STATISTICS

IMF Climate Change Indicators Dashboard

SEPTEMBER 3, 2021

UNECE Expert Forum for Producers and Users of Climate Change Related-Statistic

Climate Change Indicators Dashboard

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3	Cross-border indicators
4	Financial, physical and transition risk indicators
5	Government policy indicators
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Contributing Institutions

...and other institutions...

Contributing Institutions

| Organization	Source Data	Contribution to Indicator
Organisation for Economic Co-operation and Development (OECD)	• Air Emissions Accounts • Trade in Carbon emissions • Annual National Accounts • Input-Output tables • Inward activity of multinationals by industrial sector • Direct investment positions • Environmentally Related Tax Revenue database	• Annual and Quarterly greenhouse gas (GHG) air emissions accounts • Carbon emissions per million $US of output by industry • CO2 emissions embodied in domestic final demand, production, and trade • Direct investment-related indicators • Carbon footprint-adjusted loans to total loans for deposit takers • Environmental Taxes
International Energy Agency (IEA)	CO2 emissions from fuel combustion	Annual and Quarterly greenhouse gas (GHG) air emissions accounts
World Bank Group	• Global Financial Development Database • Preparedness of Countries to Low-Carbon Transition (Chapter 5). Peszko, Grzegorz et al. 2020	• Non-life insurance penetration • Preparedness of countries for a low-carbon transition
United Nations	• National Inventory Submissions to the UN Framework Convention on Climate Change (UNFCCC, CRF tables) • COMTRADE Harmonized Commodity Description and Coding System (HS) 2017	• GHG emissions national inventories by source • Trade in environmental goods
INFORM* / European Commission	INFORM Risk	Climate-driven INFORM Risk

* INFORM is a collaboration of the Inter-Agency Standing Committee Task Team for Preparedness and Resilience and the European Commission

Contributing Institutions

Organization	Source Data	Contribution to Indicator
Food and Agriculture Organization (FAO)	Data are based on the publicly available Global Surface Temperature Change (GISTEMP) data distributed by the National Aeronautics and Space Administration Goddard Institute for Space Studies (NASA-GISS).	Annual Mean Global Surface Temperature
National Oceanic and Atmospheric Administration (NOAA)	• Monthly CO2 concentrations measured at Mauna Loa • Satellite Altimetry	• Monthly Atmospheric Carbon Dioxide concentrations • Change in mean sea level [mm]
University of Louvain /Centre for Research on the Epidemiology of Disasters	The Emergency Events Database (EM-DAT) Only climate related disasters (Wildfire, Storm, Landslide, Flood, Extreme Temperature, Drought, Fog, Wave Action and Glacial Lake Outburst) are covered	Climate related disasters frequency
Refinitiv *	Aggregated from bond-by-bond nominal issuances data	Green Bonds

* Refinitiv is a commercial data provider

Economic Activity and Climate Indicators
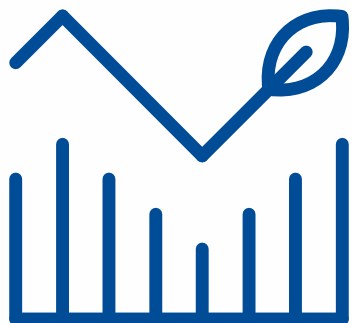
- **Economic Activity Indicators**
  - Greenhouse Gas Emissions
    - Quarterly Greenhouse Gas Emissions by activity and for households
    - National Greenhouse Gas Emissions Inventories and National Mitigation Targets
  - CO_2 Emissions per US$ of Output

- **Climate Indicators**
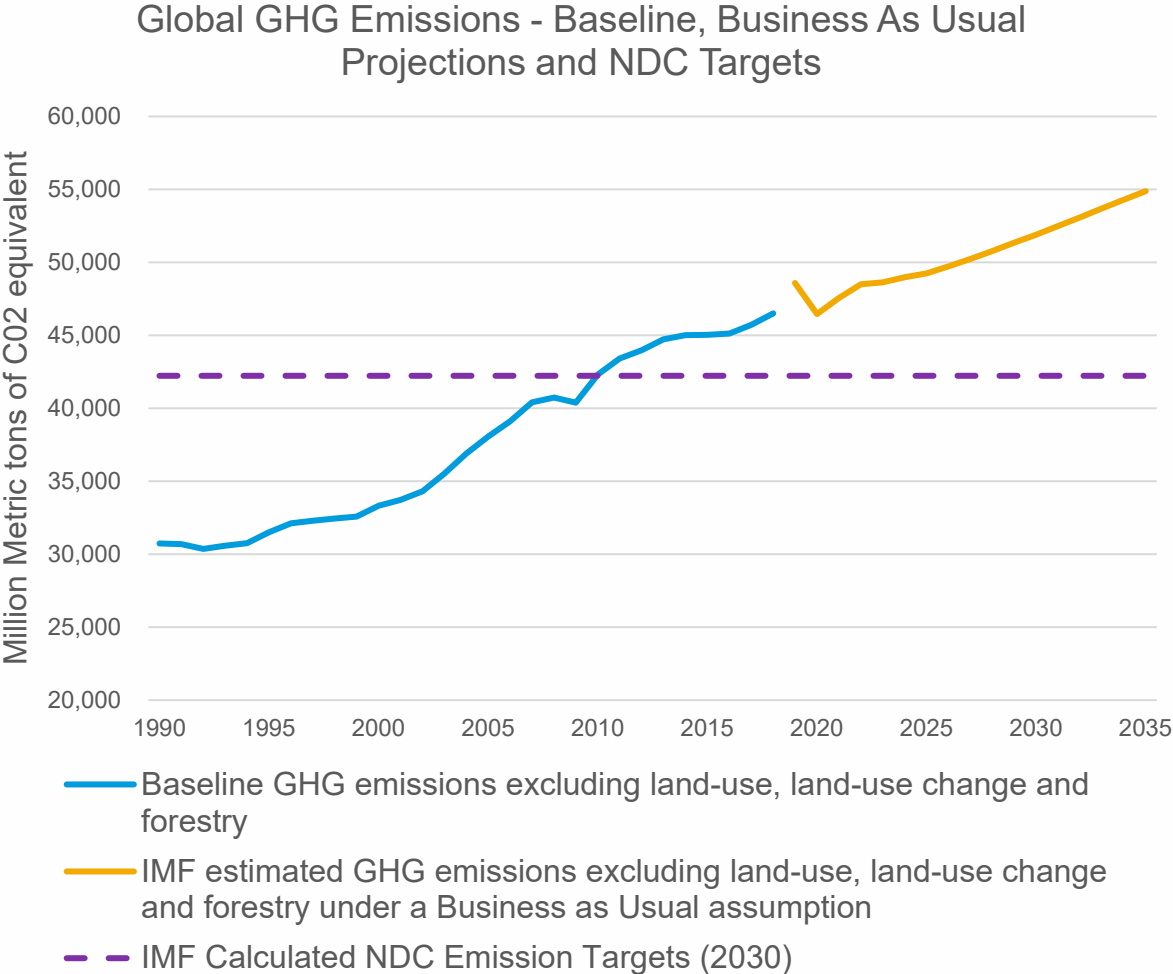 - Global temperatures, sea levels and CO_2 atmospheric concentrations

