Linking National Emissions to Global Temperature Trends: An Analytical Exploration

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1 Introduction

The purpose of this analysis report is to establish and analyze the link between diverse national emissions to global temperature change over the course of 30 years.

This analysis tried to resolve the following questions:

1. Out of the all the emissions produced, which emission had the greatest impact?
2. Which country/countries contribute to major temperature change?
3. Is there a direct co-dependency of temperature with emissions?

2 Used Data

- **Dataset 1: Emissions by Country Dataset.** [1]

  This dataset provides an in-depth look into the global CO_2 emissions at the country-level, allowing for a better understanding of how much each country contributes to the global cumulative human impact on climate.

- **Dataset 2: All Countries Temperature Statistics 1970-2021.** [2]

  This dataset provides information on changes in global surface temperature across all countries from 1970 to 2021. It includes data on temperature variations over a 51-year period and is based on information from various sources, including weather stations, satellites, and ocean buoys.

3 Analysis

3.1 Data Visualization

Figure 1 indicates the temperature change increasing and decreasing over the years but overall average from 1990 to 2020 increased constantly.

Figure 2 indicates the emissions from coal, gas and total over the years. The trend indicates constant increase in emissions from 1990 to 2020.

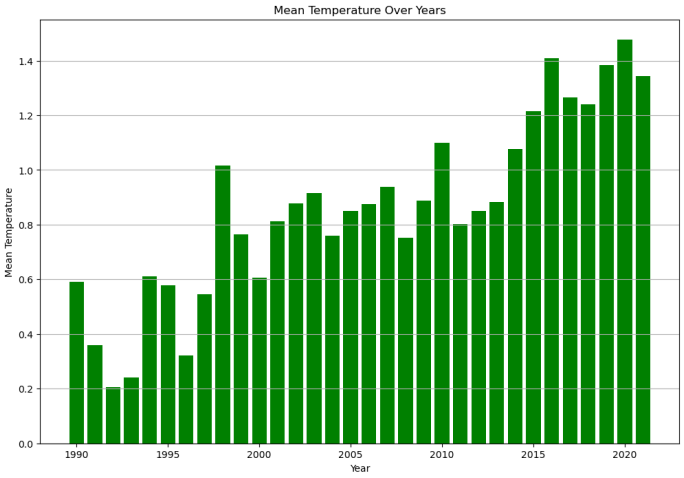


Figure 1: Mean Temperature change from 1990-2020

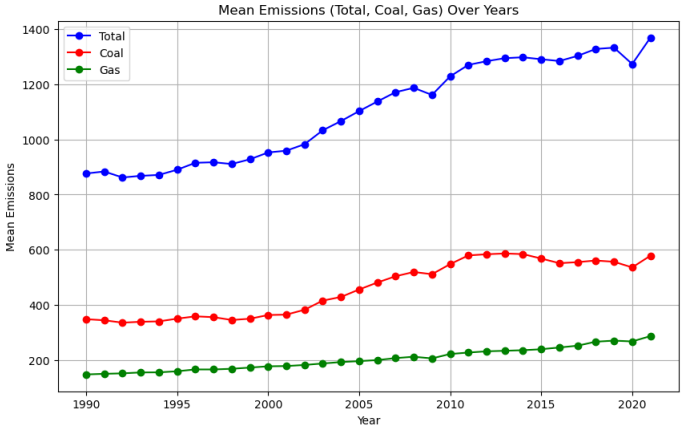


Figure 2: Emissions during the years 1990-2020

3.2 Co-relation

From 1990 to 2020, data indicates a general trend where increasing emissions correlate with rising temperatures (indicated in Figure 3) . However, there are occasional anomalies where lower emissions coincide with a decrease in temperature change. These outliers may be influenced by regional climate variability or other environmental factors.

