

ELECTRICITY PRODUCTION AND ENVIRONMENT

This project report analyses the global electricity production from various sources and their impact on the environment. It emphasizes the need to shift towards sustainable energy sources like renewables or nuclear to reduce carbon dioxide emissions and mitigate the environmental impact of electricity generation.

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Data Sources:

[World Bank,](#)

[Our World in Data.](#)

GitHub Repo:

[aaronmj7/Assignment-2-Statistics-and-trends-ADS1](#)

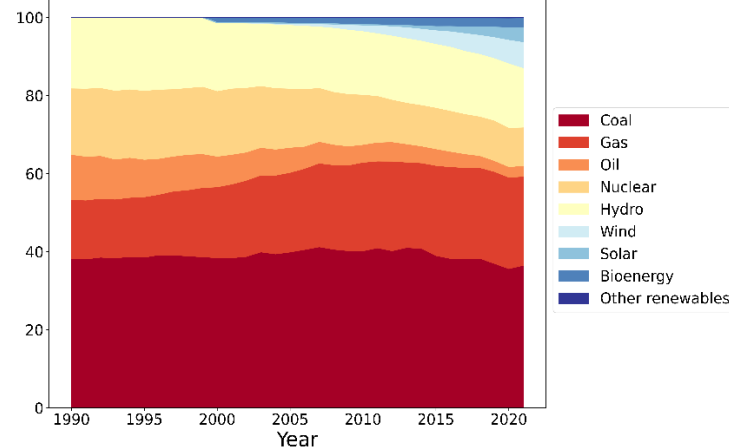
Introduction

Electricity is a crucial component of overall energy production, and it plays a vital role in powering modern society as it powers most of our technological devices, machines, and even transportation systems. As we move towards using electric-powered devices and vehicles for their eco-friendliness, it is essential to consider the origin of electricity that fuels them.

Different Sources of Electricity Production

The area chart illustrates the proportion of electricity produced from various sources globally from 1990 to 2020. We can observe that coal, gas, and oil have been the dominant sources of electricity production for the past three decades, accounting for over 60% of the total energy mix. Meanwhile, production from hydro and nuclear sources has been declining over time. On the other hand, renewable energy sources, including wind, solar, bioenergy, and others, are growing rapidly. Despite their growth, their contribution to the total energy mix remains relatively small even in 2020.

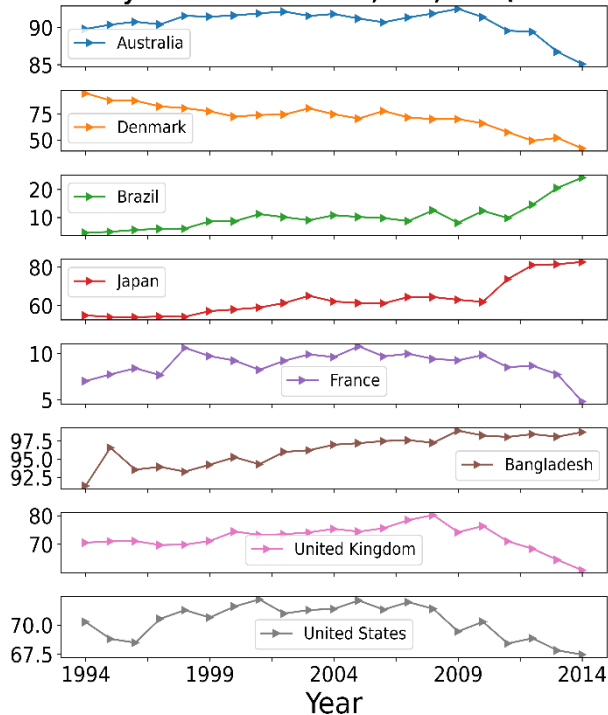
Electricity Produced from each Source (% of total)



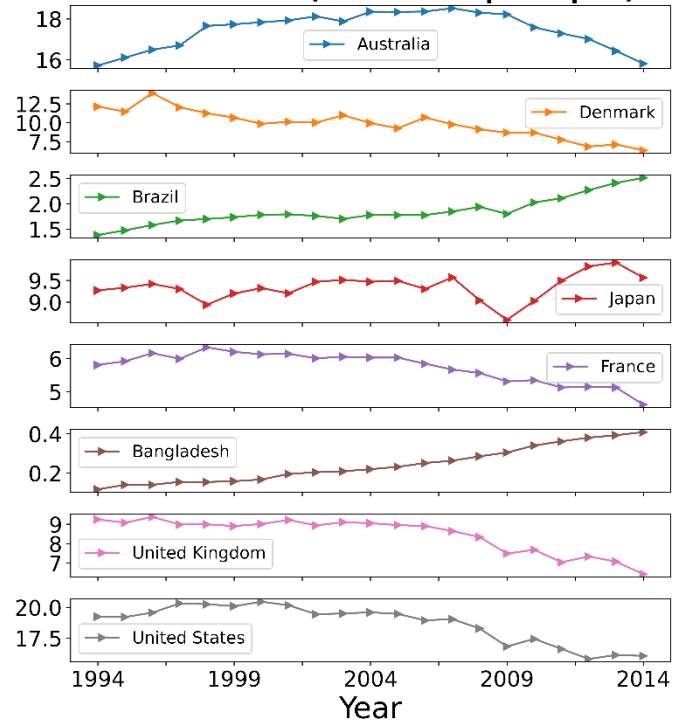
Oil, Gas, and Coal Sources

The following are line plots of the percentage of total electricity generated from oil, gas, and coal sources and the climate change indicator, particularly carbon dioxide (CO₂) emissions measured in metric tons per capita, in eight countries located across different continents from 1994 to 2014.

