Project 1 - Final Report

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Energy Consumption Data Visualization

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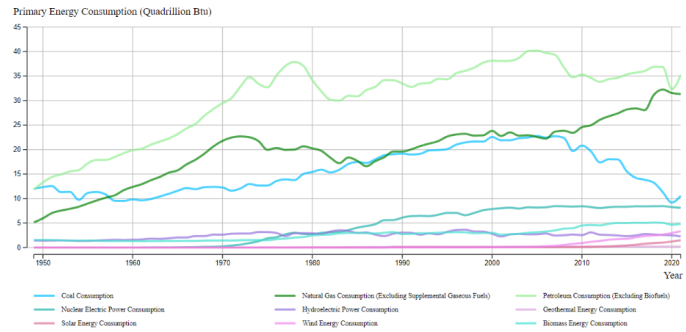
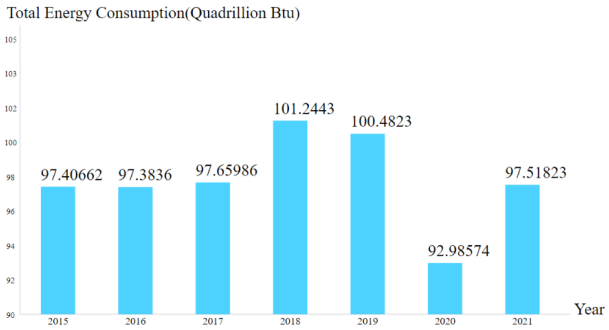
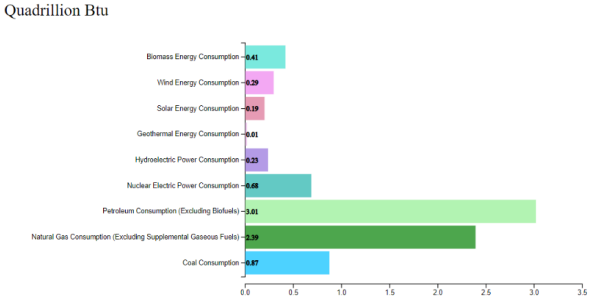
1949-2021 Anuual Energy Consumption



Total energy consumption in the United States from 2015 to 2021



Energy Consumption June 2022



Description of the data

The data we got from U.S. Energy Information Administration, we plotted three energy consumption graphs: different types of energy consumption from 1949 to 2021, total energy consumption from 2015 to 2021, and different types of energy consumption in June 2022

1. Energy consumption from 1949 to 2021
   The line graph visualizes how the energy consumption of different sources has changed over the past 70 years and the insights include a new perspective of looking at the US history and when the country starts shifting to a more sustainable energy model.
   In the 1950s, after World War II, the US entered the cold war against the Soviet Union, and the ambitious development drove the steep rise in energy consumption. Also, the graph reflects the 1970s energy crisis as the petroleum consumption amount fluctuate sharply during the decade.
   When the country entered the new century, coal consumption and natural gas consumption lines went into contradicting directions along with the increase of other clean energy, like wind, solar, and geothermal energy. It is a sign of the change towards a more sustainable society.

2. Total energy consumption from 2015 to 2021
   The chart shows us the total energy consumption in the U.S. from 2015 to 2021. The sum of energy consumption for each year has already existed in the dataset, but there are only 6 months of energy consumption data in 2022, so we do not have a plot of total energy consumption in 2022. This set of data and my plot can clearly see the amount of total energy consumption in the United States in recent years and can directly see the difference between them.

3. Energy consumption in June 2022
   The chart imports the different total energy consumption values in June 2022. The y-axis shows the names of different energies. The x-axis represents the Energy Consumption(Quadrillion Btu). With the emerging clean resource, traditional nonrenewable petroleum consumption is still high. Geothermal energy seems to have huge potential.

Overview of your design rationale

We show the energy consumption by time scale (1949-2022). The audience could perceive the change in energy consumption and predict the future trend of energy usage.

1. Energy consumption from 1949 to 2021
   To effectively present the energy consumption of assorted resources across a long time span, we decided to use an overlay line graph so as to give a straightforward comparison. Channels used included horizontal and vertical positions of points on a line representing amount and year and hues representing different source types.

2. Total energy consumption from 2015 to 2021
   to show the change in total US energy consumption from 2015 to 2021, we decided to use a bar chart. The vertical axis is total energy consumption and the horizontal axis is the year. By

plotting bar graphs of different colors, it is very obvious to see the changes in total energy consumption in different years and the exact number of total energy consumption in each year.

3. Energy consumption in June 2022
   The total energy consumption aims at showing the quantity of energy. The various lengths of rectangles are an effective visual channel to visualize the different quantities of energy consumption, so we chose the bar chart. The horizontal bar chart is more straightforward when showing the different lengths of rectangles.

The story

Through our visualization, we can clearly see the changes in about 9 major energy consumption in the United States in the past 7 decades, the changes in total energy consumption in the United States in recent years, and the consumption of different primary energy sources in June 2020. These graphs convey historical and contemporary information from different yet complementary perspectives. As expected, if the impact of the new coronavirus epidemic in the past two years is excluded, it can be seen that there is a gradual upward trend in energy consumption, which means that the energy consumption of the entire United States has been gradually increasing. Due to the impact of the new coronavirus epidemic that began in 2020, the total energy consumption in the United States dropped sharply compared to 2019, and then as the epidemic slowly recovered, the total energy consumption in 2021 began to increase again. Through our visualizations, what we want to convey is that in addition to the data results that can be directly seen, we can also tell the degree of impact of the new coronavirus on the American economy and people's lives as well as the shift to a more sustainable energy model. This effect can be directly extrapolated from the total annual energy consumption in the United States.

Workload

- Yunqin Wang
  Visualized the first graph of energy consumption of different sources from 1949 to 2021.
  Wrote the report and insights related to the graph.
  I spent about 8 hours in total.
- Yu Yang
  Visualized the Total energy consumption from 2015 to 2021
  Wrote each part of the report that relates to the chart for Total energy consumption from 2015 to 2021 and store part in the report.
  I spent about 1 to 2 hours per day for more than 1 week.
- Ying Zhang
  Visualized the energy Consumption June 2022 Horizontal Barchart
  Formatted team members' codes.
  I spent 5-6 hours finishing it within 2 days.