Union (27)

Consumption-based emissions¹ include those from fossil fuels and industry². Land-use change emissions³ are not included.



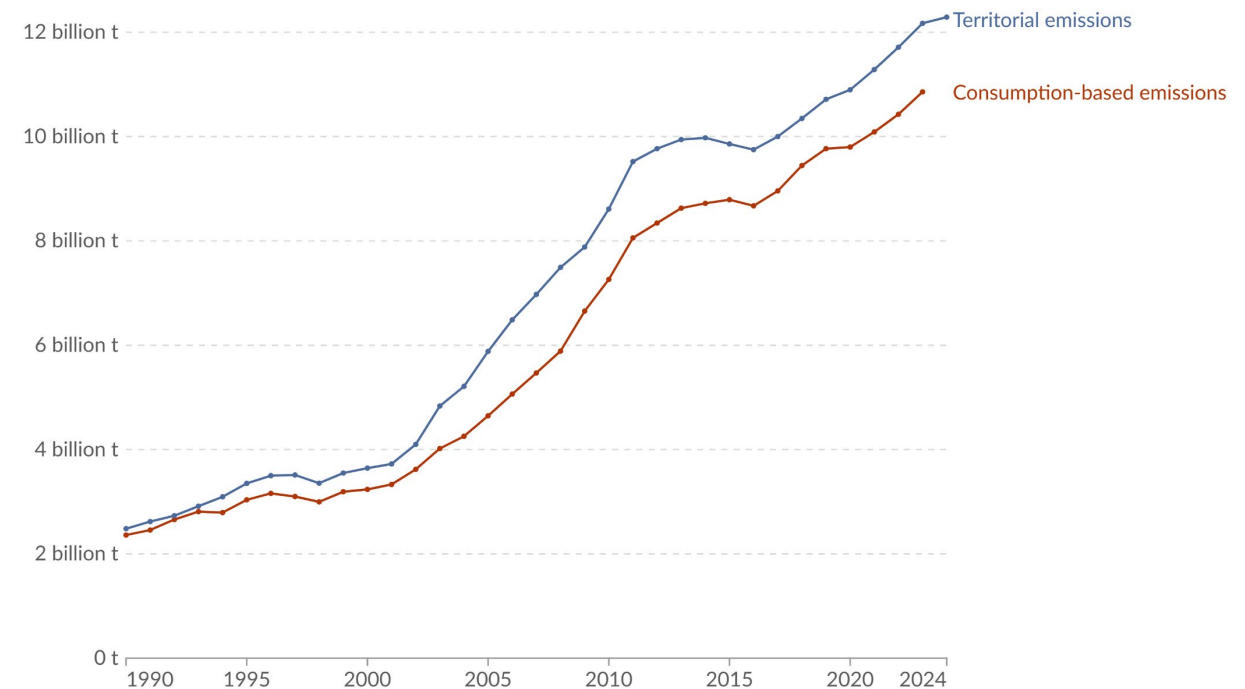
Data source: Global Carbon Budget (2025)

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Territorial and consumption-based CO₂ emissions China

Consumption-based emissions¹ include those from fossil fuels and industry². Land-use change emissions³ are not included.



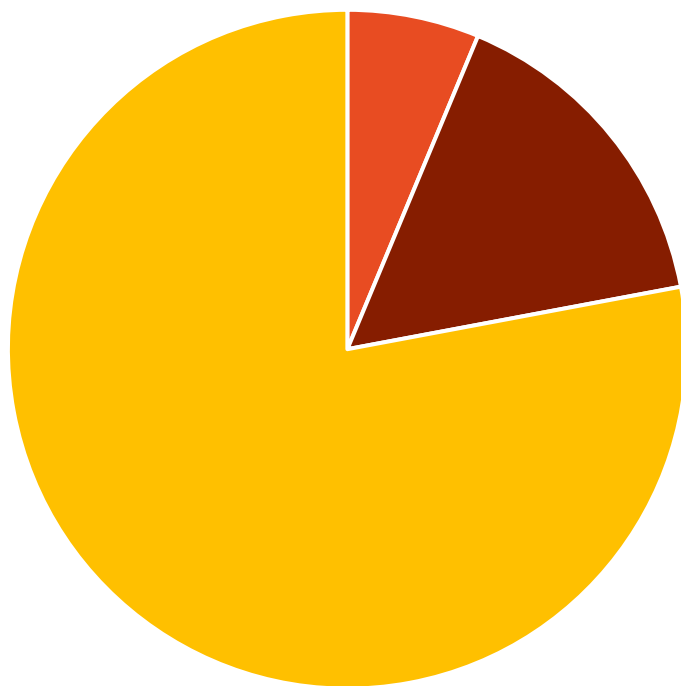
Data source: Global Carbon Budget (2025)