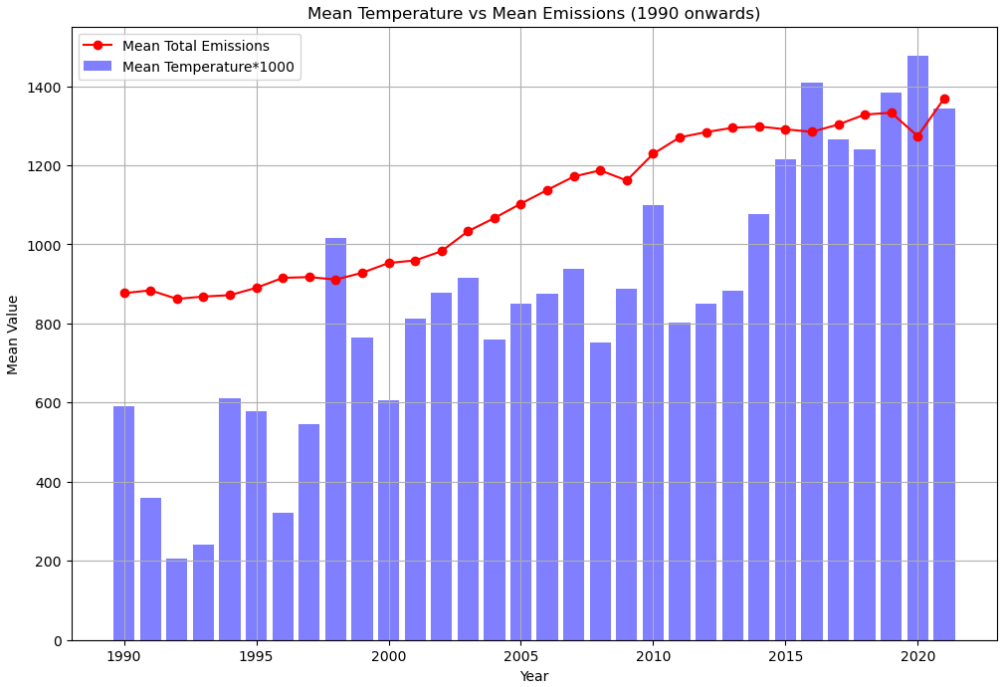
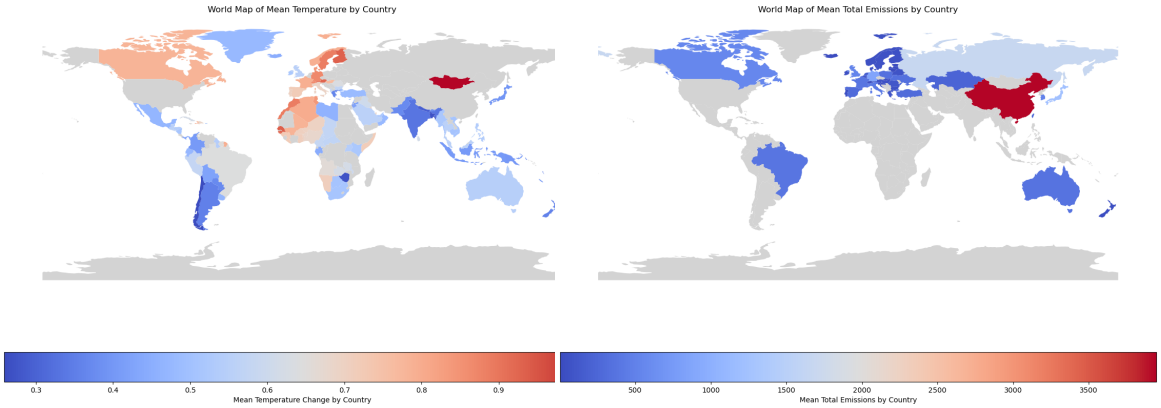


Figure 3: Analytic Exploration between emissions and temperature change

3.3 Country based analysis



(a) Temperature Change (b) Emissions

Figure 4: World-map of Temperature change and Emissions

Nations that display the most noteworthy emissions, such as the United States and China, moreover tend to encounter the foremost critical temperature changes over time. For occurrence, these countries have reliably contributed significant sums of greenhouse gasses to the environment, relating with observable increments in average temperatures. On the other hand, nations with comparatively lower emissions, such as many European countries with strict natural approaches, frequently appear more direct temperature changes. This relationship underscores the basic connect between emissions levels and subsequent climate impacts, highlighting the worldwide suggestions of outflow lessening endeavors.

4 Conclusion

To conclude the project's analysis and answer the questions addressed:

1. Out of all the emanations created, carbon dioxide (CO2) by and large has the most noteworthy affect due to its critical commitment to the greenhouse impact and long climatic lifetime.

2. Nations with the most elevated emissions, such as the United States, China, and the European Union, contribute essentially to major temperature changes universally.

3. There's a direct co-dependency between temperature and emissions, where higher emissions, particularly of greenhouse gasses like CO2, lead to increased worldwide temperatures over time.

References

[1] Quantifying Sources and Emission Levels: `https://www.kaggle.com/datasets/thedevastator/global-fossil-co2-emissions-by-country-2002-2022`

[2] Analyzing changes in global surface temperature across all countries of 50 years: `https://www.kaggle.com/datasets/mdazizulkabirlovlu/all-countries-temperature-statistics-1970-2021`