Tracking the impact of key policies o renewable energy growth (US)

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Objective

To analyze how policy interventions in the United States have driven progress in renewable energy adoption and identify areas for further improvement.

How have specific U.S. policies influenced the growth and adoption of renewable energy technologies and energy efficiency measures since their implementation?

Data Sources: World Bank, Kaggle, IEA Policy Database, IRENA, EPA (Environment Protection Agency)

Methods and Steps

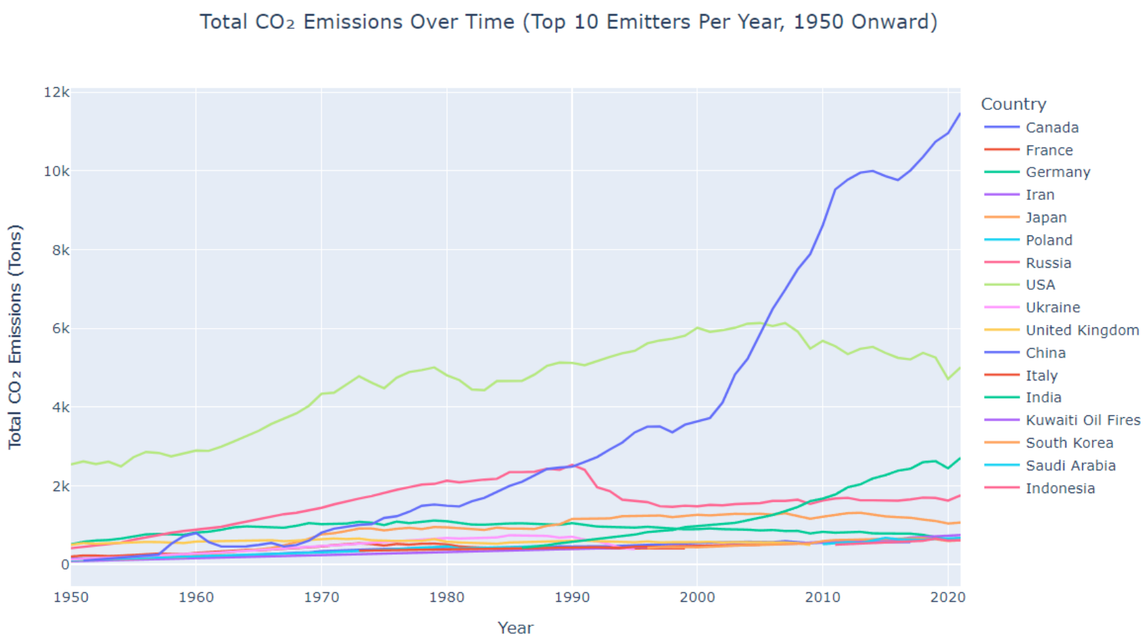
1. Data Analysis – Policy Categorization and Trend Analysis, Key Metrics – Energy Savings, Reduction in GHG, Growth in Renewable Energy.

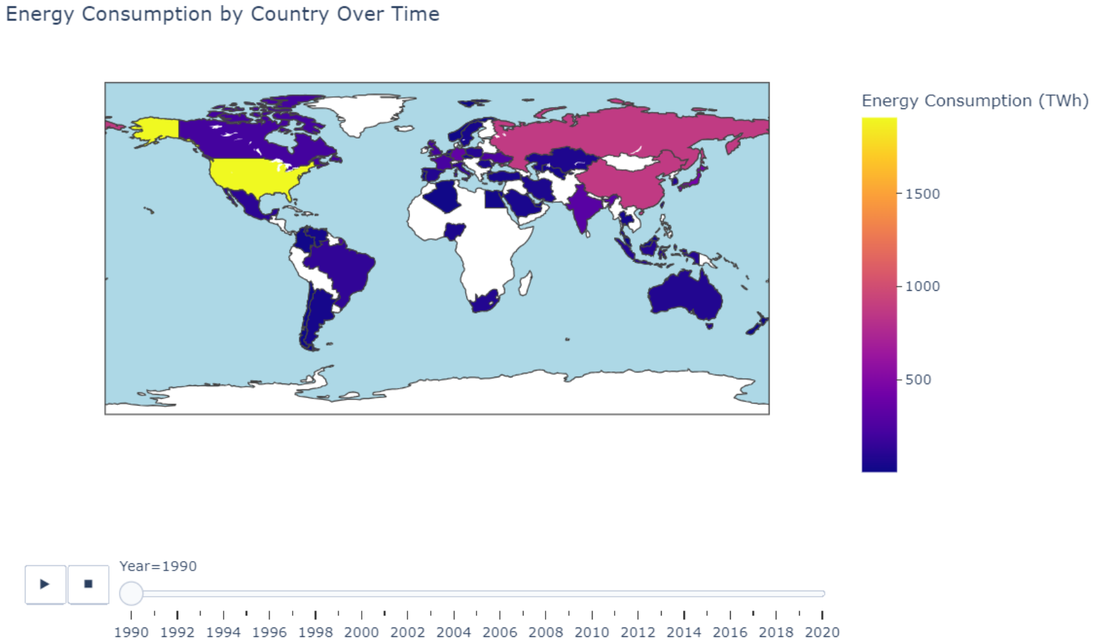
2.Comparative Analysis - types of policies (e.g., subsidies, R&D funding, or efficiency standards)