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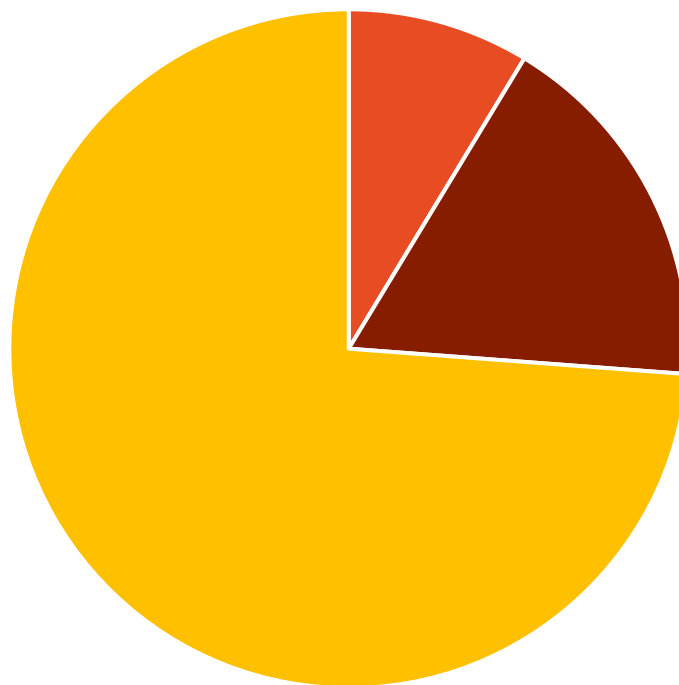
THREE PERSPECTIVES SIDE BY SIDE

