CAPSTONE

Climate Change Crisis

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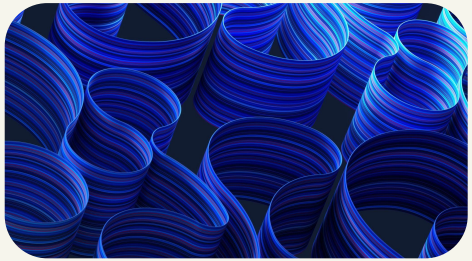
Dataset Overview



Year

Includes data about the other 4 factors as the years pass by.

CO2 Emissions

How much carbon dioxide is emitted as a cause of human industry.

Temperature Anomalies

How our temperature is recording anomaly numbers as climate change gets worse.

Population

How our population plays a factor as the years pass by.

Renewable Energy

How much we as a population are investing and using renewable energy to help reduce wasteful consumption.

[Link to Github w/ code and dataset.]

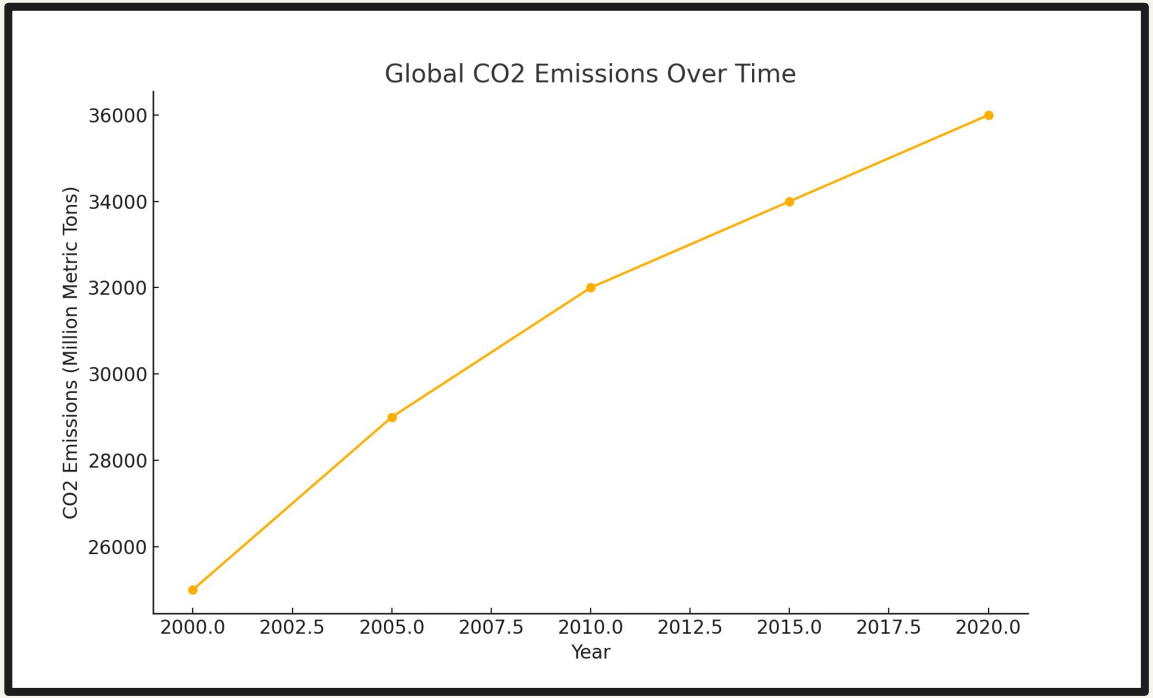
Goals & Motivation

Motivation: I wanted to explore trends in global CO2 emissions, temperature anomalies, population growth, and renewable energy adoption to understand the effects of climate change on our planet.

Goal: Use the dataset I found to to find insights and provide good info to address climate change.