Quarterly Greenhouse Gas Emissions

COVID-19 resulted in a large decline in GHG emissions worldwide, specifically the second and fourth quarter of 2020.
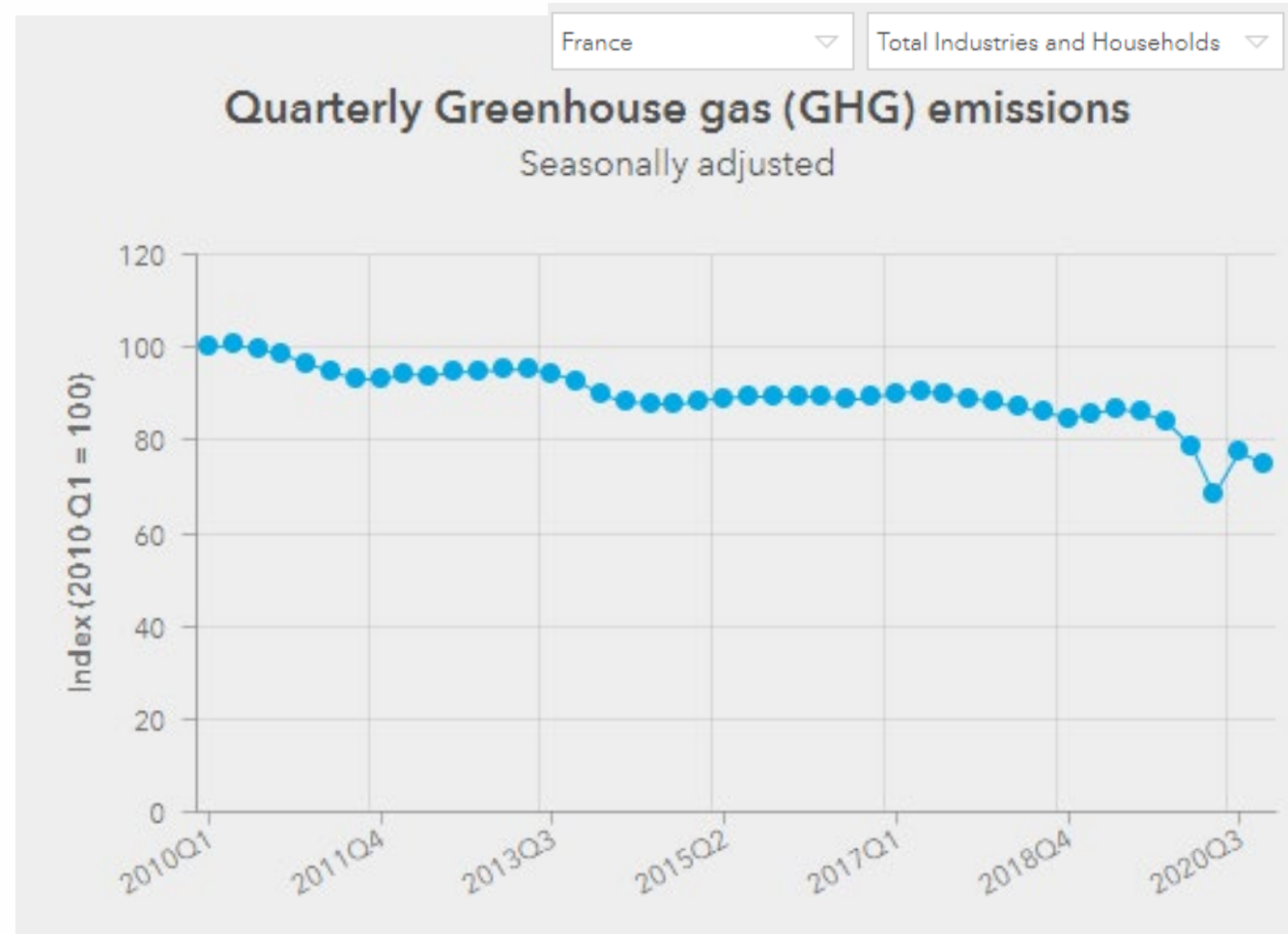
2030 Emission Targets

Worldwide 2030 emissions targets are 10% below 2018 levels…. well above what is needed to limit warming to 2º Celsius by 2050.

