GHG Emission Analysis

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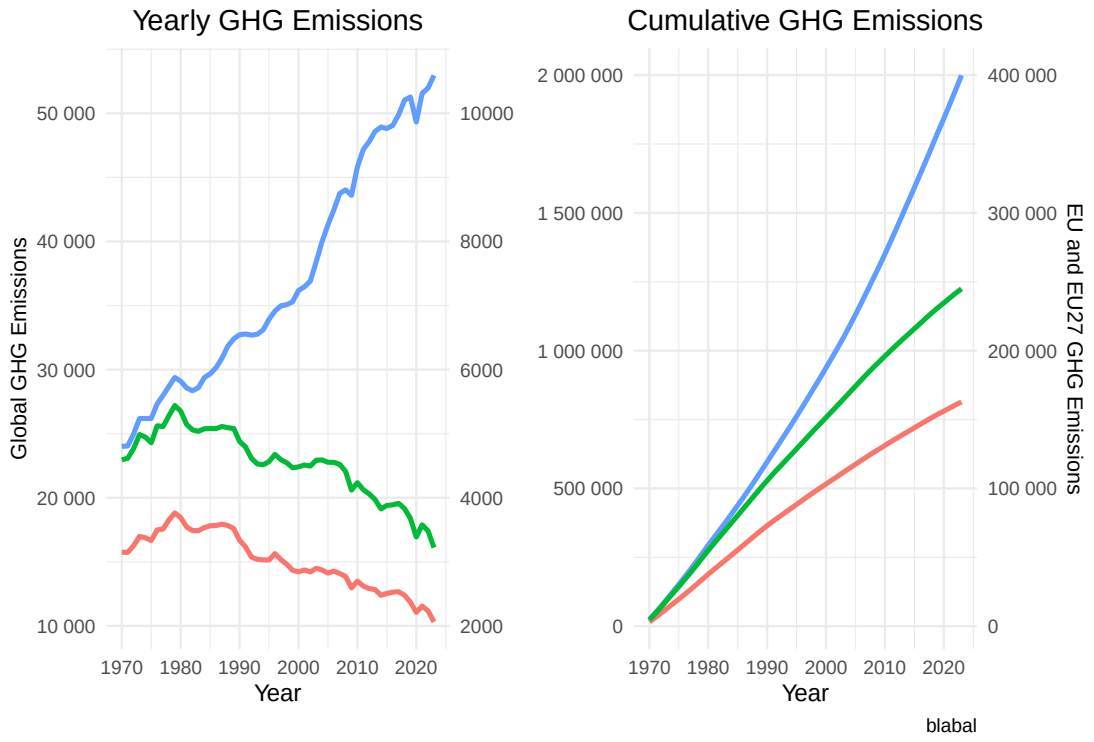
This report is part of the application process to the "Data Science Analyst - Publication and visualisation team" position at the ECB. Using data from the latest EDGAR report on GHG emissions, I visualize and comment different trends of global GHG emissions. Here are the results:

Chart 1: Evolution of GHG Growth

The chart below compares the evolution of GHG emissions in the Euro Area, EU27, and worldwide. Please note that the left axis show emission amounts (in MtCO2eq/yr) globally, while the right axis shows emissions for the Euro Area and EU27.



The following observations can be made from the analysis of GHG emission growth in the Euro Area, EU27 and globally:

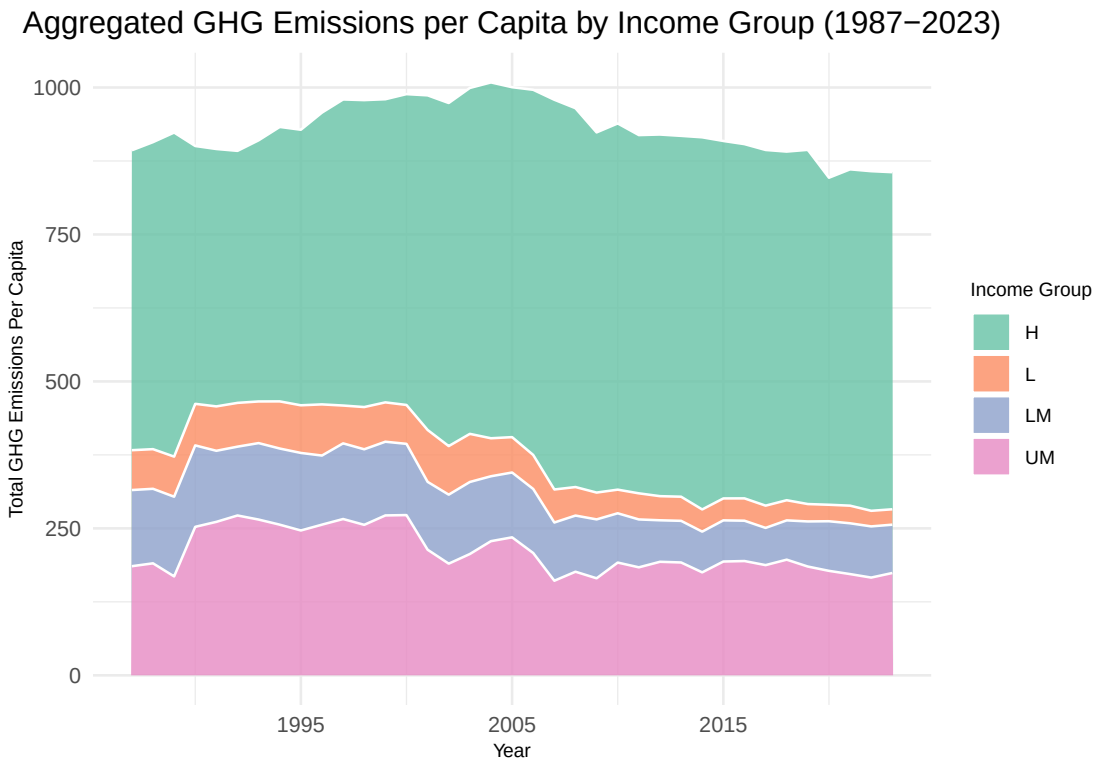
- Emissions in the EU27 have steadily decreased over the past decades.
- The euro area shows a similar trend but with smaller reductions.

