Global CO_2 Emissions Tracker by Sector

Introduction

Carbon dioxide emissions are one of the primary contributors to global warming. Understanding which countries and sectors contribute most to these emissions is crucial in addressing climate change. The 'Global CO_2 Emissions Tracker by Sector' dashboard serves as a transparent tool for tracking and analysing emissions over time, helping drive data-informed policy and environmental responsibility.

Abstract

This project presents a data-driven dashboard that visualizes global carbon dioxide (CO_2) emissions across three major sectors—energy, transport, and industry—on a per-country basis. The purpose is to enable policymakers, researchers, and the public to monitor and compare emission trends globally, and understand the role of each sector and nation in climate change.

Tools Used

- Python (Pandas) – Data cleaning, merging, and computation of per capita and per GDP metrics.
- Power BI – Interactive dashboard with maps, charts, and KPI visuals.
- Excel – Data verification, manual entry, and formatting.

Steps Involved

1. **Data Collection**
   - Imported two datasets.
     - Multi-year emissions dataset by country and sector.
     - World GDP and population data by year and country.

2. **Data Cleaning and Transformation (Python)**
   - Standardized data format to year.
   - Aggregated emissions by sector, year and country.
   - Merged with GDP and population data.
   - Computed emissions data with GDP and population.

- Calculated:
  - **Emissions per capita** = Total emissions / population
  - **Emissions per GDP** = Total emissions / GDP

3. **Data Visualization (Power BI)**
   - Created interactive filters (year, sector).
   - Developed visuals:
     - KPI Cards (Total Emissions, Top Emitting Country, Sectors)
     - Bar chart: Emissions by sector
     - Filled map: Country-wise total emissions
     - Country-wise table with totals and rankings.

4. **Dashboard Design**
   - Applied structured layout: Header, KPIs, Charts, and Map.
   - Ensured readability with consistent units and color schemes.
   - Added labels, tooltips, and a data source citation.

Conclusion

The Global CO_2 Emissions Tracker dashboard offers an interactive way to identify the largest contributors to climate change by sector and region. By comparing emissions data relative to population and GDP, users gain insight into both absolute and contextualized emissions. This tool provides a valuable resource for decision-makers to prioritize action toward emission reduction goals.