3.Case Studies – Energy Efficient Mortgages or Clean Cities program (implementation and direct outcomes)

4.Visualization - Timelines or charts linking policy implementation to renewable energy growth or energy savings milestones

Major Energy Consumers over time

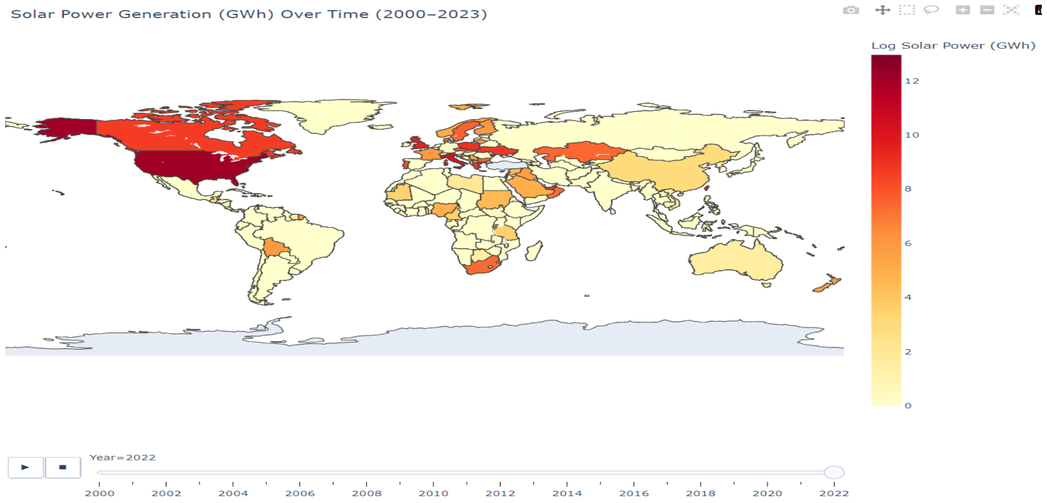


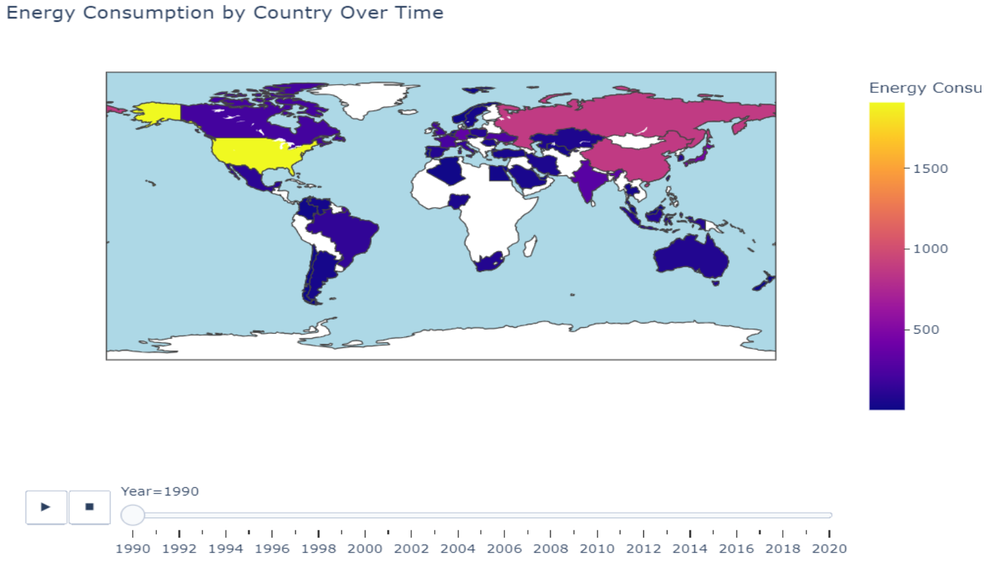


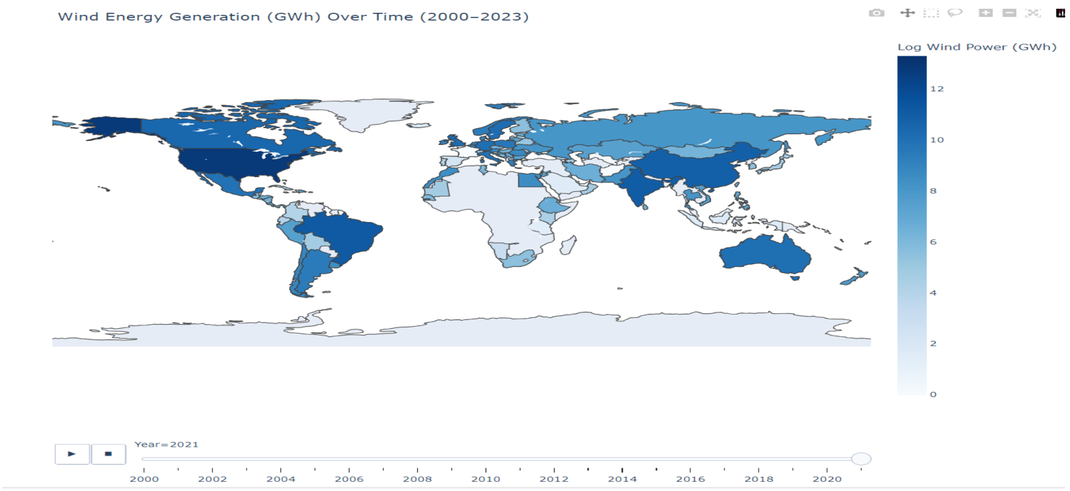