- Global emissions show a continued increase over the wole time horizon.

For an interactive version please explore this link.

Chart 2: GHG Emissions Per Capita by Income Groups

The graph shows the evolution of GHG emissions per capita (expressed in tCO2eq/cap/yr) by income group. Income groups are based on World Bank classifications, the data was retrieved here. The earliest data for income groups starts in 1987. Countries with missing observations were discarded. Income Groups: H=High, L=Low, LM=Lower-Middle, UM=Upper-Middle.



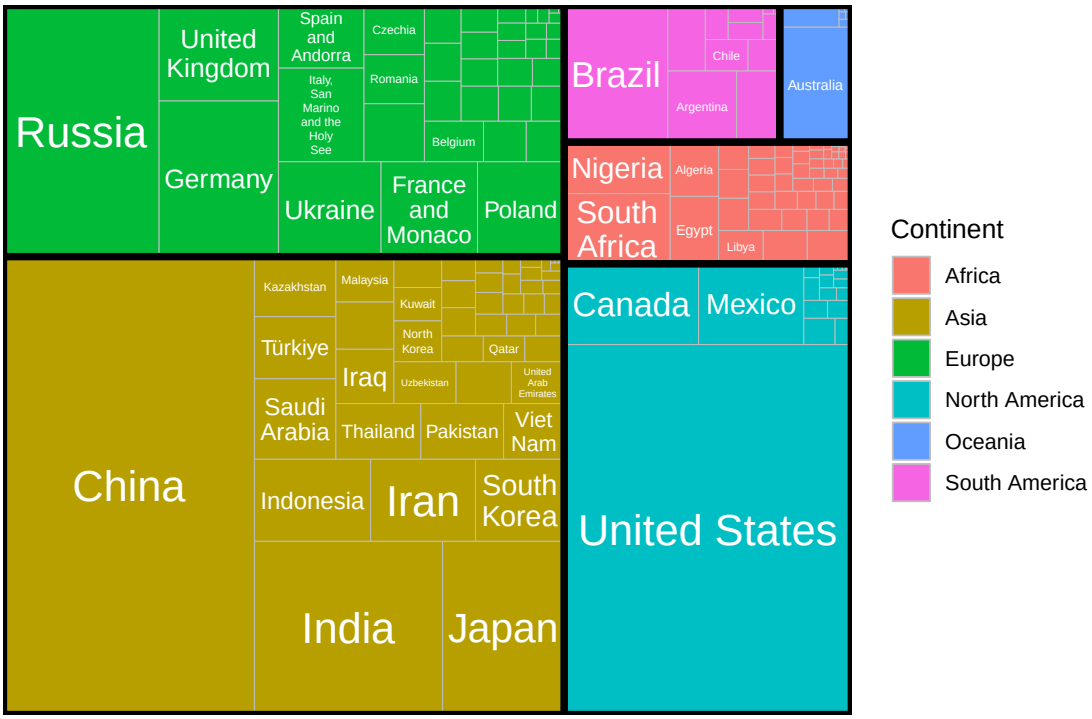
The following observations can be made about the evolution of per capita GHG emissions aggregated by income classes:

- High-income countries have by far the highest per capita emissions.
- The proportion of contributions by income class has remained fairly stable over the time horizon.
- Global emissions have slightly decreased over the last couple of decades.

Chart 3: Contribution to Total World GHG Emissions

In order to visualize the contributions of continents and countries to global GHG emissions, I decided to use a treemap representation. The treemap below shows the contributions for the year 2023. For an interactive version showing the trends over the last decades please explore this link.

GHG Emissions Contribution by Country and Continent



The following observations can be made.

- China and the USA are the largest contributors to global emissions.
- Europe's contribution has been declining (mostly due to green policies).
- Emerging economies in Asia are increasing their share.

Tools and Process

The data analysis underlying this report was performed in R using RStudio. Specifically, I imported the EGARD dataset into an SQLite database for structured querying and manipulation. For data wrangling and analysis I used the tidyverse package (dplyr, ggplot2, ...). Additional interactive viualization were built using the shiny package and hosted on shiny.io. Finally, the results were combined in a pdf file using RMarkdown. The process and code can be seen on my github.