

Global Energy Consumption Report

23rd August, 2022

Title of project: Global Energy Consumption project – How prepared are we to welcome green energy

Source of data: <https://www.kaggle.com/datasets/jamesvandenbergh/renewable-power-generation?select=top20CountriesPowerGeneration.csv>

Tools used

1. Google Sheets
2. Tableau (Visualization tool)

Problem statement

An energy company is looking to solve the electric power problem and would want to know the power demand and possible ways to approach the problem. The following research questions will aid in finding insight that might lead to answering the problem statement

1. What is the power consumption globally over time?
2. What country consumes the most energy?
3. Does the power consumption equate the power production?
4. What source of power project yields the most energy?

Data Wrangling process

- I. Inline with best practices I had to review the data I got from Kaggle.com. I checked for null values with the filter function on Google sheets.
- II. I proceeded to checking for duplicates in the dataset using the year as point of reference. I ensured that the years were unique across the rows.
- III. Also, I checked for consistency of the data and ensured that numerical data were formatted to number with two decimal points (.0000). This was to accommodate for records with four (4) decimal points.
- IV. I did not use the 'renewablesTotalPowerGeneration' sheet from the dataset as it is the same as 'non-renewablesTotalPowerGeneration' sheet. Instead, I calculated the sum of the renewable power generation.

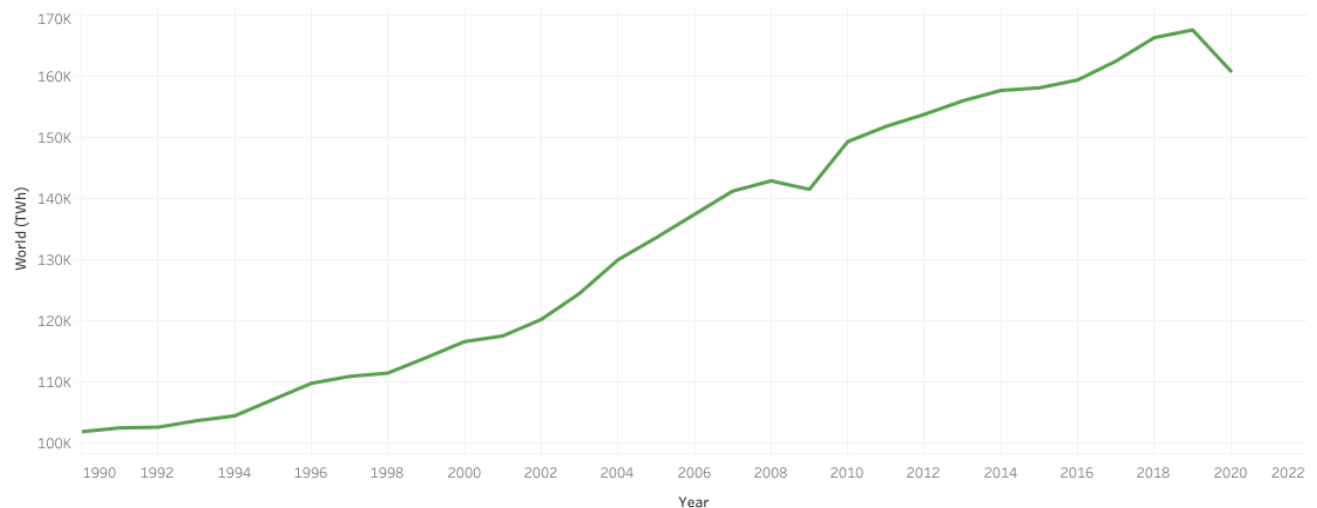
Approach

The approach to this project will first be understanding the performance of power consumption over time, the various mode of production and the capacity of power they produce. This thought will be represented in a visualized diagram. Next, this report will show a comparison between the supply and demand of energy on an aggregated level. Lastly, it will see if there are rooms for improvement and where to improve.

Analysis and Visualization

- The diagram below shows the progression of the world energy consumption over the last 30 years. It is interesting to know that our energy consumption has constantly been increasing. This need for energy could be attributed to technological advancement, blooming economy and amongst others. Although we notice a sharp decline in power consumption between 2008 and 2009 and between 2019 and 2020. These declines were largely due to the global economic crisis and COVID pandemic respectively.

