

ELECTRICITY

PROJECT OVERVIEW

Access to electricity & Energy is particularly crucial to human development as electricity is, in practice, indispensable for certain basic activities, such as lighting, refrigeration, and household appliances, and cannot easily be replaced by other forms of energy.



KEY QUESTIONS

Energy Access and Consumption:

- Energy access and consumption patterns are directly linked, allowing for the categorization of regions for infrastructure development based on their energy access and consumption patterns.

Carbon Emission Forecasting:

- Access to electricity shows a weak to negative relationship with low carbon emissions.

Energy Equity Analysis:

- GDP per capita has a moderate positive relationship with access to electricity and access to clean fuels for cooking.

Renewable Energy Potential Assessment and Investment Strategies:

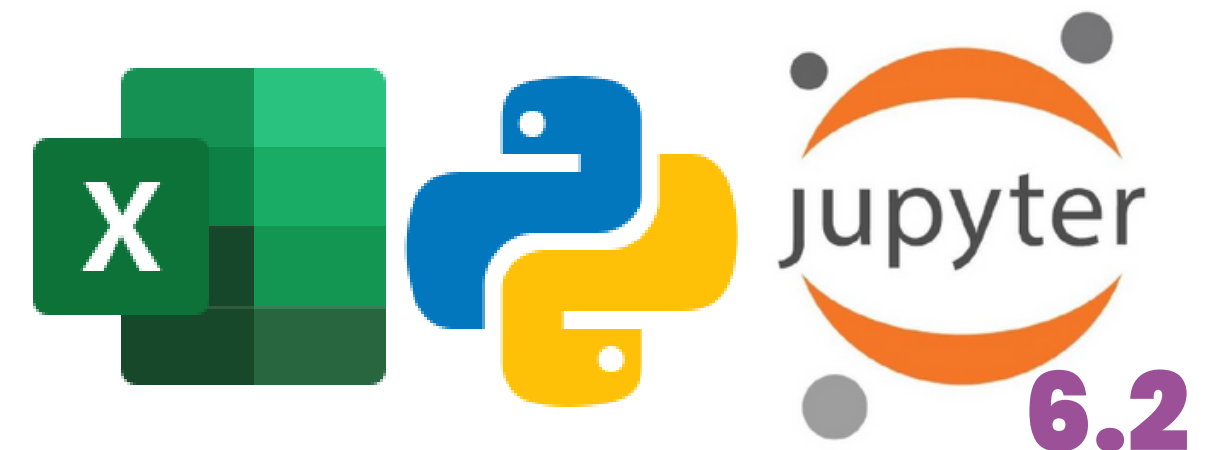
- Renewable energy potential is moderately positively correlated with GDP per capita, and higher usage could reduce overall energy consumption rates.

TOOLS/SKILL

- Python
- Data wrangling & subsetting
- Data consistency
- Data combining & exporting
Deriving new variables
- Grouping data
- Aggregating variables
- Data visualization with Python
- Reporting in Excel

DATA SET

- Electricity dataset provided | via from kaggle.



EXPLORING RELATIONSHIPS

Exploring relationships using heatmap

Variables Analyzed:

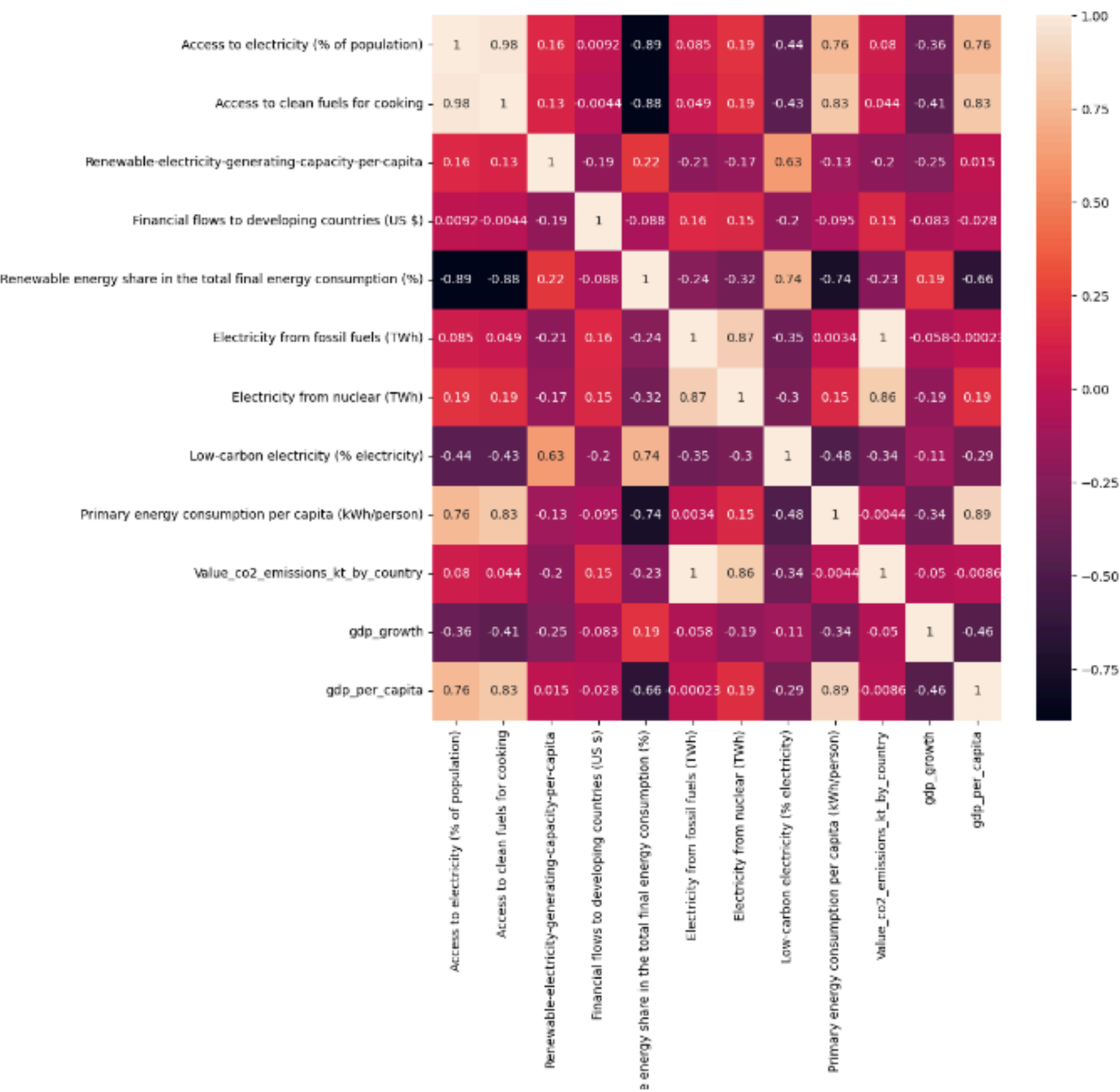
- The analysis considers variables such as **electricity access, clean cooking fuel access, GDP per capita, renewable energy consumption, and carbon emissions.**

Correlation Analysis:

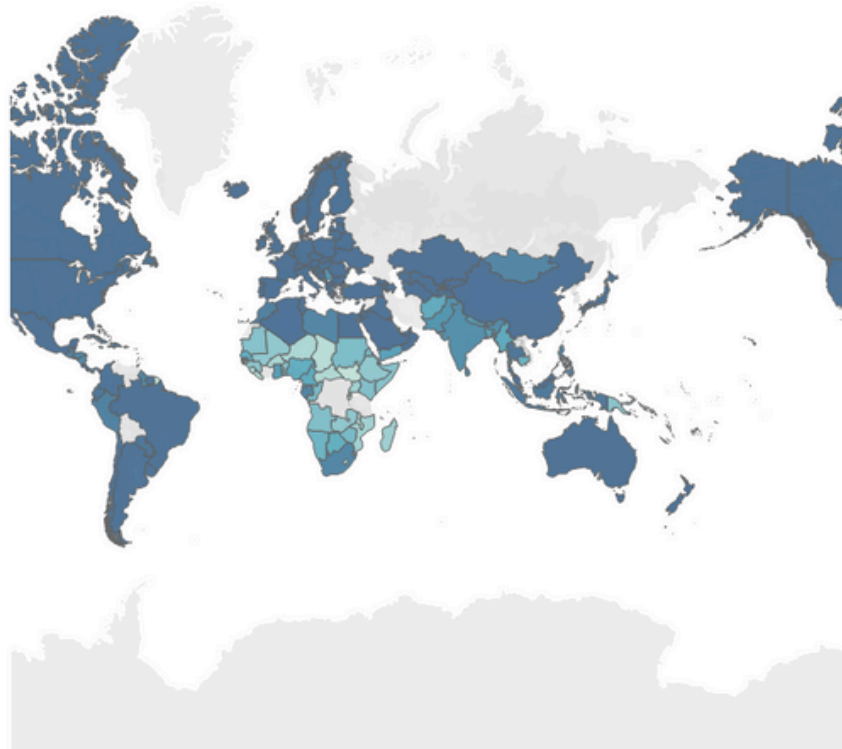
- High GDP per capita correlates with better access to electricity and clean cooking fuels, suggesting wealthier regions have better energy access. However, a negative correlation may exist between electricity access and carbon emissions, suggesting other factors influence these relationships.

