Final Project

Comparing CO2 emissions between China and OECD countries

Filippo Lisanti (fl2680), Justus Scharfstaedt (jws2214) and Greta Ernst (gme2124)

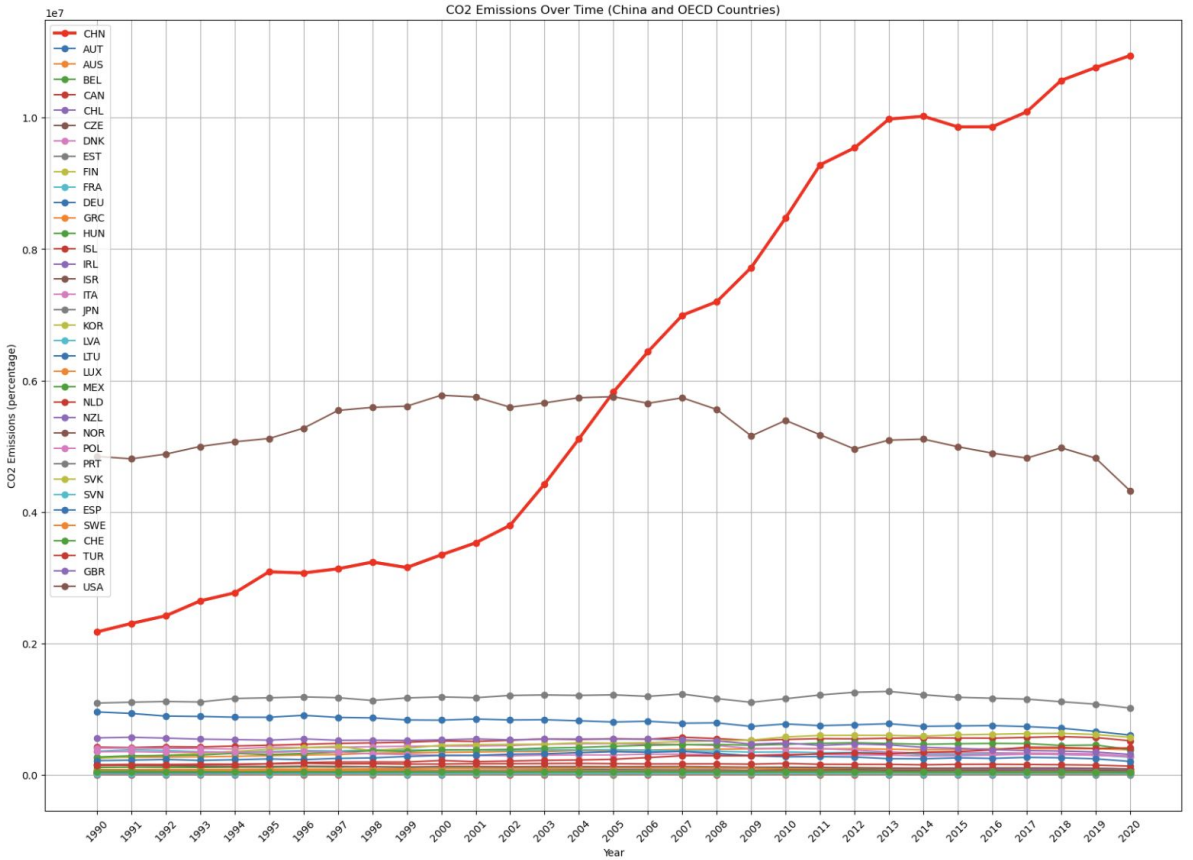
Part 1. Visualization

1.1 Comparing CO2 Emissions

Data Presentation

Collection of Data for each Country:

- X-Axis: Year between 1990 - 2020
- Y-Axis: CO2 Emissions
- Country codes legend is presented on the left.