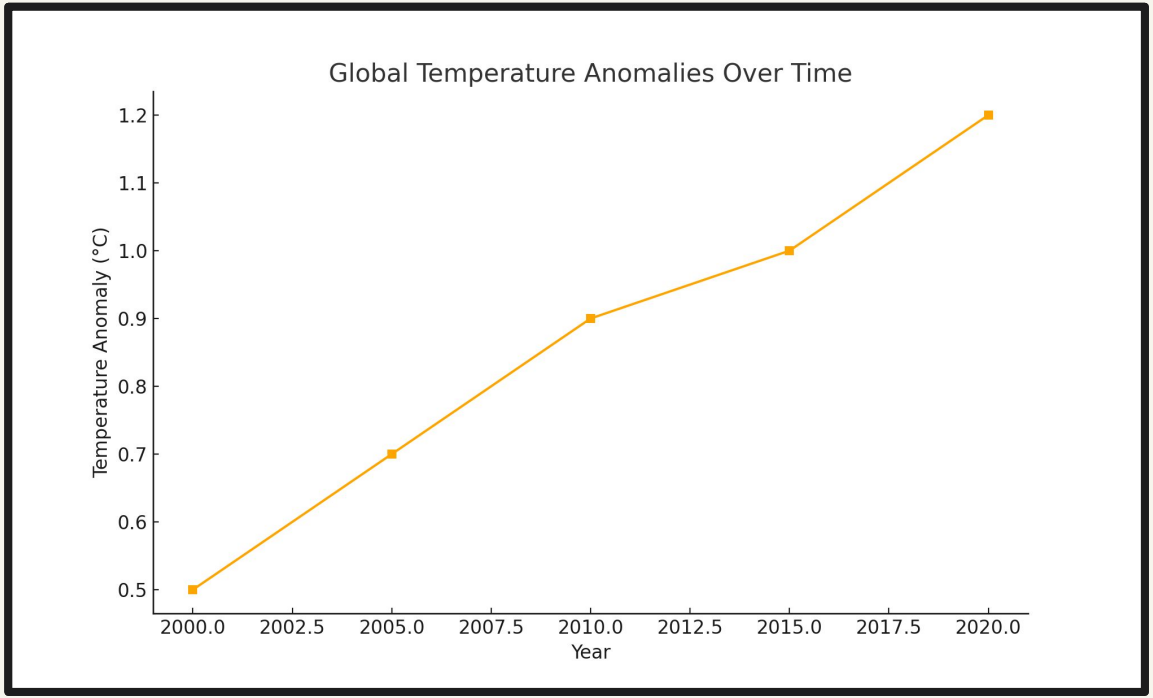
CO2 Emissions Over Time

The graph demonstrates a steady increase in global CO2 emissions from 2000 to 2020. This trend highlights the persistent reliance on fossil fuels despite global awareness of climate change. The sharp increase between 2000 and 2010 aligns with industrial expansion in developing countries. This trend emphasizes the urgency of transitioning to renewable energy sources to curb emissions.



