

CO2 Emissions over the years



Author: Josai Kinzunga

Source:

<https://www.kaggle.com/code/abhishekinnvonix/co2-emission-countrywise-visualisation>

Introduction

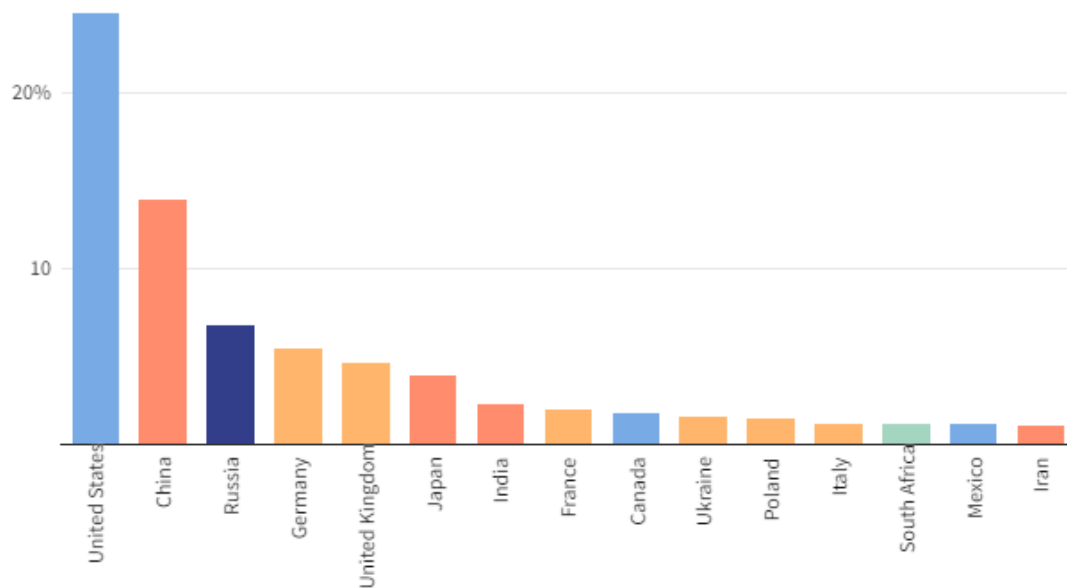
This research will look into CO₂ Emissions on a global scale. Carbon dioxide is a “colorless, odorless and non-poisonous gas formed by the combustion of carbon and respiration for living organisms. In addition, Carbon dioxide emissions are emissions “stemming from the burning of fossil fuels and also the manufacture of cement.” These emissions also include the carbon made from the consumption of solid, liquids, and gas fuels and flaring. Some main examples of CO₂ emissions worldwide include transportation, electricity, and industrial processes. These are the main contributors to CO₂ emissions today

This research will allow readers to gain an understanding of the current emissions and how countries are implementing changes to reduce these emissions. We will also look at many different countries while focusing on huge contributors across the world. Looking into this data to help answer the question of how countries are regulating emissions and if so, can the changes be seen? I believe that researching CO₂ will help widen my understanding of not only CO₂ emissions but also how different countries take steps toward regulation. I also agree that this research will go into the topic of qualifying the types of regulations made and how effective they are.

The graph below shows the total amount of emissions by country from the 1750s to 2020.

Top CO2 Emitting Countries, 1750–2020

Percentage of total (1.7 trillion tons).



Countries color coded by continent. Data as of 2021.

Source: [Union of Concerned Scientists](#)

Data

The current data source being utilized right now is Kaggle datasets. This webpage allows researchers to post and search for datasets for any subject or topic. Not only does Kaggle offer users data but also Code is useful for arranging and structuring the data. These capabilities will allow me to arrange my data in a manner that helps me view the overall flow of CO2 over time. Linked below and on the first page is the link to our main dataset.

[CO2 Emissions Country-wide Visualization](#)

This data contains a wide range of CO2 emissions per country and per year. The emissions are measured in 'metric tons per capita' which means the total amount of emissions divided by the population of the country. This dataset also includes various visualizations which make it very easy and simple to understand the data. One most useful charts from the dataset are the 'Plotly Colorpleth' map. This map visualizes all the data collected in this dataset. Which covers the years 1990 to 2019.

Pre-processing this dataset requires me to specify the important data. Given the fact that this was a large dataset, pre-processing the set took a generous amount of time. Specifically, while pre-processing I marked missing

values and gaps in the dataset. There were some countries with no data at all or with missing values for certain years. After doing such, I mapped the total metrics per capital by each region. East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia, and Sub-Saharan Africa. After doing so, I measured the median emission of the totals by year.

1							
2							
3	Row Labels	Sum of 1998	Sum of 1999	Sum of 2000	Sum of 2017	Sum of 2018	Sum of 2019
4	East Asia & Pacific	113.9143673	114.5110094	118.6881731	141.7721476	140.8370403	140.142667
5	Europe & Central Asia	335.4227921	327.488471	328.7692055	299.6016001	297.0512156	286.2443825
6	Latin America & Caribbean	87.63906163	86.55461929	84.30804816	97.55505004	99.37746331	100.1487301
7	Middle East & North Africa	196.7379451	199.2920297	197.4705573	178.8655393	172.6277682	175.1045497
8	North America	36.34281227	36.3596552	37.22743309	30.36783191	30.87312669	30.10402344
9	South Asia	3.772311946	4.341482449	4.503186509	9.90726371	10.38121205	10.304685
10	Sub-Saharan Africa	35.6215826	37.66088596	35.46317366	44.09269667	44.36144185	43.94235987
11	Grand Total	809.4508729	806.2081531	806.4297773	802.1621293	795.509268	785.9913977
12	Median:	87.63906163	86.55461929	84.30804816	97.55505004	99.37746331	100.1487301
13							
14							

By doing this calculation, I'm able to view a quick shot of the increase in CO2 Emissions. After coming to this realization, I think about the many factors that lead to an increase in CO2 Emissions. I learned that generally, CO2 Emissions are rising globally by year. Looking back to the questions asked at the start of this research, we can prove with this data that CO2 Emissions are rising. Several factors that came to mind in correlation to recent past events are the Covid 19 epidemic. This epidemic caused a huge increase in CO2 Emissions.

Press release article “IEA” stated that the “increased use of coal was the main factor driving up global energy-related CO2 emissions”.

Critiquing the efforts in this work shows both the positive and negative sides of data mining and data manipulation. Data mining allows researchers to cater their data to their desires. The impact of this research is very minimal, but it can be utilized for awareness and a Snapshot of CO2 emissions over the past 20 years. Considering the fact that I only captured data of certain years, it limits the amount of actual data being selected for the showcase.

Citations:

“Glossary: Carbon Dioxide Emissions.” ***Glossary:Carbon Dioxide Emissions - Statistics Explained***, ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary%3ACarbon_dioxide_emissions

Blokhin, Andriy. “**The 5 Countries That Produce the Most Carbon Dioxide** (CO2).” Investopedia, Investopedia, 21 July 2022, www.investopedia.com/articles/investing/092915/5-countries-produce-most-carbon-dioxide-co2.asp.

iea. “**Global CO2 Emissions Rebounded to Their Highest Level in History in 2021** - News.” IEA, 1 Mar. 2022, www.iea.org/news/global-co2-emissions-rebounded-to-their-highest-level-in-history-in-2021.