All Countries

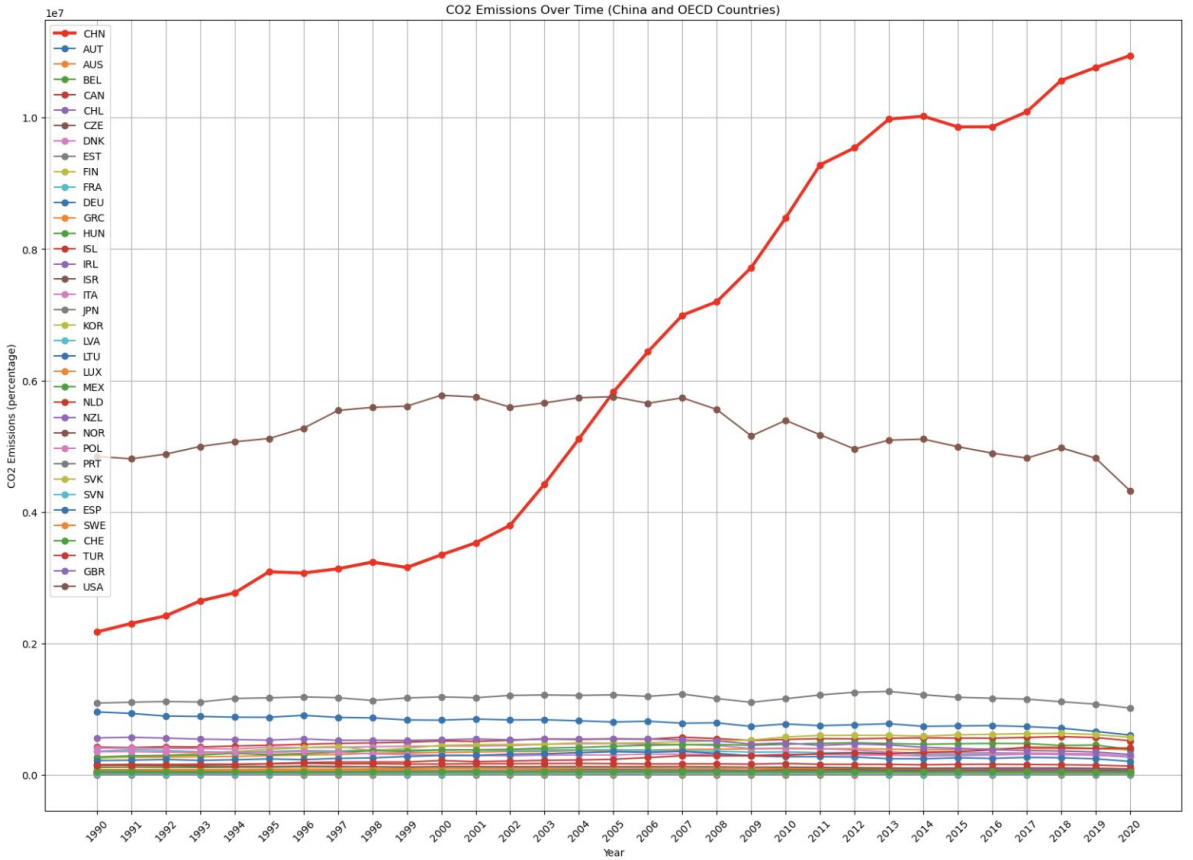
Analysis

OECD countries had stable or slightly increased annual CO2 emissions.

The USA consistently had higher emissions than other OECD countries.

China's CO2 emissions increased rapidly.