Insights:

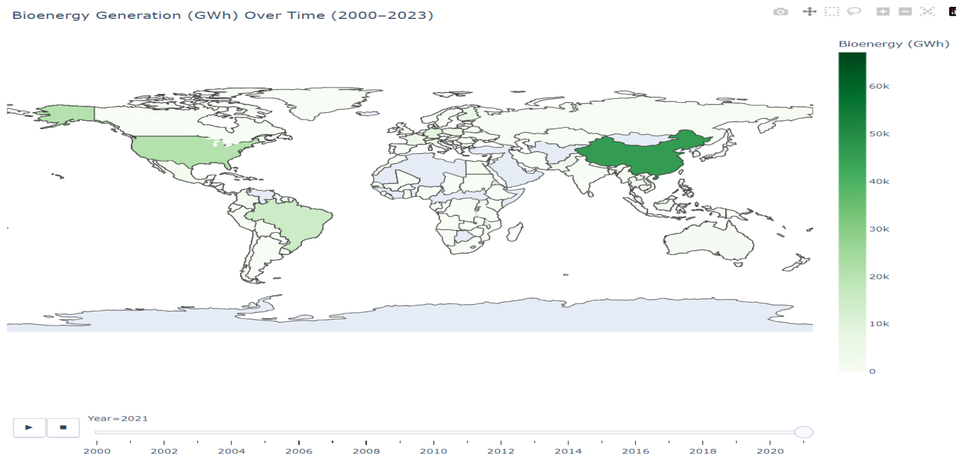
China has overtaken the United States as the leading energy consumer in the last two decades, reflecting its rapid industrialization and economic growth. India, while starting with relatively lower energy consumption, has shown consistent and significant growth. The US is shifting away from GHG Emissions

Major Energy Consumers over time (Map)