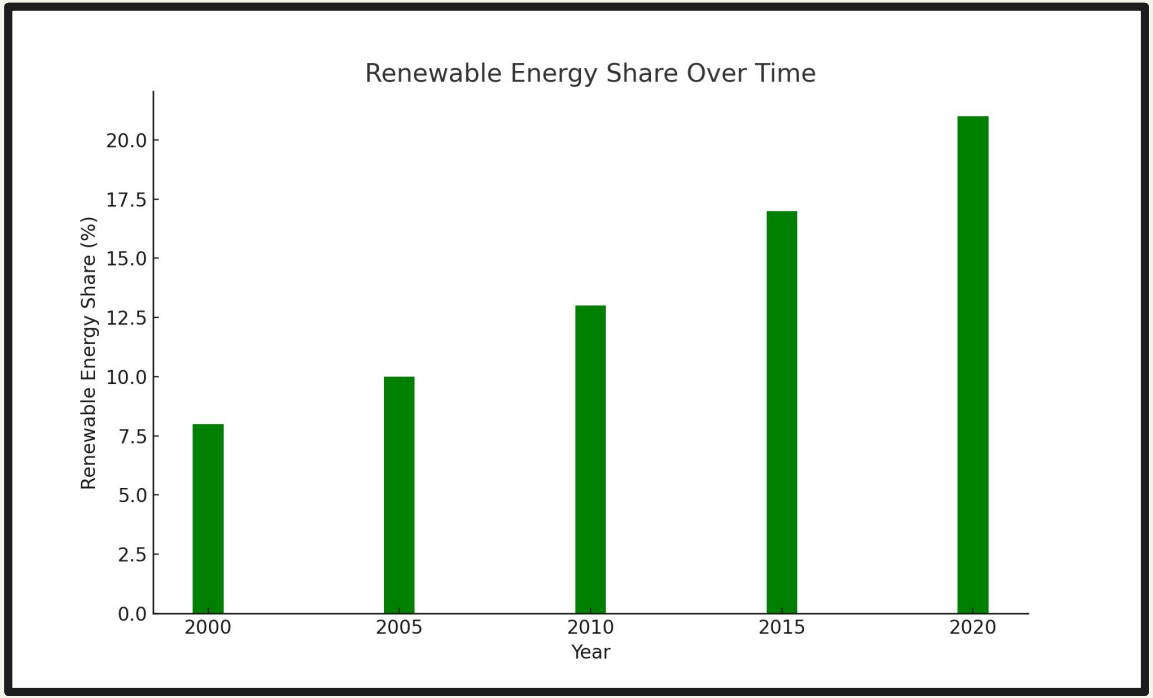
Temperature Anomalies

The plot of temperature anomalies over time shows a clear upward trajectory, with anomalies increasing from 0.5°C in 2000 to 1.2°C in 2020. This increase correlates with rising CO2 levels, reinforcing the relationship between greenhouse gas emissions and global warming. The data underscores the critical need for global efforts to mitigate climate change through emission reductions and adaptation strategies.



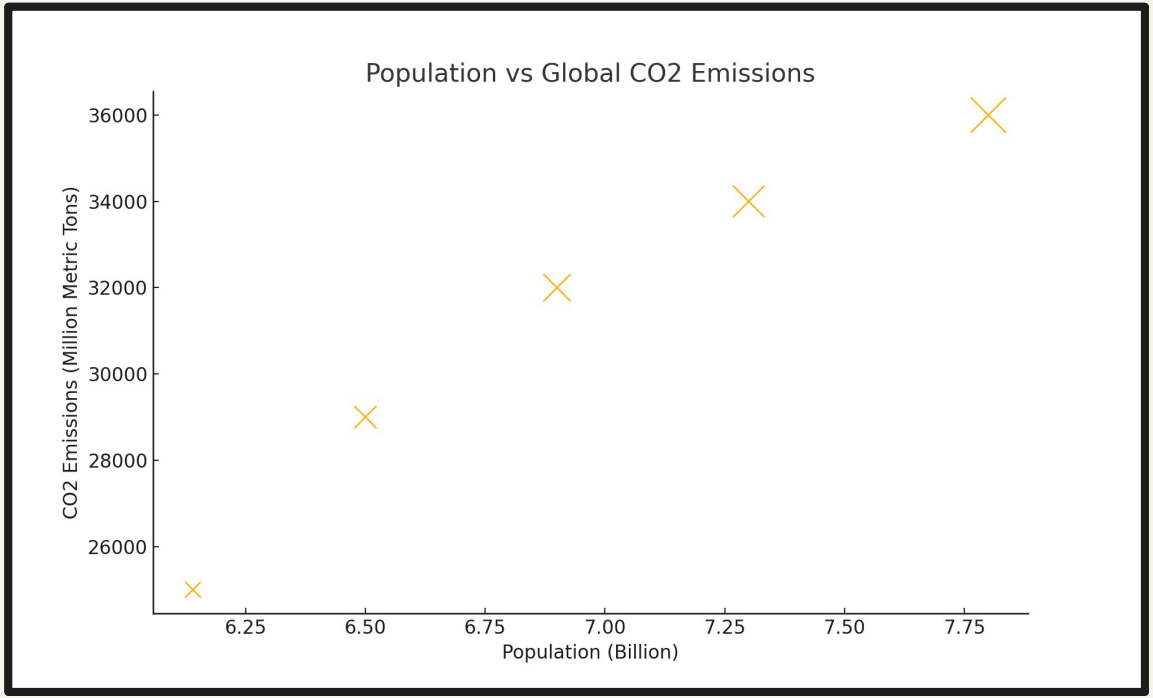
Renewable Energy

Renewable energy share has grown steadily from 8% in 2000 to 21% in 2020. While this indicates progress in adopting sustainable energy, the growth rate needs to accelerate to meet global climate goals. Increasing investments in renewable energy technologies is essential to reduce CO2 emissions and achieve a sustainable energy mix.