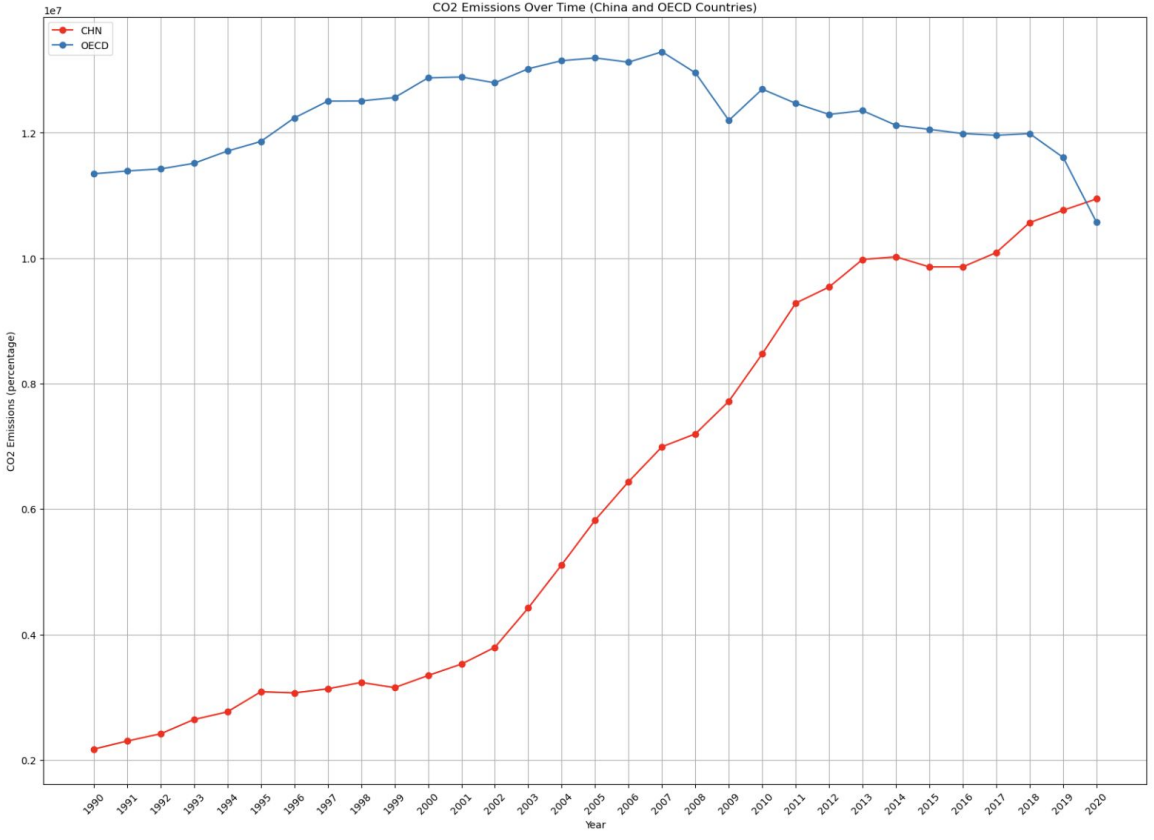
Since 2005, China has been the largest emitter, surpassing USA the greatest emitter to that point in time.



China & OECD countries

Analysis

In 2019, China's emissions exceeded the combined emissions of all 37 OECD countries by 2019.



China & OECD countries

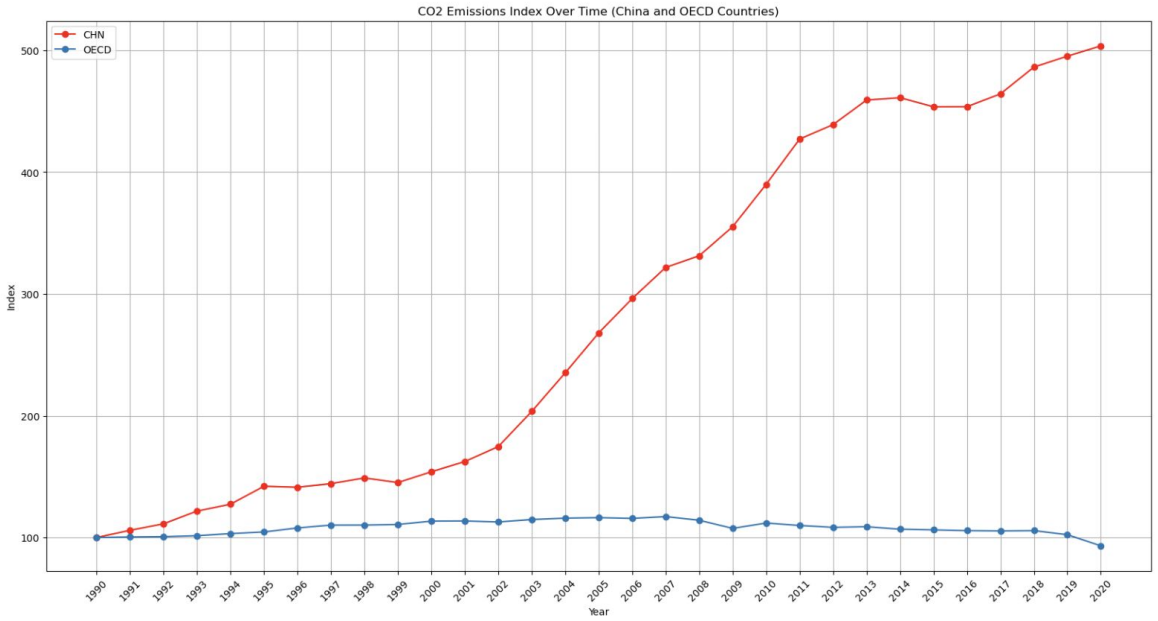
Index Graph Analysis

The indexed graph contrasts China's CO2 emissions with OECD countries from 1990-2020.