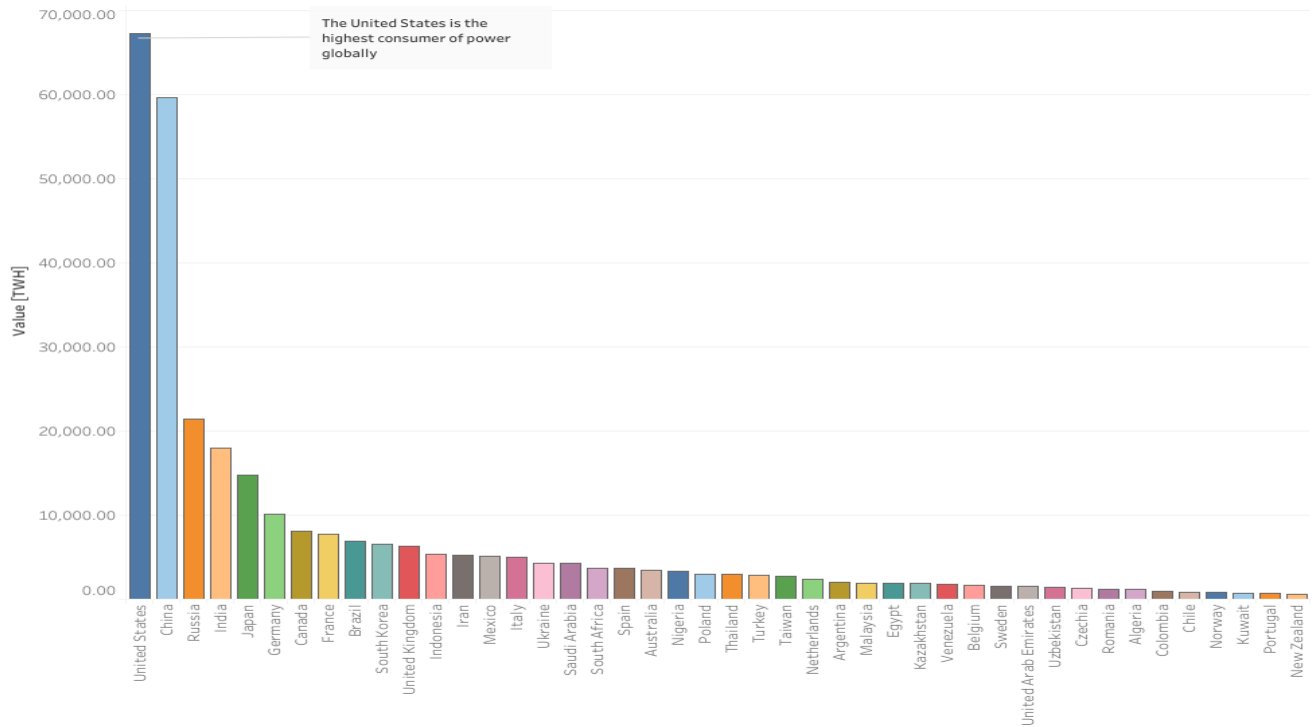
Global Energy Consumption over 30 years



- In response to my second research objective, what country consumes the most energy?

Between 1990 and 2020, The United States, China and Russia are the 3 topmost consumers of electric power respectively.

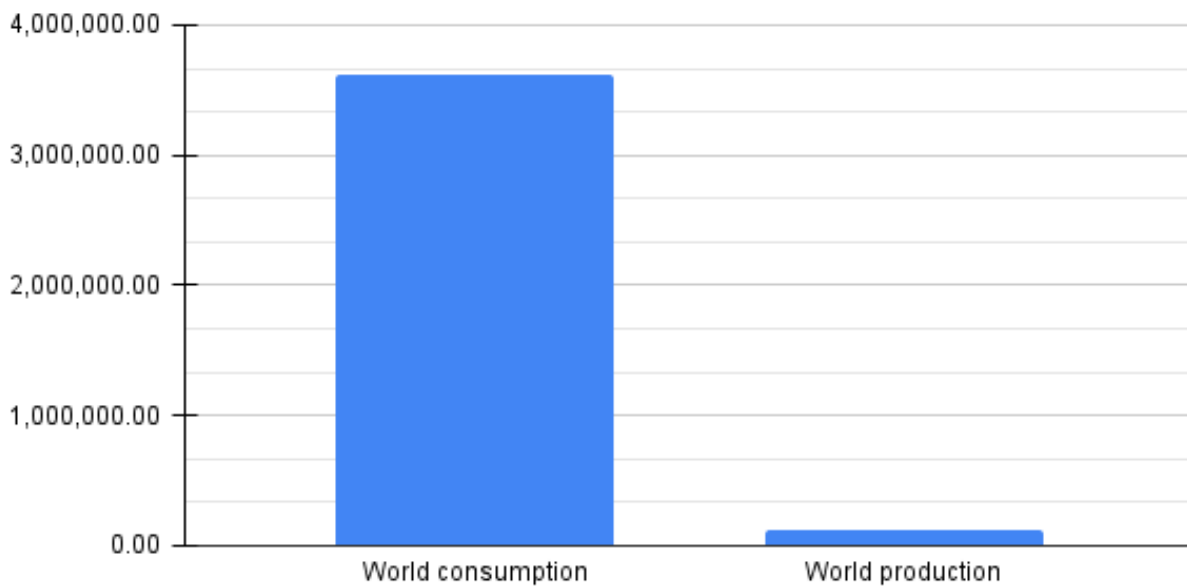
Power Consumption by Country between 1990 and 2020