Interpreting the Heatmap:

- The heatmap is interpreted using color coding, with warm colors indicating strong positive correlations, cool colors indicating strong negative correlations, and neutral colors indicating weak or no correlation.



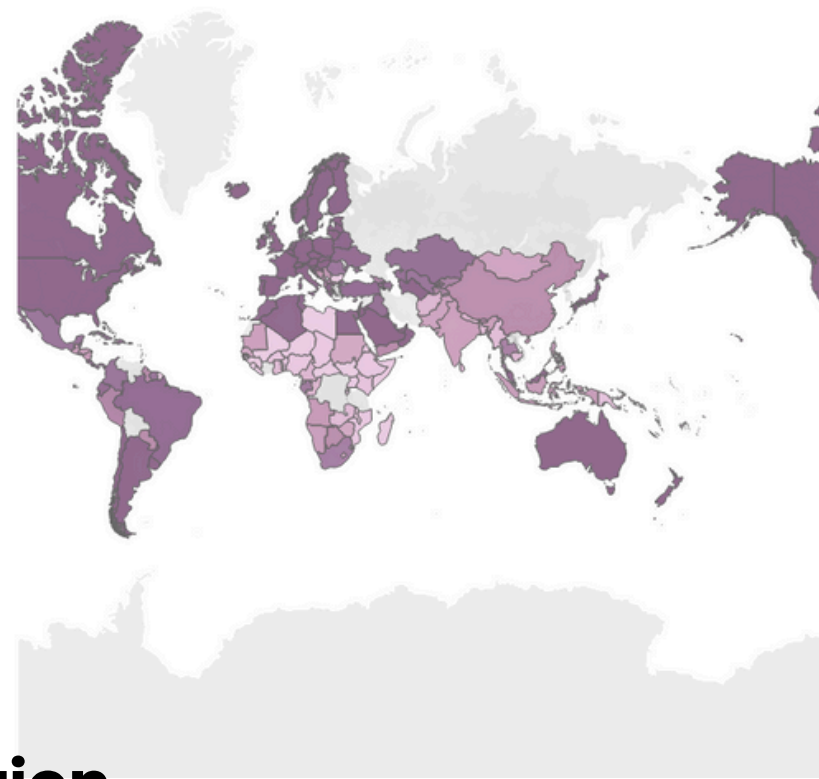
Geospatial analysis of Access to electricity by population across Global



Access to electricity % of the population

- The choropleth map reveals that countries like Gabon, Ghana, and Algeria have a significant percentage of their population accessing electricity, while all South American countries and a good percentage of Asia have access.

Geospatial analysis of Access to clean fuels for cooking by population across Global



Access to clean fuels for cooking

- The choropleth map reveals that only a few African countries, such as South Africa, Algeria, and Gabon, have access to clean cooking fuels, while all South America, Asia, and Australia do.