Electricity Produced from Oil, Gas, Coal (% of total)



CO₂ emissions (metric tons per capita)



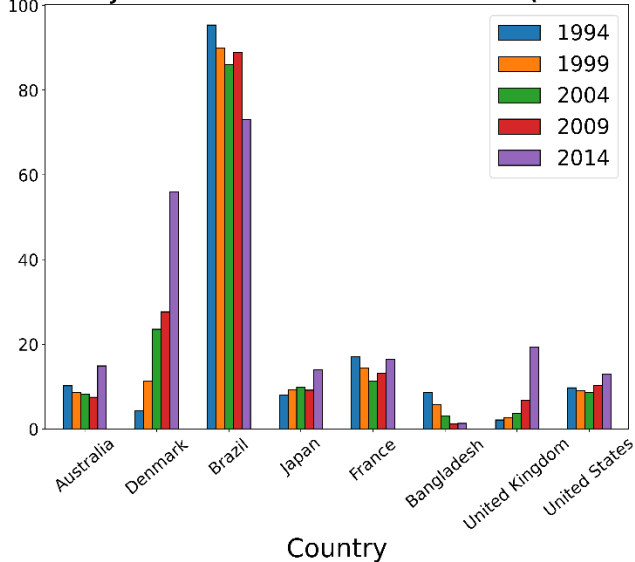
From analysing the two figures, we can see that Australia, Denmark, France, the United Kingdom, and the United States have all witnessed a reduction in their electricity production from oil, gas, and coal sources. Interestingly, a similar decline in carbon dioxide emissions can be observed in these countries. Conversely, Brazil, Japan, and Bangladesh have shown an increase in their electricity production from these sources, which is also evident in

carbon dioxide emission as well. Notably, the line plots of each country are similar irrespective of the indicator. This indicates a strong positive correlation between the percentage of total electricity generated from oil, gas, and coal and carbon dioxide emission. This is because the release of carbon dioxide is a major drawback of electricity production from these sources.

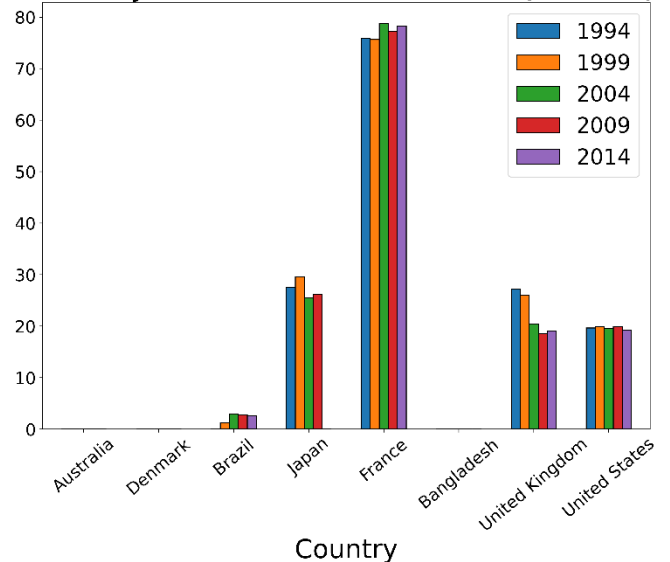
Renewable and Nuclear Sources

Shown below are bar graphs depicting the percentage of electricity produced from renewable and nuclear sources in the eight countries over a five-year span from 1994 to 2014.

Electricity Produced from Renewable Sources (% of total)



Electricity Produced from Nuclear Sources (% of total)



Over the two decades, there was an increase in the proportion of electricity produced from renewable sources in Australia, Denmark, Japan, the United Kingdom, and the United States, while CO₂ emissions decreased for these countries except for Japan. But we can see that electricity produced from nuclear sources is decreasing for Japan. On the other hand, Brazil and Bangladesh have decreased it, but Brazil has still managed to maintain a relatively high percentage. We have seen that CO₂ emissions have increased for these countries over the two decades.

However, France shows a decline in the percentage of electricity produced from renewables until 2004, after which it increases slightly, but still only manages a relatively small percentage. Most of France's electricity comes from nuclear sources, and this proportion increased during the two decades. Australia, Denmark, and Bangladesh produce zero electricity from nuclear sources due to either a lack of availability or the high cost of building and maintaining nuclear reactors. Thus, a negative correlation exists between electricity production from renewable and nuclear sources and CO₂ emissions.

Conclusion

Electricity production plays a vital role in modern society, and the source of electricity is crucial in determining its impact on the environment. Oil, gas, and coal have been the dominant sources of electricity production globally. The observed strong positive correlation between electricity production from fossil fuels and carbon dioxide emissions shows that this gravely affects the environment and we need to reduce their usage and shift towards sustainable energy sources like renewables or nuclear, as observed from their negative correlation with carbon dioxide emission.

In summary, this report emphasizes the significance of transitioning to sustainable sources of electricity production to mitigate the impact of electricity generation on the environment, particularly as our society becomes increasingly dependent on electronic devices and vehicles.