Global GHG Emissions - Baseline, Business As Usual Projections and NDC Targets

Baseline GHG emissions excluding land-use, land-use change and forestry

IMF estimated GHG emissions excluding land-use, land-use change and forestry under a Business as Usual assumption
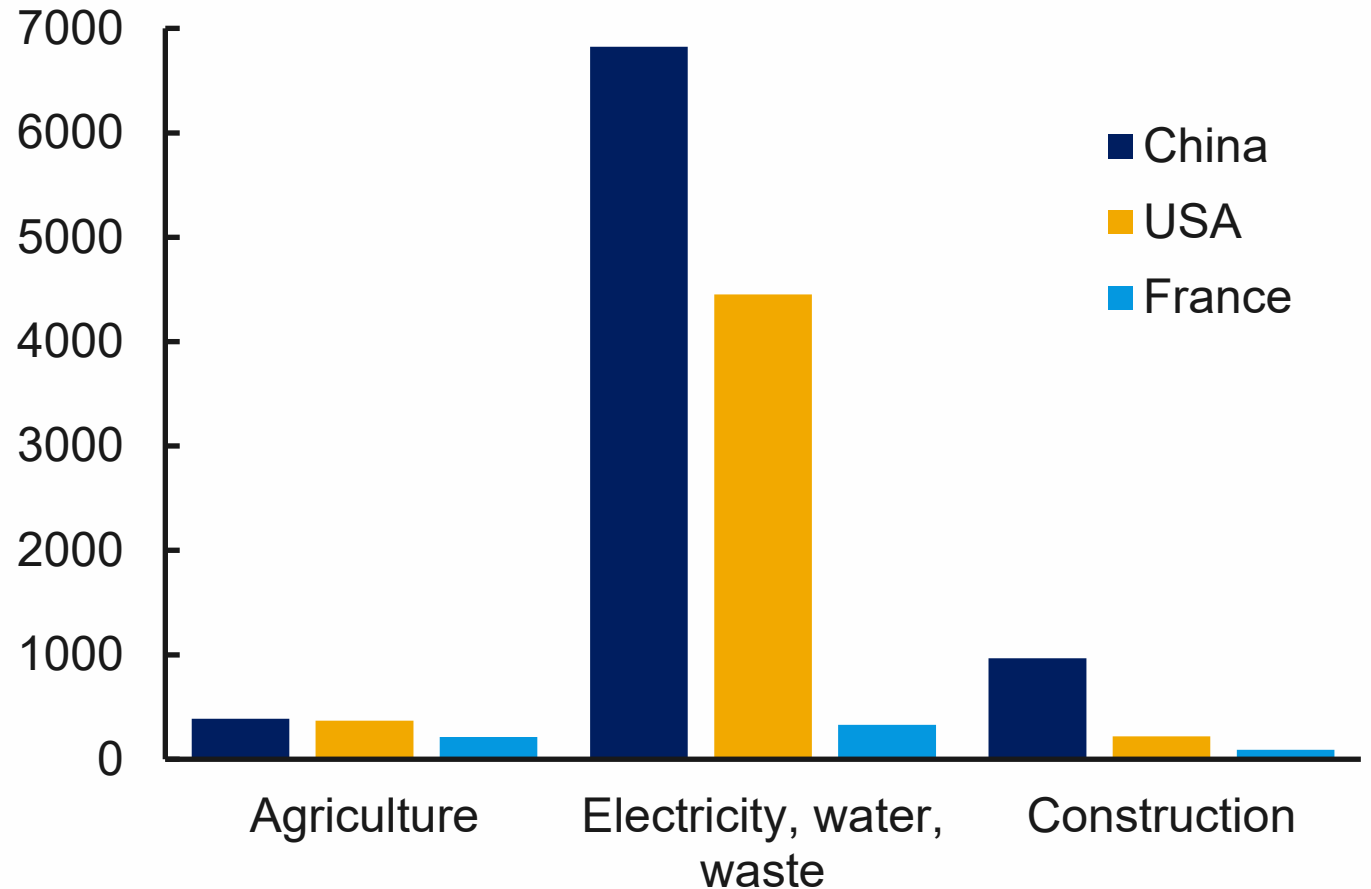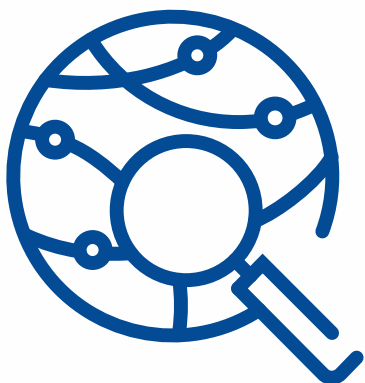
IMF Calculated NDC Emission Targets (2030)