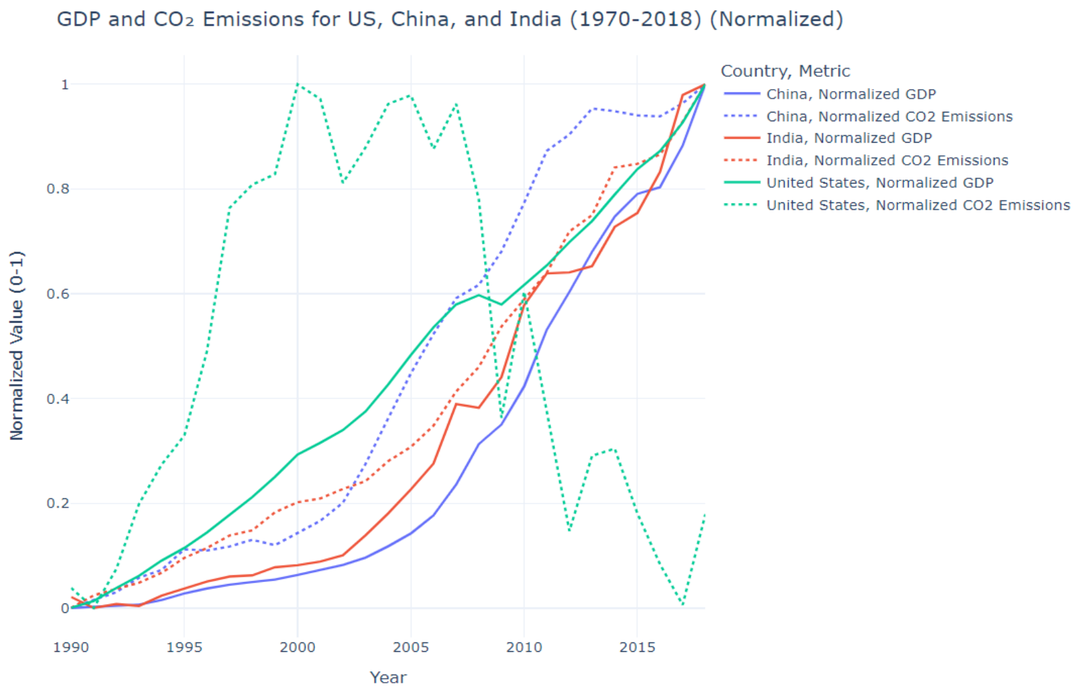


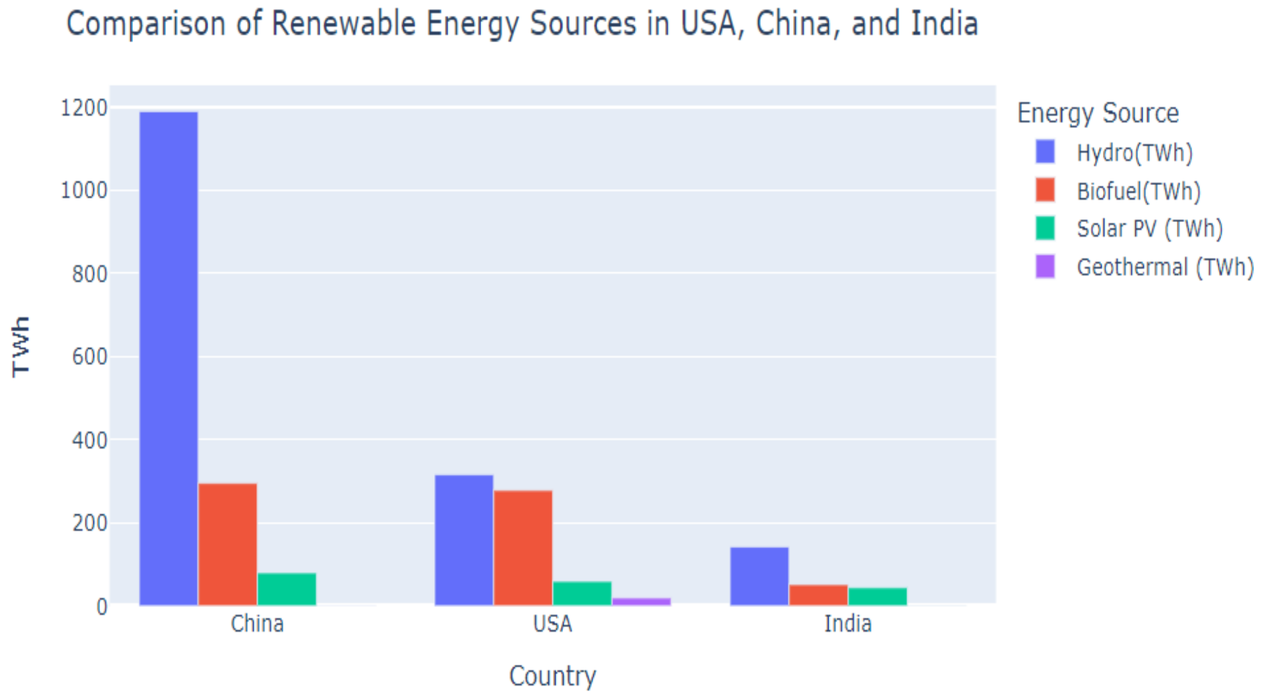




The maps illustrate the global distribution of energy generation, with significant activity in countries like the United States and Brazil and parts of Europe such as Germany and Sweden

