Project Report

Global CO2 Emissions Tracker by Sector

Tools Used: Python, Excel, Tableau

Prepared by: [Your Name]

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1. Introduction

The goal of this project was to analyze and visualize global CO2 emissions by sector-specifically energy, transport, and industry-across different countries over multiple years. The project aims to support better understanding of emission patterns and provide data insights for policy recommendations.

2. Objectives

- Build an interactive dashboard to track CO2 emissions by sector.
- Prepare per capita and per GDP metrics to enable fair comparisons between countries.
- Identify top-emitting countries and sector-wise contributions.
- Summarize key findings in a policy brief.

3. Data Sources

- Our World in Data (OWID): Provided detailed CO2 emissions data by country, sector, year, along with population and GDP.
- World Bank: Used for GDP and population data verification.
- The main dataset used was 'owid-co2-data.csv', which was cleaned and processed in Python.

4. Tools and Methodology

4.1 Data Preparation

- The raw dataset was cleaned using Python (Pandas).

- Unnecessary rows (aggregates like 'World' or 'Asia') were removed.
- Only relevant columns were selected.
- Missing values were dropped or handled as needed.
- Final cleaned dataset was saved as 'cleaned_emissions_data.csv'.

4.2 Dashboard Development

- Tableau was used to create interactive visualizations.
- Geographic roles were assigned to countries for map visualizations.
- Sector-wise bar charts, per capita comparisons, and emissions intensity (per GDP) were created.
- Filters and highlights were added for year, country, and sector selection.

5. Key Insights

- China, the United States, and India are the largest total CO2 emitters.
- The energy sector contributes the most to emissions in most countries.
- Developed countries show higher transport emissions per capita.
- Emissions per capita are highest in countries like Qatar, Australia, and the USA.
- Some countries with large populations have low per capita emissions.
- Emissions intensity (CO2 per GDP) varies, indicating differences in energy efficiency.

6. Deliverables

- Interactive Tableau Dashboard: Shows emissions trends, sector comparisons, and geographic distributions.
- Policy Brief (PDF): Summarizes findings and provides actionable recommendations for reducing emissions.

7. Conclusion

This project provided a structured approach to understanding global CO2 emissions by sector. By combining statistical data and interactive visualizations, it helps identify critical areas for climate policy intervention. Future work can involve forecasting emissions trends or integrating renewable energy adoption data.