- The visualization below shows the magnitude of power consumption to power production between 1990 and 2017 globally. I had to use up to 2017 as the dataset for power production dates up to 2017. Hence, I did not include power consumption between 2018 and 2020. As clearly shown, power consumption is far more than the power produced. This tells us more about the demand for power.

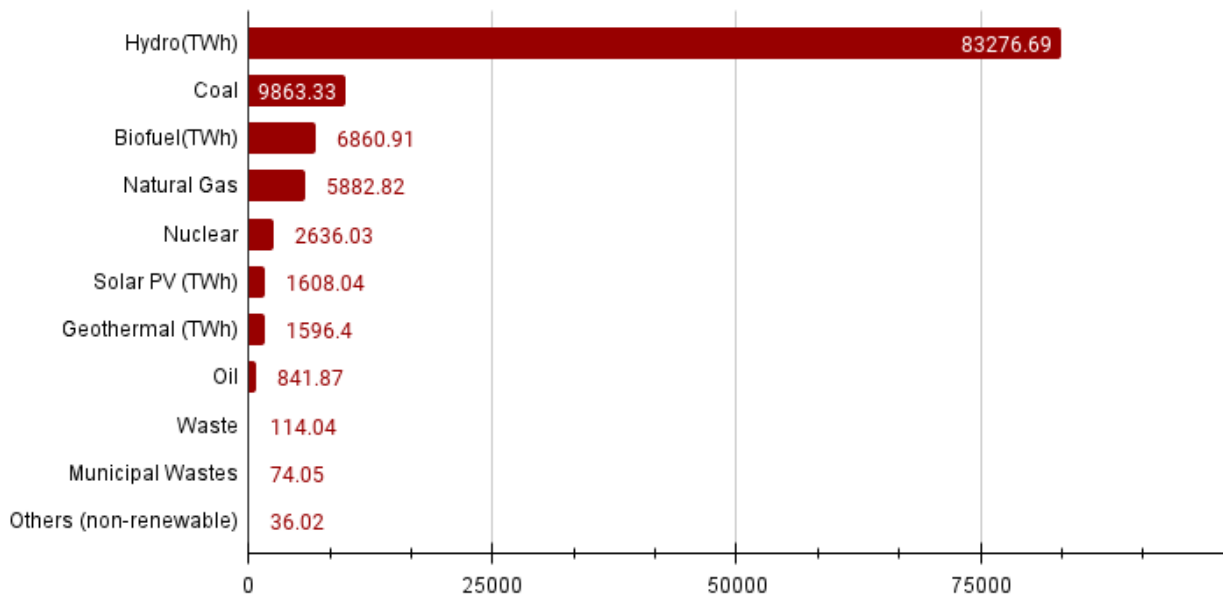
Global power consumption VS power production

Dataset collated between 1990 and 2017



- With respect to the image about, among the multiple mode of power production, Hydro power contributes the most to the global power production.

Sum of Power Contribution (TWh) between 1990 and 2017



Insights and Recommendation

From my findings and observation, I have come to discovered that there is a huge and untapped market in the energy production industry as there is a huge gap between demand for power and the power supplied. Also, there is room to explore more other areas of renewable power production such as Biofuel and Solar PV. Although Coal was next in line however, coal power production on the other hand is not environmentally friendly.

From the data and visualization above I strongly recommend the company to expand its power generation into other unharnessed renewable mode of power production such as Biofuel and Solar PV as a means to provide the ever-growing demand for power in the world.