China is identified as the highest global CO2 emitter.

The surge in China's emissions is mainly due to coal-related activities.

These activities include coal-fired power stations, coal mining, and blast furnaces for iron and steel production.



Part 1. Visualization

1.2 Comparing CO_2 emissions and GDP (USD) of China and OECD countries

Part 2. Statistical Analysis (Linear Regression)

Statistical Analysis

Null hypothesis: The slopes of the Linear regression lines for CO2 emissions trends (1990-2020) in China and the OECD countries are equal.

Alternative hypothesis: The slope of the Linear regression line for CO2 emissions trend (1990-2020) in China is greater than the slope for the OECD countries.

Test statistic: The difference in slopes between the Linear regression lines for CO2 emissions trends (1990-2020) in China and the OECD countries.

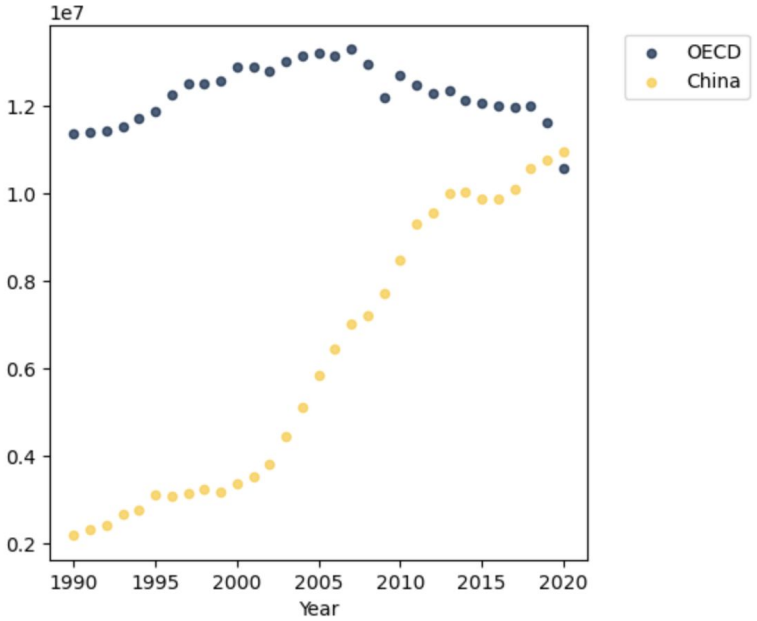
Annual Emissions for China and OECD from 1990 - 2020

Visual Representation

Table: china_oecd_data

China starts of way lower at 1990 but is higher in 2020.

Development clearly seen in scatter plot



Year	China	OECD
1990	2.17336e+06	1.13441e+07
1991	2.30219e+06	1.13891e+07
1992	2.41818e+06	1.14227e+07
1993	2.64541e+06	1.15119e+07
1994	2.76767e+06	1.1707e+07
1995	3.08862e+06	1.186e+07
1996	3.07051e+06	1.22349e+07
1997	3.13411e+06	1.25025e+07
1998	3.23628e+06	1.25052e+07
1999	3.15366e+06	1.25597e+07

... (21 rows omitted)

Annual Emissions for China dn OECD from 1990 - 2020

Linear Regression Analysis

Standardized Regression Slope Calculation

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China slope: 0.974398169661
OECD slope: 0.0115944672875
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Analysis: The difference in slopes is very low.

Project Overview

This project aimed to analyze and visualize the trends in CO2 emissions for China and OECD countries from 1990 to 2020. The data was obtained from the World Bank API, and the analysis involved data processing, visualization, and statistical testing.

Key Findings: China's CO2 emissions outpaced OECD countries, exceeding their combined emissions by 2019, China, with the highest emissions globally, is an outlier, having lower GDP than the U.S. but higher emissions and a 2020 comparison shows a general trend of higher GDP correlating with higher emissions, with China as an exception.

Key Challenges: Inserting the correct version of the csv file into the Jupyter Notebook from World Bank (solved by using web crawling through the website with country codes) and adjusting the axis of the graphs (especially the y axis) due to huge differences in for example co2 emissions