**Global CO₂ Emissions Tracker by Sector**

**Introduction**

The rise in carbon dioxide (CO₂) emissions is a primary driver of global climate change. Monitoring and analyzing CO₂ emissions by sector enables governments, organizations, and researchers to better understand emission patterns, evaluate the impact of policies, and identify areas for intervention.  
This project aims to create an interactive dashboard that tracks global CO₂ emissions by sector over time, providing valuable insights through data visualizations built using Tableau.

**Abstract**

This project leverages historical CO₂ emissions data to develop an interactive tracker that displays emissions trends across various economic sectors such as **electric power**, **transportation**, **industry**, **residential**, and **commercial**. The tracker supports data exploration by year, region (if applicable), and sector, enabling users to make informed decisions and raise awareness about emissions distribution.  
The ultimate goal is to facilitate **transparent climate monitoring** and promote **data-driven policy development** through visual storytelling.

**Tools Used**

* **Python (Pandas)**: For data cleaning, preprocessing, and formatting.
* **Tableau**: For creating interactive dashboards and data visualizations.
* **Excel/Google Sheets** *(optional)*: For quick pivoting and manual data inspection.
* **CSV Dataset**: Emissions data sourced from U.S. EIA or international energy agencies.

**Steps Involved in Building the Project**

1. **Data Collection**
   * Collected emissions data from public databases (e.g., EIA, IEA, Our World in Data).
   * Downloaded as CSV for easy handling.
2. **Data Cleaning (Python)**
   * Removed malformed rows and non-numeric values.
   * Converted year-month (YYYYMM) format to proper datetime.
   * Handled missing values and ensured consistent units (Million Metric Tons).
3. **Data Preparation**
   * Grouped emissions by sector and year.
   * Calculated yearly totals and sector-wise contributions.
   * Generated derived metrics like % change year-over-year.
4. **Data Visualization (Tableau)**
   * Created line graphs to show trends over time.
   * Designed bar charts to compare sectoral contributions annually.
   * Developed heatmaps to highlight peak emission periods.
   * Used filters for Year and Sector to enable interactivity.
5. **Dashboard Development**
   * Combined charts into a cohesive dashboard.
   * Added dropdowns and date sliders.
   * Ensured responsiveness and visual clarity.

**Conclusion**

This project successfully demonstrates how **data visualization can make complex environmental data accessible and actionable**. The Global CO₂ Emissions Tracker offers insights into emission trends by sector and time, helping users identify which areas need more attention or policy reform.  
The project supports environmental awareness and empowers stakeholders to make informed decisions through **interactive, data-driven storytelling**.