CO2 emissions in tons per million $US of output

CO2 emissions per unit of output from the electricity, water and waste industry in China and the USA far exceed those in France
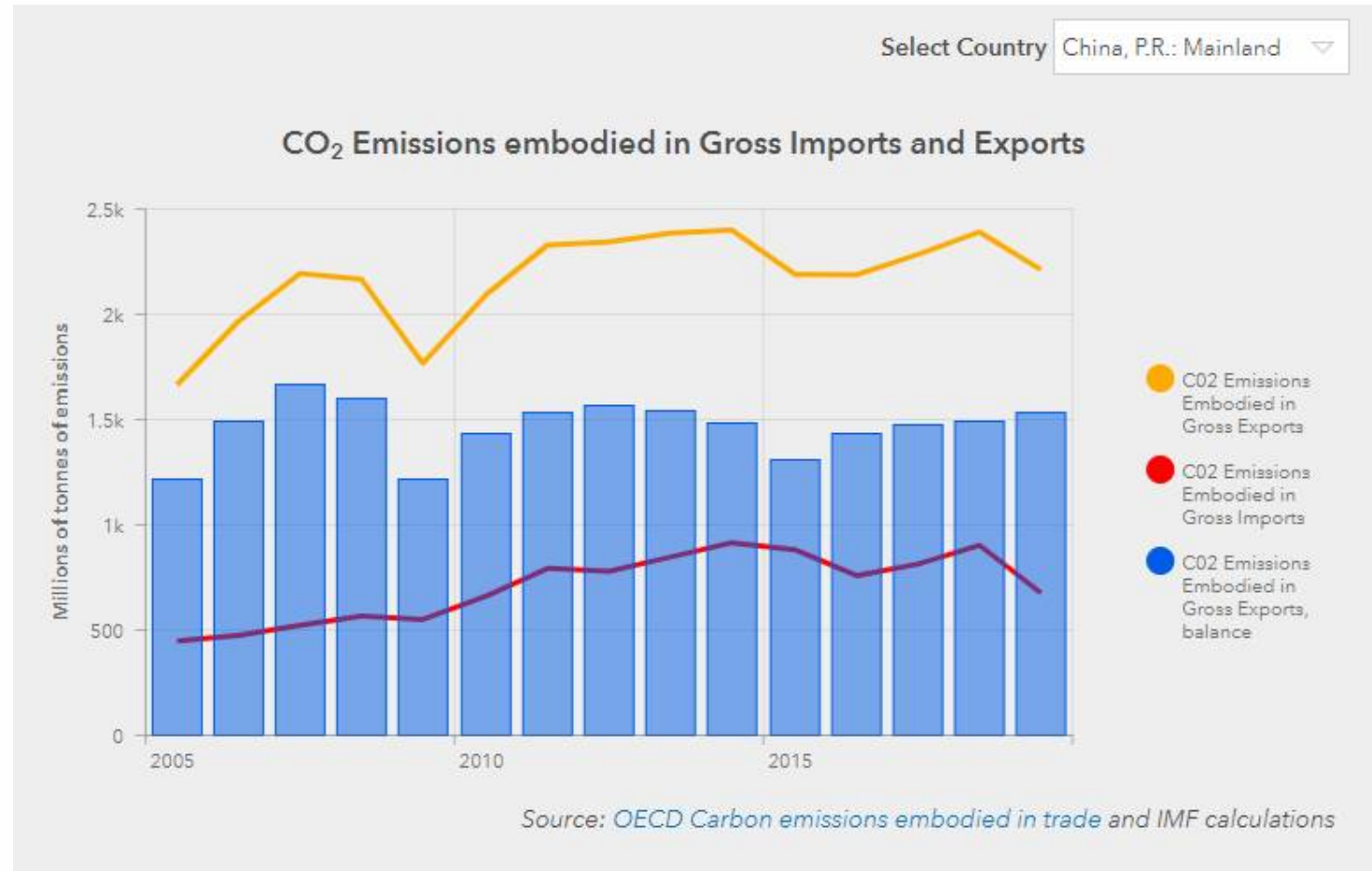

CO2 emissions in tons per million $US of output

Cross-border trade indicators

- **Trade related indicators**
  - CO_2 emissions embodied in trade
  - Trade in environmental goods

- **Direct investment (FDI) related indicators**
  - CO_2 emissions related to new investments financed by FDI
  - CO_2 emissions from the operations of foreign MNEs

CO2 Emissions embodied in trade

- Whether a country is a net exporter or net importer largely reflects the difference between a country's production of CO2 emissions and its demand for them

- Therefore, we need structural changes in both demand and production to reduce global emissions

Select Country | China, P.R.: Mainland

CO₂ Emissions embodied in Gross Imports and Exports

- C02 Emissions Embodied in Gross Exports
- C02 Emissions Embodied in Gross Imports
- C02 Emissions Embodied in Gross Exports, balance

Source: OECD Carbon emissions embodied in trade and IMF calculations

Cross-border indicators: Environmental Goods Imports as Share of Total Imports, in percent

F2018
0.2% ▮▮▮▮▮▮▮▮ 17.6%

© 2021 Mapbox © OpenStreetMap
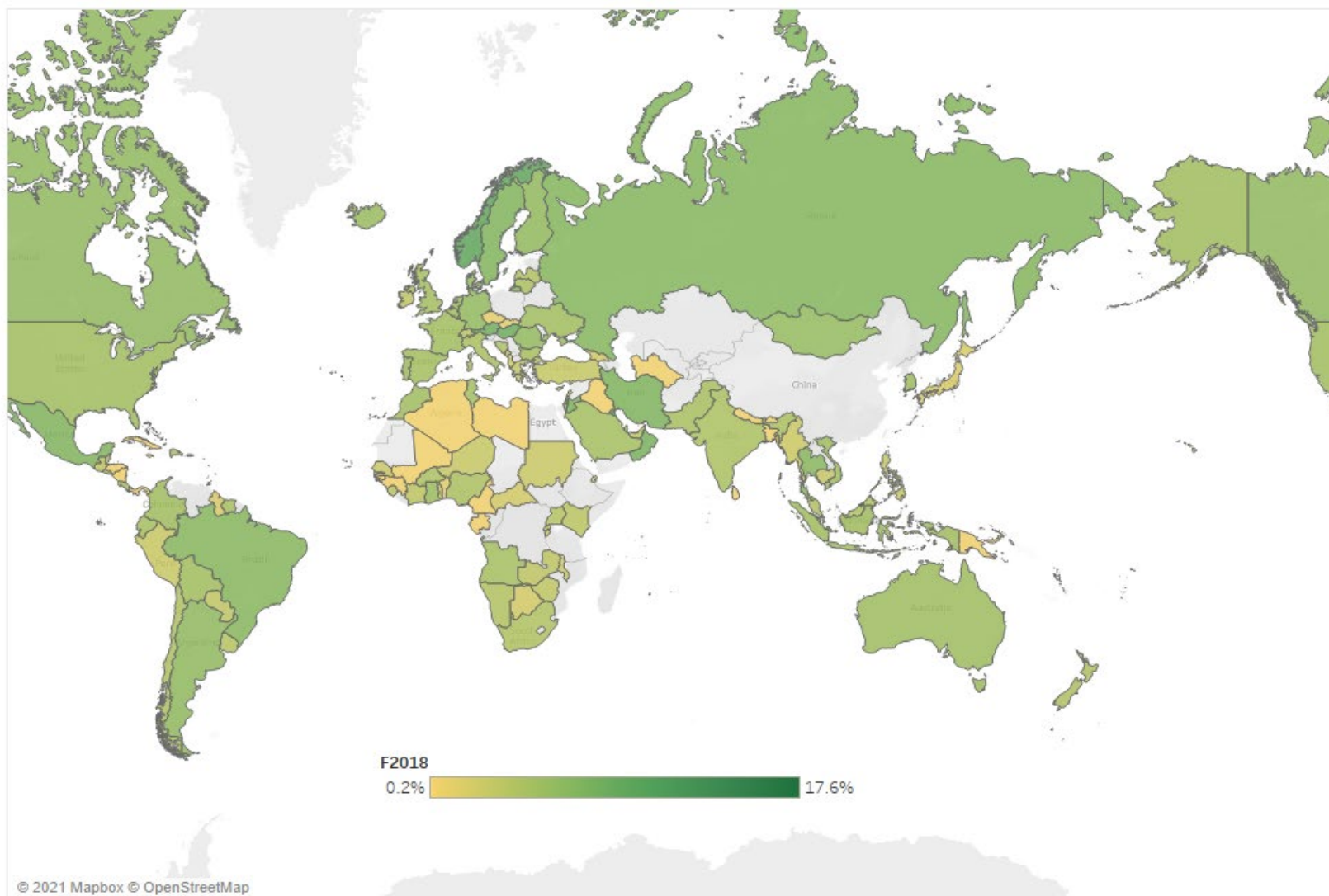
Foreign direct investment related indicators

