🗺️EcoMap

Executive Summary

EcoMap is an interactive web application designed to visualize CO_2 🏢emissions data across countries and continents. It offers an intuitive and insightful interface for understanding global and regional emission trends, empowering decision-makers and researchers with actionable data insights.

Problem Statement

Despite growing awareness about climate change, accessing and interpreting global CO_2 emissions data remains challenging for researchers, policymakers, and the general public. Existing tools are often static or lack interactivity, making it difficult to analyze data at different levels of granularity (e.g., country, region, or per capita).

User Stories

1. **Researcher** 👩‍🔬: I want to view trends in emissions data over time for specific countries to support my academic studies.
2. **Citizen**🙍 : I want an easy-to-understand visualization of CO_2 emissions to better understand the impact of human activity on climate change.

Goals

- Provide an interactive and visually appealing platform to analyze CO_2 emissions data.
- Enable year-based filtering of emissions data.
- Allow users to toggle between total emissions and emissions per capita.
- Offer multiple visualization formats: world map, pie chart, and bar chart.
- Ensure accessibility and responsiveness across devices.

Non-Goals

- Predict future CO_2 emissions.
- Provide in-depth policy recommendations or analysis.
- Include data visualization for greenhouse gases other than CO_2.

Key Metrics

- **User Engagement**: Measure the average time spent on the platform and the number of interactions with visualization elements.
- **Usage Frequency**: Track the number of unique users and session counts.
- **Data Accuracy**: Ensure data consistency and correctness across visualizations.
- **Responsiveness**: Maintain a loading time of under 2 seconds for visualizations on desktop and mobile devices.

Rollback Criteria

- Major inconsistencies in displayed CO_2 data across visualizations.
- System crashes or slow loading times exceeding acceptable thresholds.
- Significant usability issues reported by users during testing.
- High error rates in rendering dynamic visualizations.

Technical Concerns

- **Scalability**: How well does D3.js handle large datasets for high-resolution global emissions data?
- **Browser Compatibility**: Are there any known issues with rendering D3.js visualizations on older browsers?
- **Data Updates**: What is the best approach to periodically update emissions data to maintain relevance?
- **Performance**: Strategies to ensure smooth rendering of visualizations on low-end devices.

Appendix

Tools and Technologies

- **Frontend**: HTML5, CSS3, JavaScript, D3.js

Additional References

- D3.js Documentation: https://d3js.org
- Visualization Design Best Practices