Share of (territorial) CO2 emissions



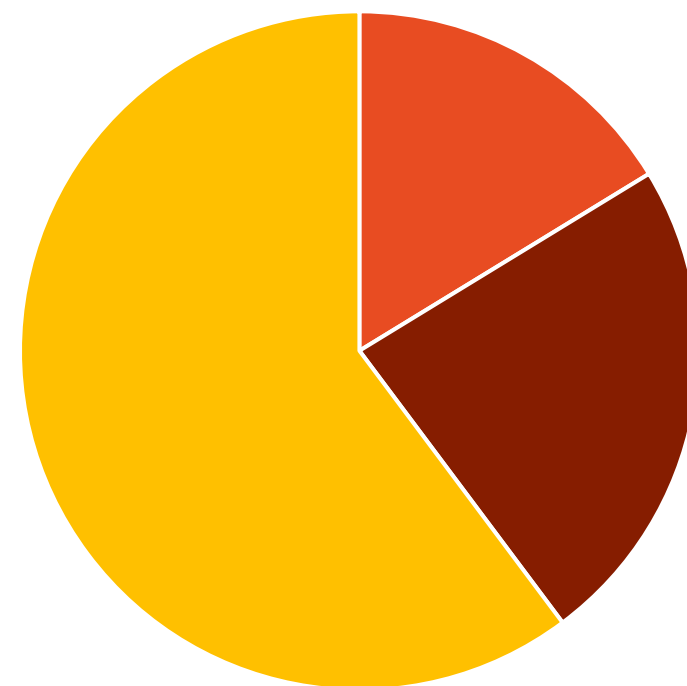
■ EU27 ■ North America ■ RoW

Share of **consumption-based** CO2 emissions



■ EU27 ■ North America ■ RoW

Share of **cumulative** CO2 emissions



■ EU27 ■ North America ■ RoW

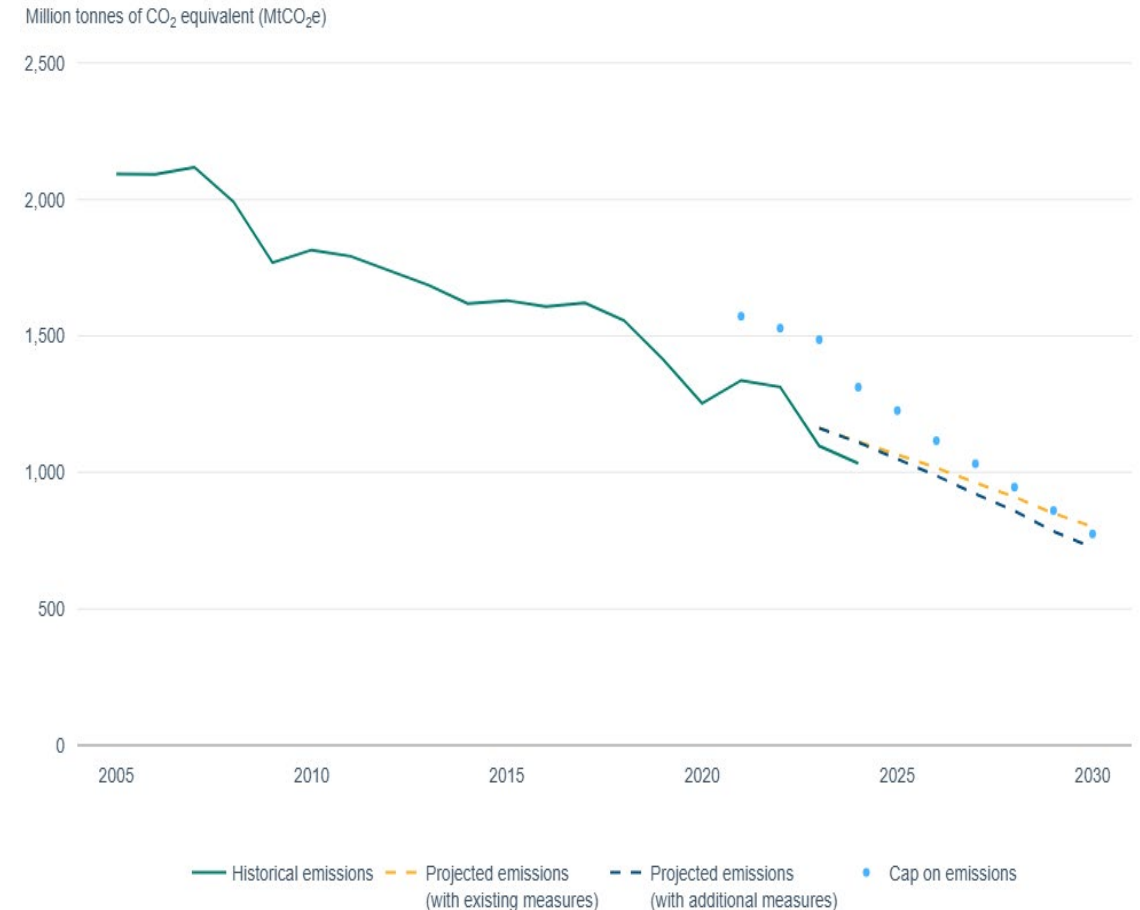
THE EU ETS, A CORNERSTONE TO THE EU CLIMATE POLICY

Emissions capped, cap decreases over time

- Installations must redeem allowances to cover their emissions (polluter-pays-principle)
- Allowances can be bought or sold

Efficiency argument in favor of ETS:

- Firms decide whether to reduce their emissions or buy allowances
- Firms for which it is cheap to reduce their emissions do so