- Foreign-owned companies that are above the orange line emit more carbon than their share of production would suggest (e.g., United Kingdom). While those below the line emit less (e.g., Estonia)

- Experimental indicators that are only a first step in showing how FDI effects carbon emissions in host economies

Production and emission shares of foreign multi-national enterprises (MNEs) in host economies
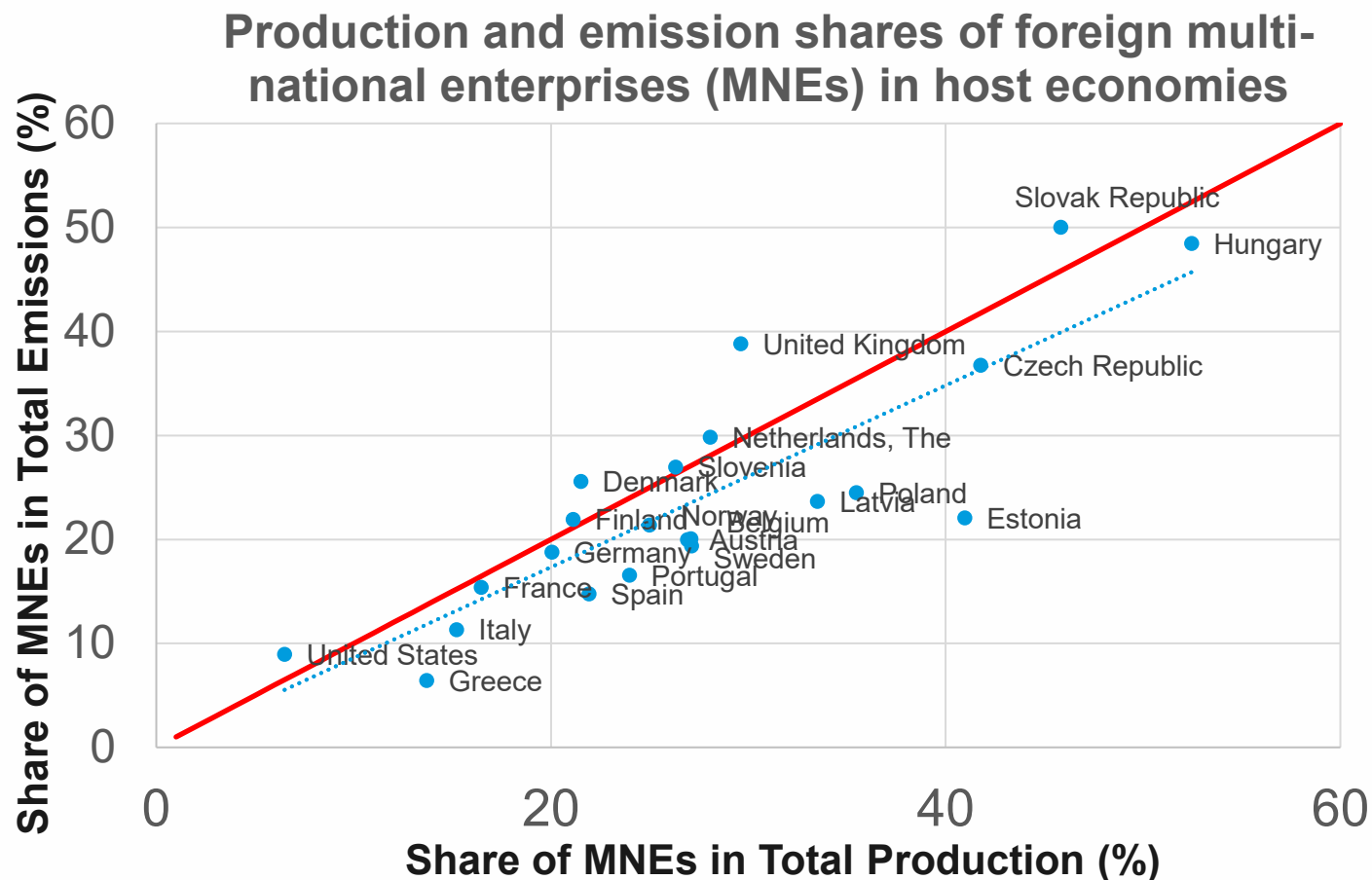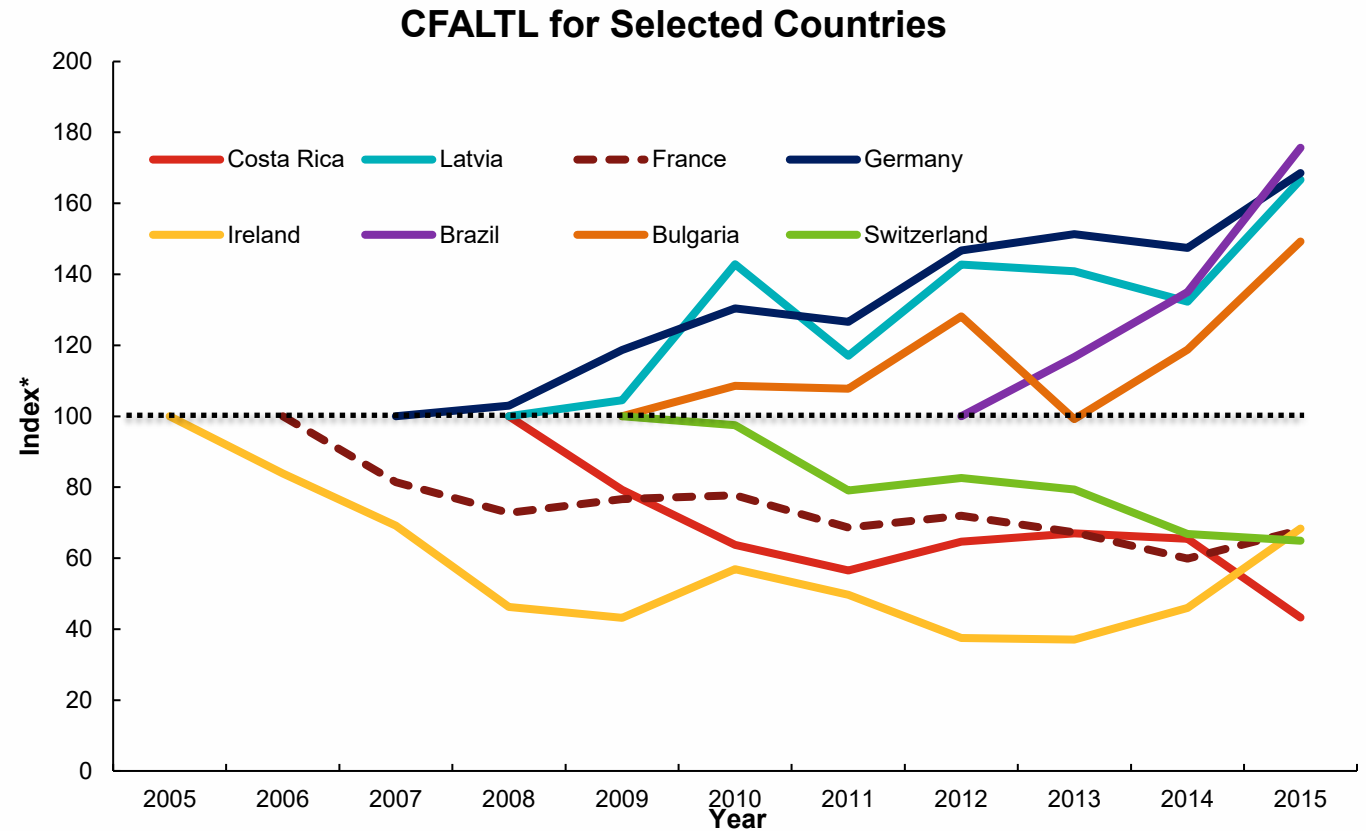
Financial, Physical and Transition Risks Indicators