Power generation and Trends in Key Variables

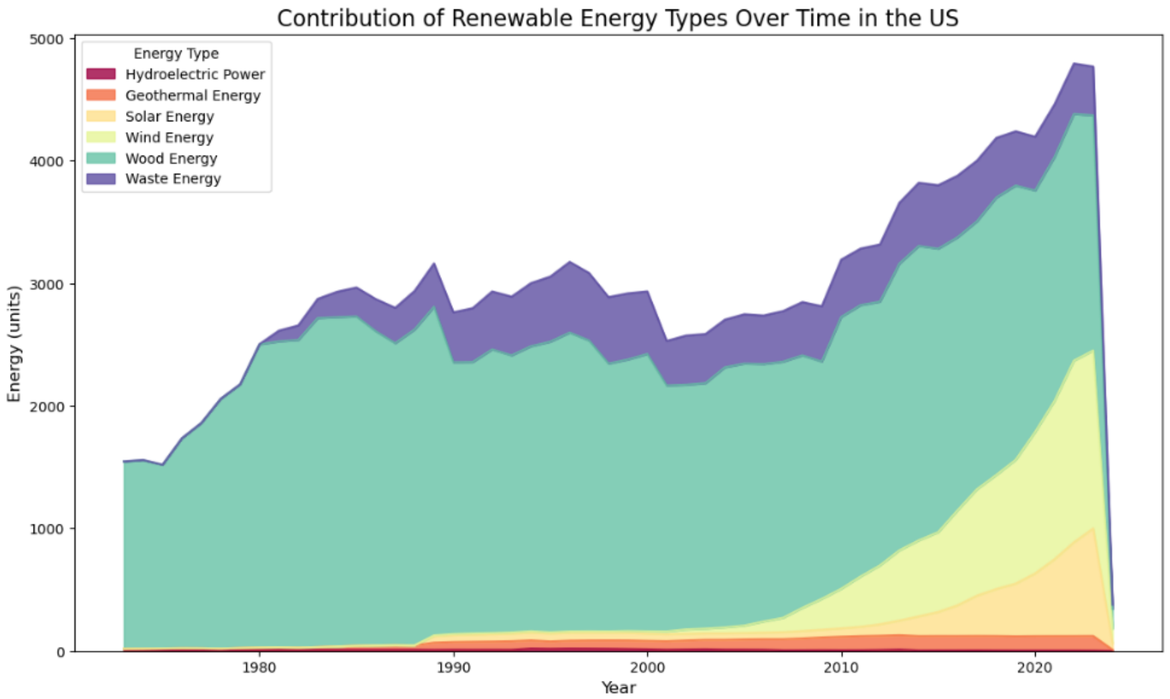


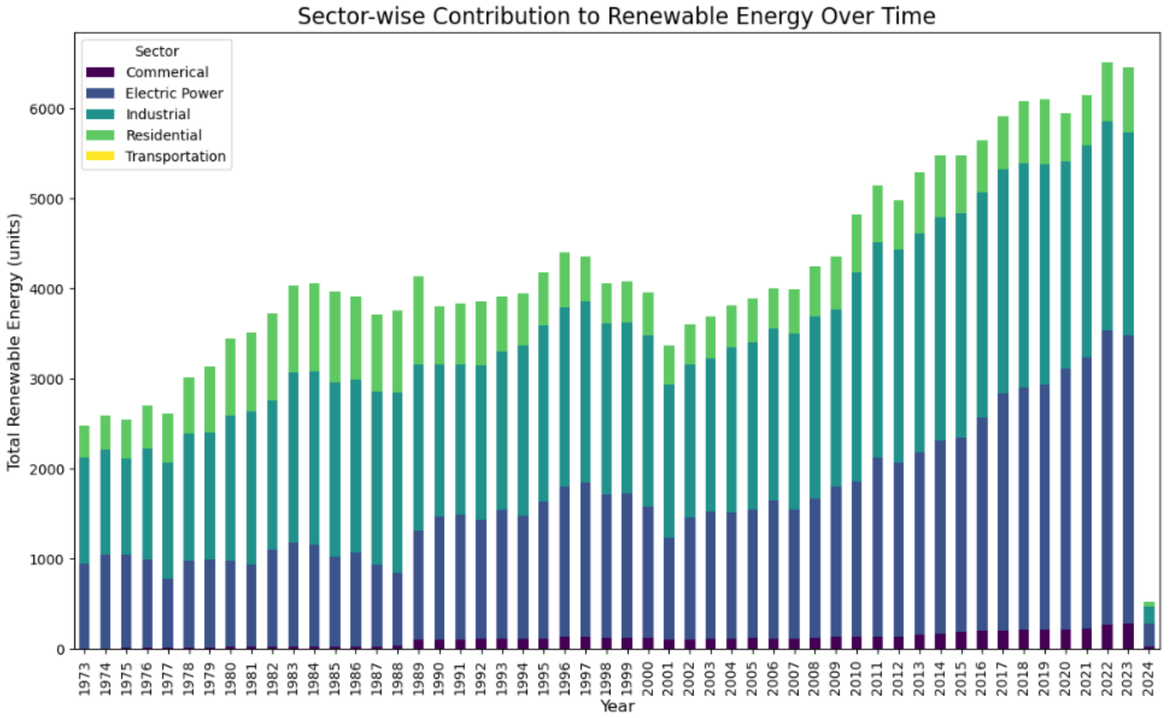


Insights:

China leads in all renewable energy sources except geothermal, while the US is more diversified .