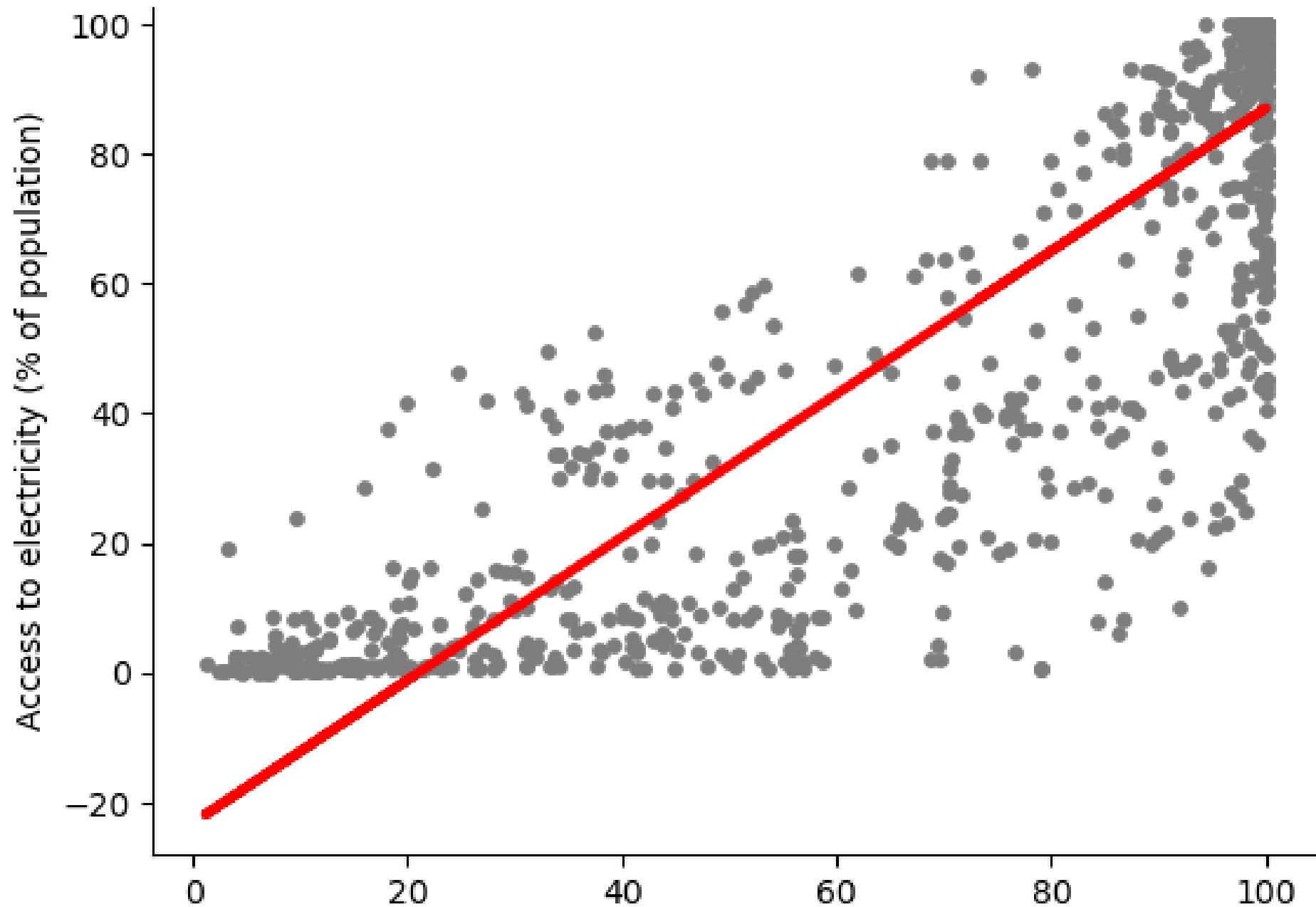
Geospatial analysis of Renewable-electricity-generating-capacity-per-capita by population across Global



Renewable-electricity-generating-capacity-per-capita

- The choropleth map reveals that few South American and Asian countries have low renewable-electricity-generating capacity-per-capita.

LINEAR REGRESSION ANALYSIS



Run Linear Regression:

A linear regression model was trained and predicted on test data, revealing a positive relationship between access to electricity and access to clean fuels for cooking.

Run Linear Regression with Machine Learning

The training dataset shows the model predicts the same outcome as the population with 100% access to electricity and clean cooking fuels.