- **Carbon footprint-adjusted loans to total loans for deposit takers**

- **Green Bonds**

- **Physical Risk**
  - Natural disasters frequency
  - Climate Driven INFORM Risk

- **Transition Risk**
  - Preparedness of countries for a low-carbon transition

Carbon footprint-adjusted loans to total loans (CFALTL)

- CFALTL captures the carbon intensity of domestic loans.

- Calculation based on IMF's loans by industry survey and direct carbon emissions per million $US of output by industry

- CFALTL aims to contribute to the disclosure of the carbon intensity of domestic loans

CFALTL for Selected Countries

Legend: Costa Rica, Latvia, France, Germany, Ireland, Brazil, Bulgaria, Switzerland

Y-axis: Index*

X-axis: Year (2005–2015)

*CFALTL normalized to 100 for the first available data point for each country

Climate-driven INFORM risk indicator

- Composite indicator to assess natural disaster exposure risks.

- Three main components:
  - Climate-driven Hazard & Exposure
  - Vulnerability
  - Lack of coping capacity

- Based on INFORM Risk Index 2021 developed by European Commission with IMF's adjustment.

Climate Driven Inform Risk

Legend:
- > 8 - 10
- > 6 - 8
- > 4 - 6
- > 2 - 4
- 0 - 2
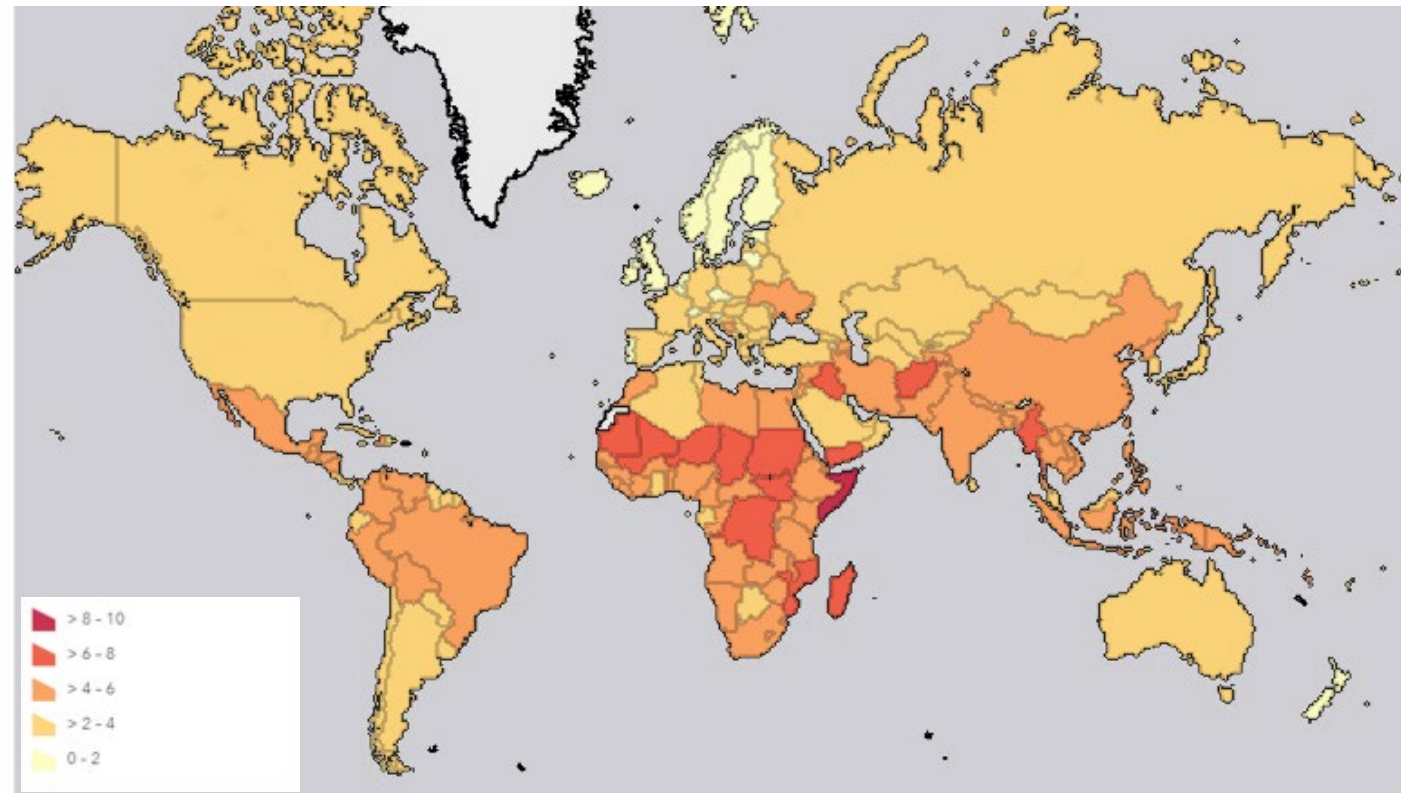
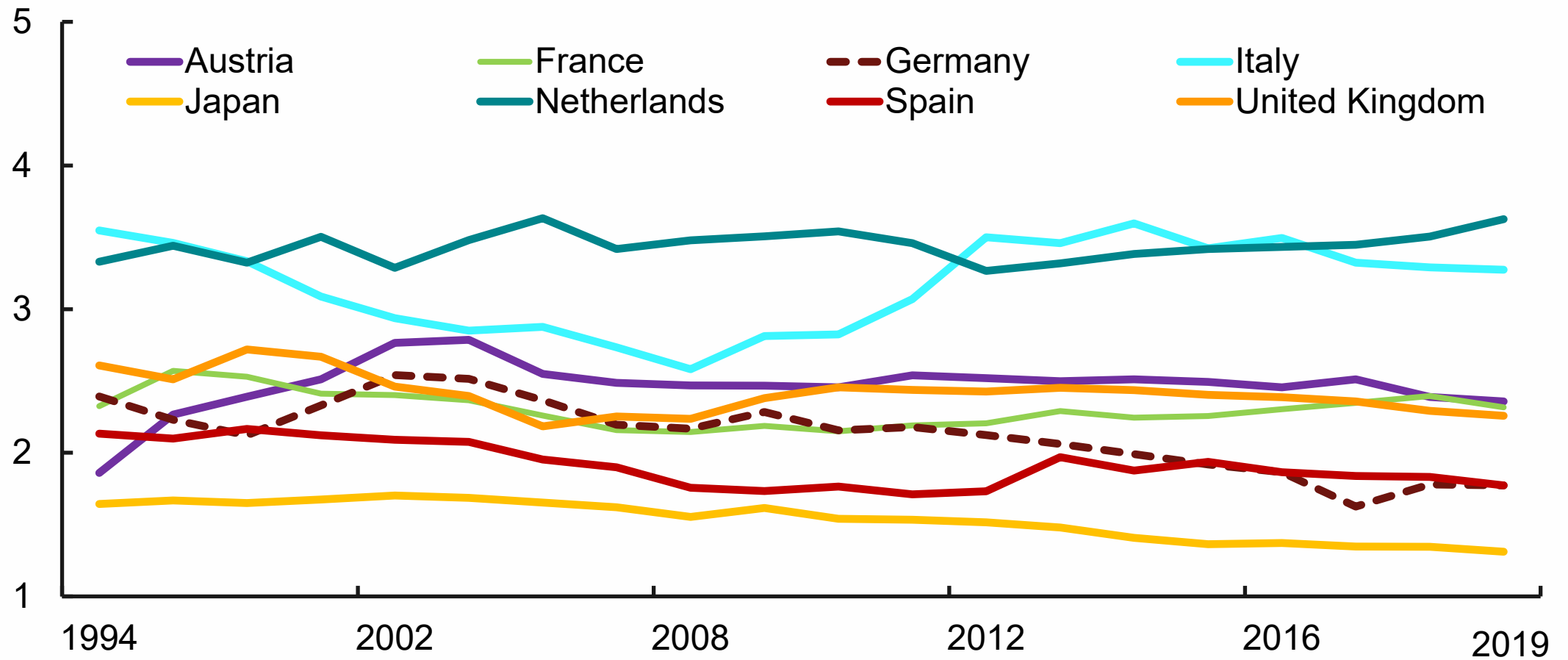*The higher the indicator the higher the risk
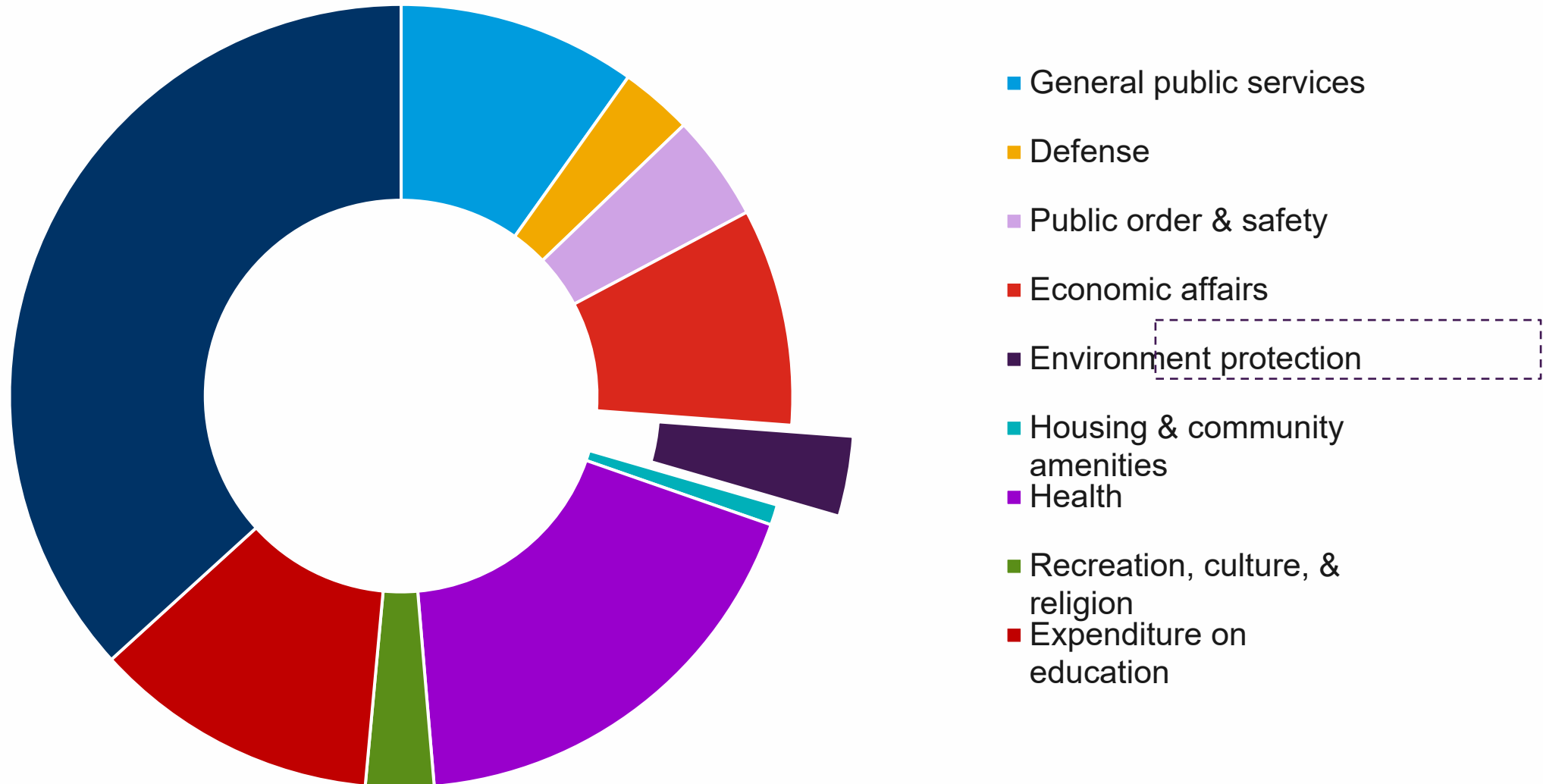
Government policy indicators

