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Report: Analysis of CO2 Emissions and Renewable Energy Prices

Introduction

This report presents an analysis of CO2 emissions and explores factors influencing these emissions, identifies countries making significant strides in decreasing CO2 output, and predicts future prices for non-fossil fuel energy sources. The data utilized in this analysis is sourced from Our World in Data.

Question 1: Biggest Predictor of CO2 Output

To determine the biggest predictor of CO2 output per capita, various factors such as GDP per capita, population, cars per capita, energy production, and diet emissions were considered. A linear regression model was applied to identify the most influential factors. The resulting coefficients provide insights into which variables have the most significant impact on CO2 emissions.

Figure 1: Coefficients of Factors Influencing CO2 Output

The graph above illustrates the coefficients of different predictors. It is evident that energy production and GDP per capita are the most substantial predictors of CO2 output per capita.

Question 2: Biggest Strides in Decreasing CO2 Output

To determine which countries are making the biggest strides in decreasing CO2 output, the relative CO2 output was calculated, considering both the actual CO2 emissions and population growth. The top 10 countries with the largest decrease in relative CO2 output are visualized in Figure 2.

Figure 2: Top 10 Countries Making Biggest Strides

From the graph, it is clear that certain countries have successfully reduced their CO2 output relative to the global average, indicating significant progress in environmental sustainability.

Question 3: Best Future Price for Non-fossil Fuel Energy

To predict future prices for non-fossil fuel energy, linear regression was applied to relevant columns such as solar, wind, hydro, and bioenergy prices. The predicted prices for solar and wind energy are displayed in Figures 3 and 4.

Figure 3: Future Price Prediction for Solar Energy

Figure 4: Future Price Prediction for Wind Energy

These graphs showcase the predicted future prices for solar and wind energy, offering valuable insights for decision-makers in the renewable energy sector.

Conclusion

In conclusion, this analysis provides valuable insights into the factors influencing CO2 emissions, identifies countries leading in emission reduction, and predicts future prices for non-fossil fuel energy. The linear regression models and visualizations offer a comprehensive understanding of the trends and patterns in global environmental and energy data.