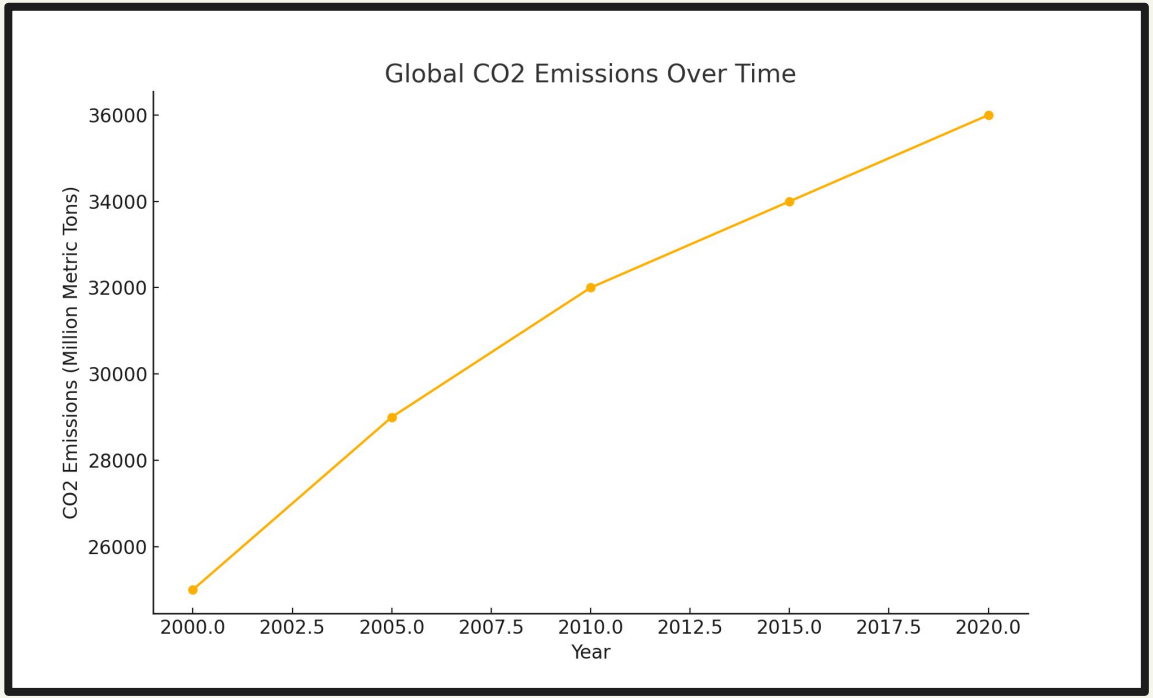
Population vs. CO2

The scatter plot reveals a positive correlation between population growth and CO2 emissions. As the global population increased from 6.14 billion in 2000 to 7.8 billion in 2020, CO2 emissions also rose significantly. This relationship suggests that managing population growth and improving energy efficiency are critical in addressing climate change.



Correlation Analysis

The heatmap of correlations between key metrics provides a comprehensive view of their interrelationships. Strong positive correlations are observed between population and CO2 emissions, and between CO2 emissions and temperature anomalies. Interestingly, renewable energy share shows a weaker, inverse correlation with CO2 emissions, emphasizing its potential role in reducing emissions.



Model Design & Implementation

Purpose: Predict CO2 emissions based on population growth and renewable energy adoption.

Regression Model

This would trained on different key insights found from the graphs and analysis.

Analysis of R^2

This would be used to evaluate just how accurate our model is.

Insights

These would reveal the significant impact of population and energy usage on emissions.

Societal Impact

We can highlight the urgency of addressing climate change with some of these solutions.

1

Demonstrating the rise in CO2 emissions and global temperatures.

2

Advocating for renewable energy adoption.

3

Providing actionable data to policymakers and researchers.

Overall

Our impact is that we are informing strategies to mitigate climate change effects and transition to sustainable energy solutions.

THANK YOU