- Government policy instruments to tackle climate change include revenue measures (taxes), expenditure measures (subsidies and other spending, tax expenditures), and regulatory measures (licenses, fees, fines, and permits).

- Initial focus of the dashboard is on revenue and expenditure measures – **environmental taxes** and **government expenditures on environmental protection**.

- Data for these two government policy indicators are based on long standing data collections by the IMF and the OECD and supplemented by additional questionnaire to IMF member countries.

Environmental Taxes in Percent of GDP

Netherlands
Share of Government Expenditures, 2019

Legend:
- General public services
- Defense
- Public order & safety
- Economic affairs
- Environment protection
- Housing & community amenities
- Health
- Recreation, culture, & religion
- Expenditure on education

Future work

Future work: a continued effort going forward

Substantial work ahead:

- Enhance the methodology and the economic activity classification and breakdowns.

- Incorporate indicator on fossil fuel subsidies

- Breakdown of environmental goods by type

- Improve identification of climate related expenditures, as well as government actions through the tax system

Climate Change Indicators Dashboard

An international statistical initiative focused on climate-related economic indicators

Economic Activity and Climate Indicators

Greenhouse gas emissions

Carbon Emission per unit of Output

Climate Indicators

Cross Border Indicators

Trade-related Indicators

Direct investment-related Indicators

Financial, Physical and Transition Risk Indicators

Carbon footprint-adjusted loans
to total loans for deposit takers

Green Bonds

Physical Risks | Transition Risks

Government Policy Indicators

Environmental Taxes

Government Expenditure on Environmental Protection