Sector-wise Contribution to Renewable Energy and Trends in Renewable Energy US



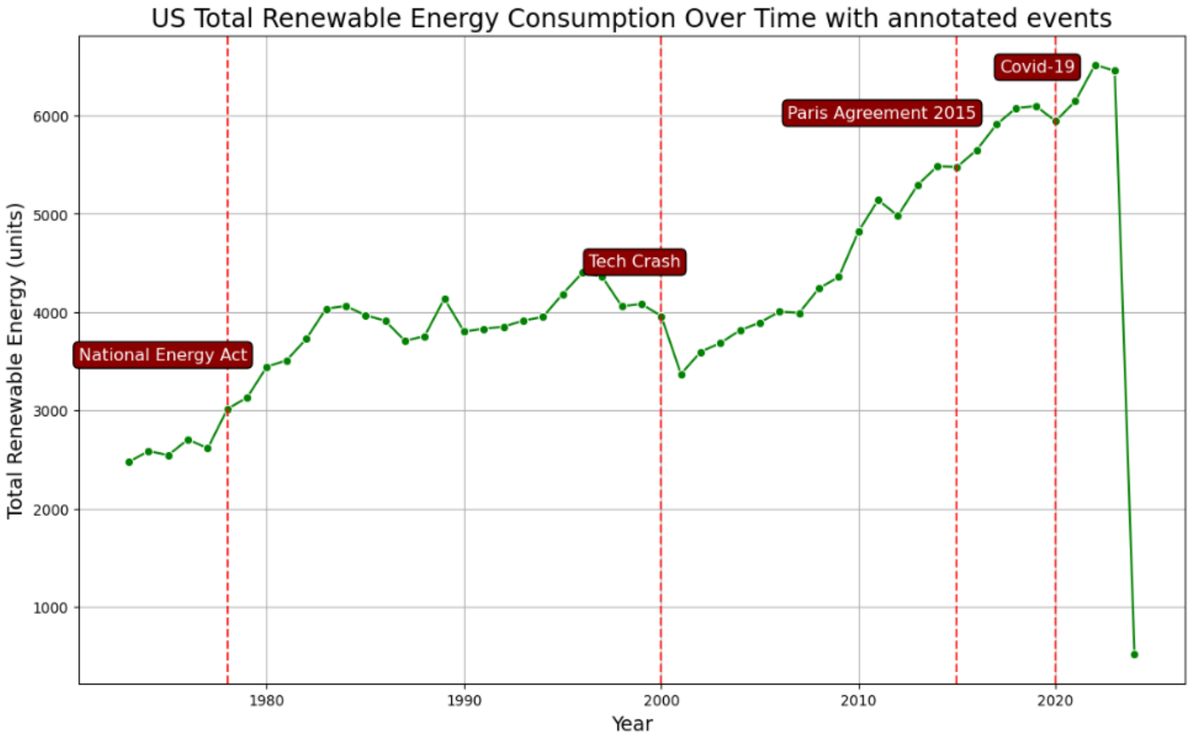


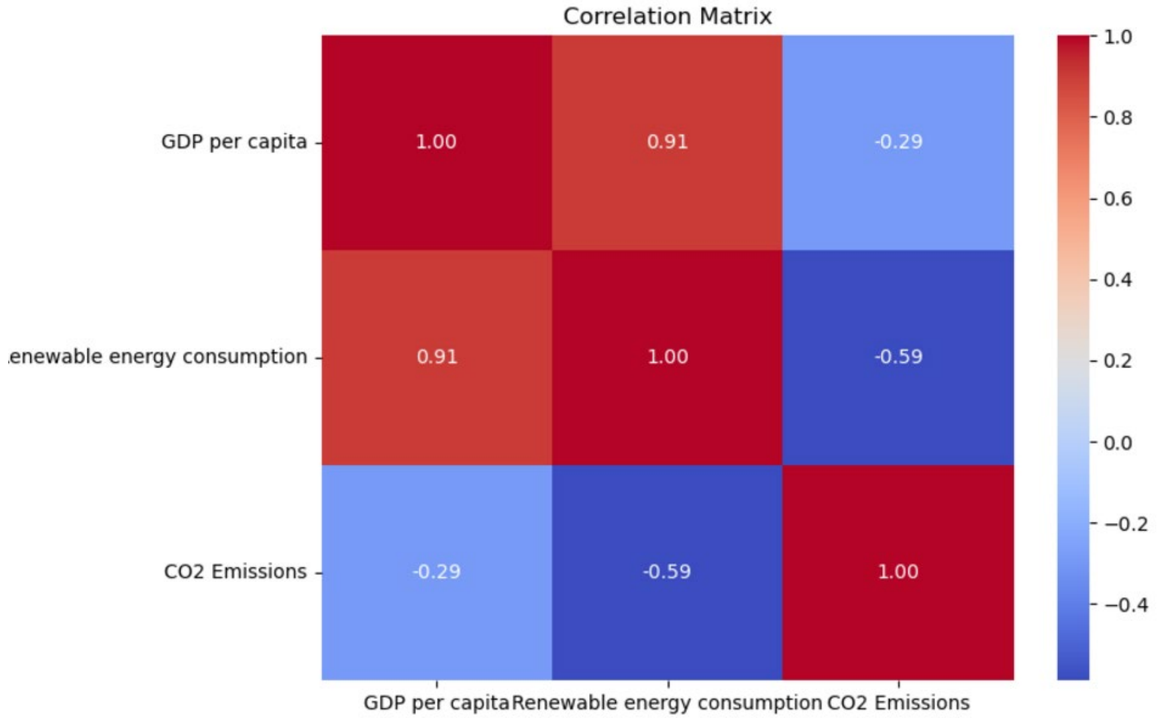
Insights:

The industrial sector consistently dominates renewable energy usage, followed by the Electric power and residential sectors. Transportation has a minimal but gradually increasing contribution, reflecting a slow shift toward renewables in this sector.

Wood energy and waste energy dominated in earlier years but have seen less significant growth. This visualization effectively captures the evolving composition of renewable energy usage in the US.

Trend Analysis of US Total Renewable Energy alongside significant events, as well of Correlation of GDP, Renewable Energy and CO2 Emisisons

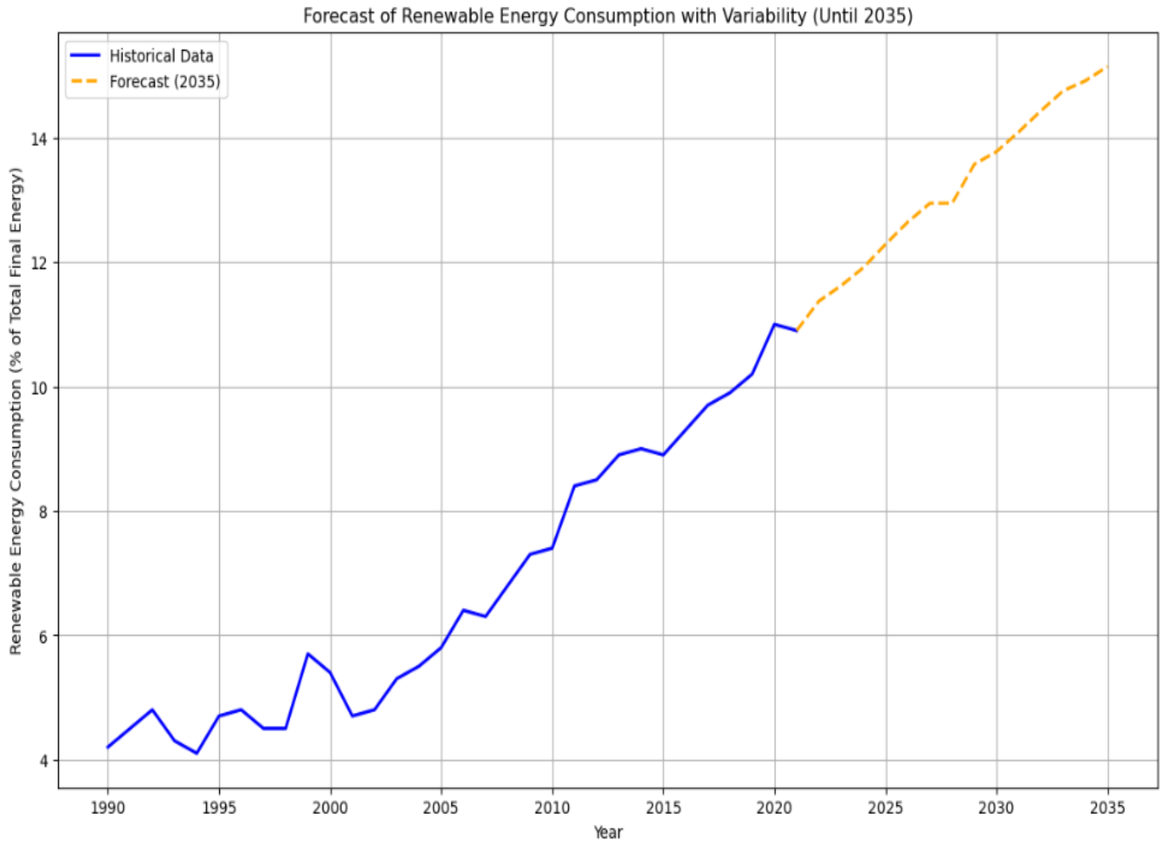


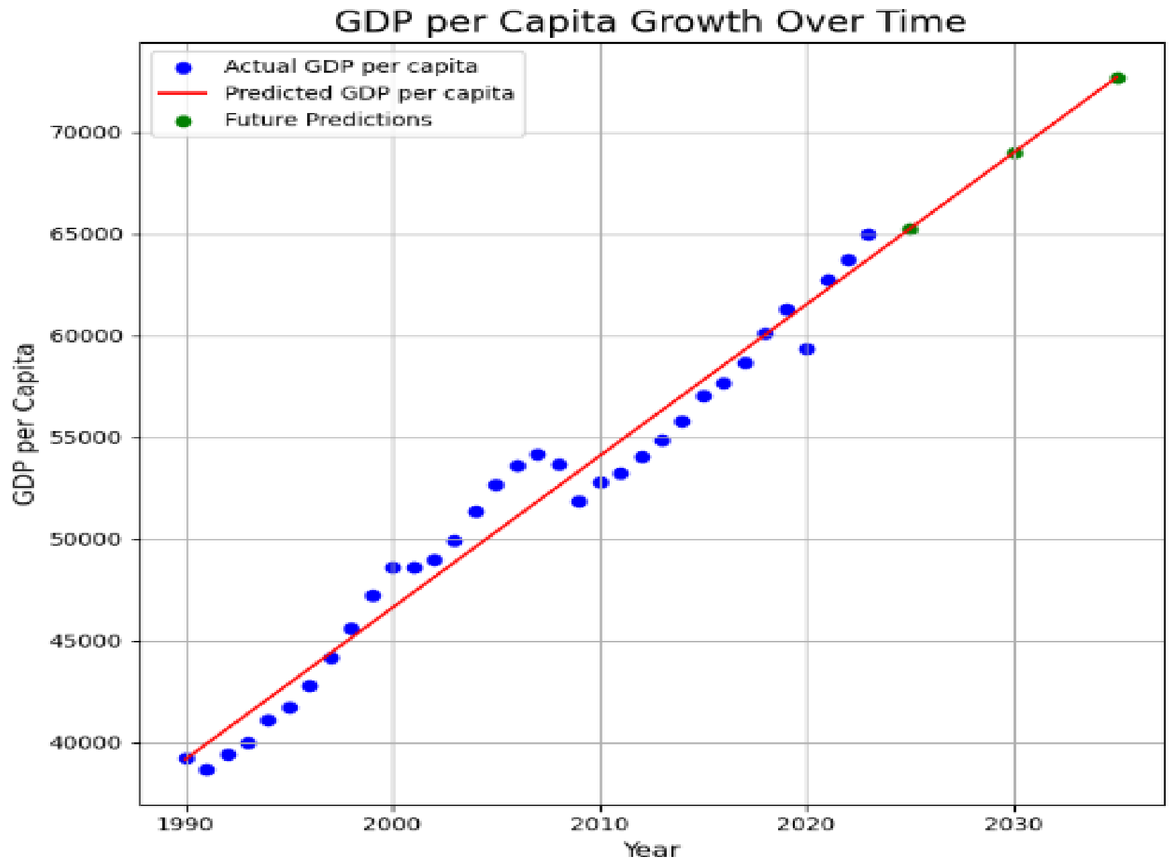


Insights:

The National Energy Act (1978) marks the early push for renewable energy. A drop around 2000 coincides with the Tech Crash, while significant growth is seen post-2015, coinciding with the Paris Agreement. A sharp decline in 2020 reflects the impacts of COVID-19.

GDP per Capita and Renewable Energy Prediction up to 2035





Insights: These visualizations highlight the trends in GDP per capita and renewable energy consumption over time, alongside future predictions up to 2035. Both indicators show a steady growth trend, with predicted GDP per capita reaching approximately $72,710 and renewable energy consumption rising to about 122 units by 2035. The close alignment between actual and predicted values indicates the reliability of the model. This growth suggests continued investments in clean energy alongside economic expansion.

Conclusion

The analysis highlights significant progress in U.S. renewable energy adoption, with steady growth in sectors like industrial and electric power. Policy milestones such as the Paris Agreement and the COVID-19 pandemic have influenced energy trends and emissions. Renewable energy shows a positive link to economic growth and a negative correlation with CO_2 emissions, reinforcing its role in climate change mitigation.

Forecasts project continued growth, emphasizing the need for sustained investment, supportive policies, and innovation to achieve energy sustainability.

Thank you