THE RISK OF CARBON LEAKAGE AND FREE ALLOWANCES

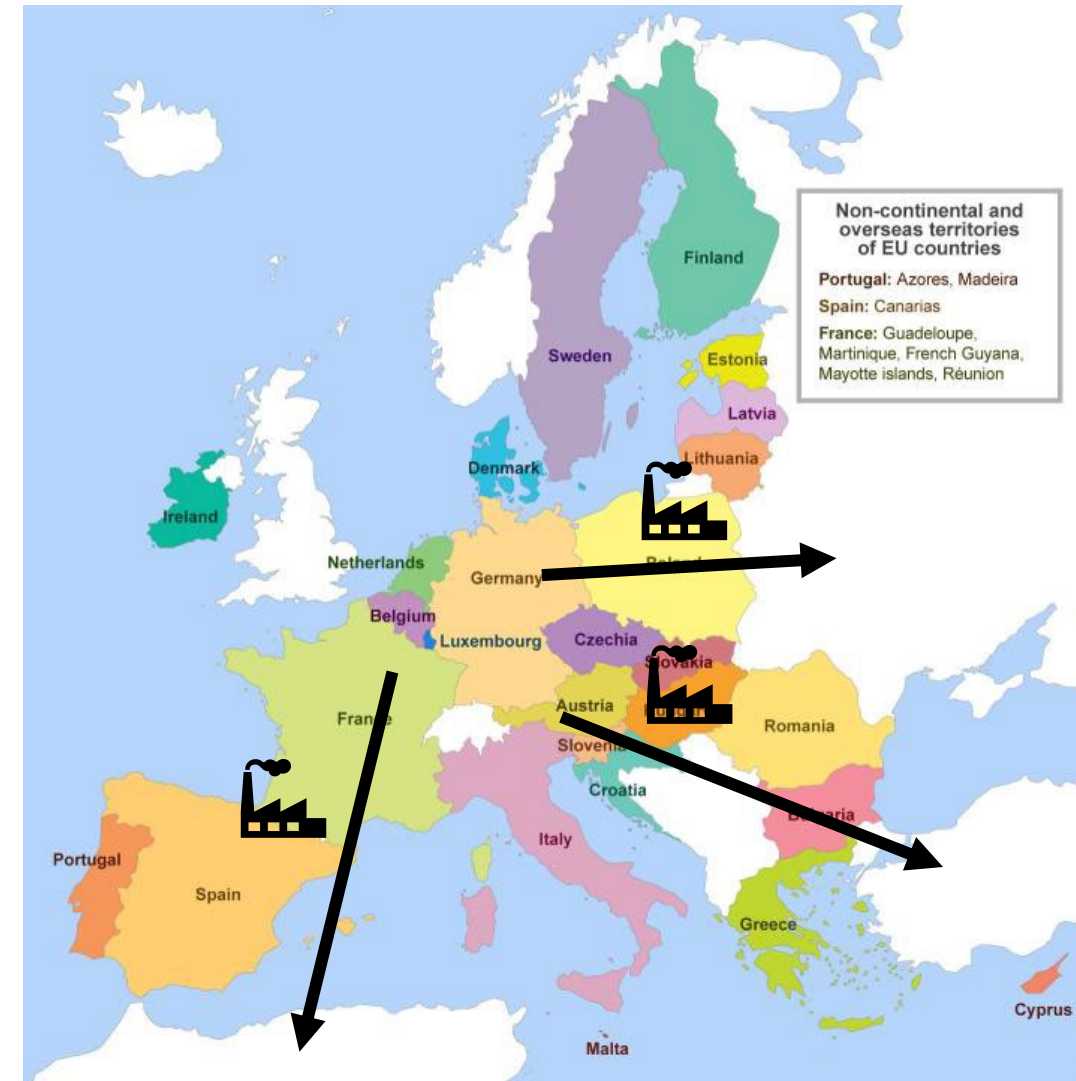
In an open economy, European manufacturers compete with foreign manufacturers.

Cost of allowances creates a cost disadvantage and an incentive to produce outside: **carbon leakage**

Protection built in the system: free allowances for exposed sectors & public subsidies

Consensus opinion among researchers:

- Little evidence of carbon leakage
- Free allowances reduce incentives to abate

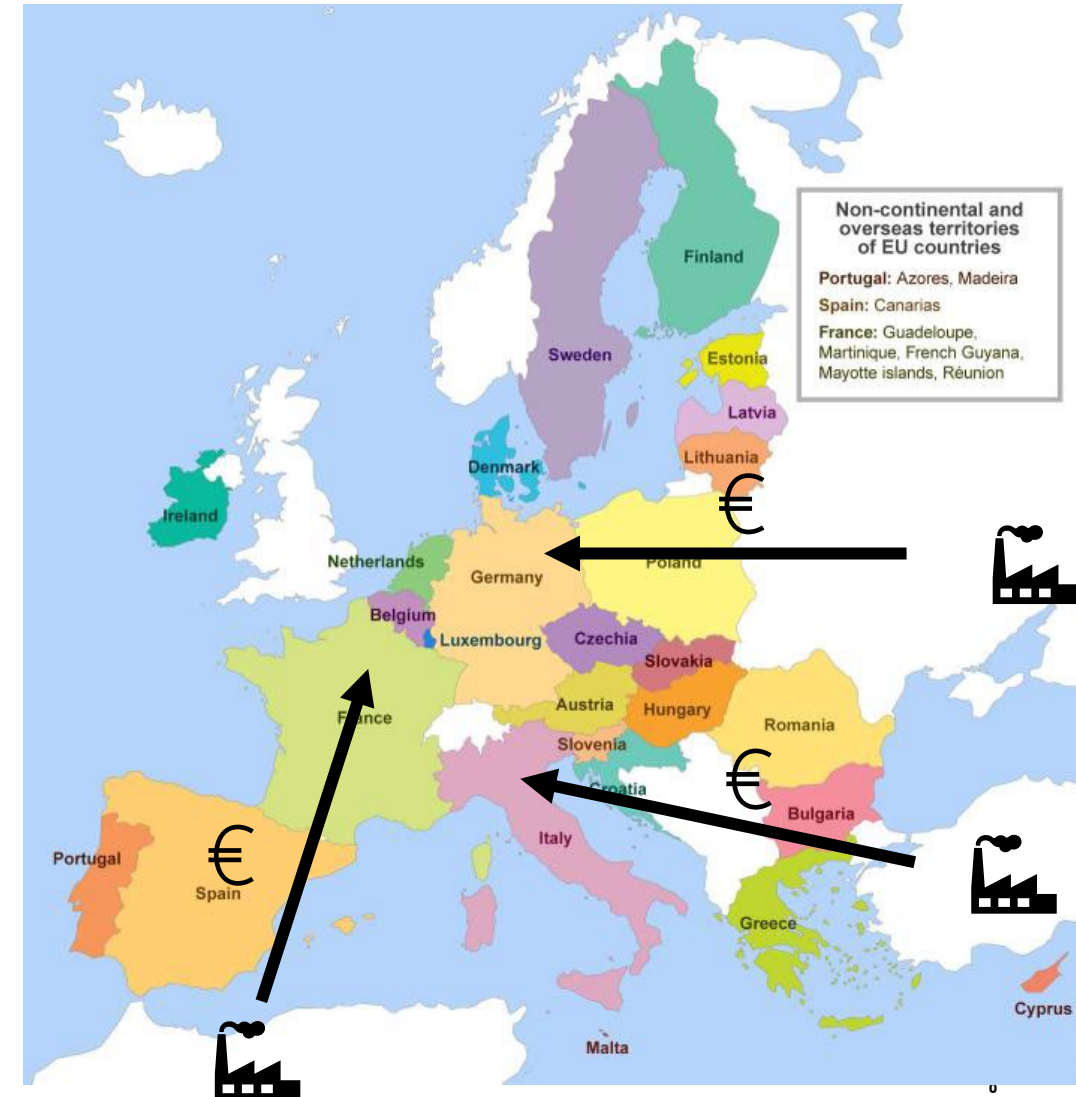


CBAM: ENGAGING THE WORLD THROUGH TRADE

Leverage our internal market to force other countries to put a price on carbon

Carbon-intensive imports required to buy allowances if not taxed in home country: equal playing field

Many teething problems in implementation but has led trade partners to introduce carbon pricing



UNILATERAL VS. MULTILATERAL APPROACHES

Climate change is the one **global** collective action problem: high degree of interest alignment

Paris Agreement provides architecture but is largely voluntary

Potential complements:

- Tiered carbon pricing club with a common CBAM (reciprocity rather than peer pressure)
- Climate-finance coalition to decarbonize the power sector in LDCs (addressing the collective action problem)
- Funding nature restoration through the creation of a public international market for nature shares

