A graph of a number of clusters

Description automatically generated

A graph showing a number of clusters

Description automatically generated

A graph of a number of blue rectangular bars

Description automatically generated with medium confidence

A diagram of energy consumption

Description automatically generated

COUNT POWER PLANTS

A circle with numbers and text

Description automatically generated

NUMBER OF PLANTS BY STATE

A colorful circle with numbers and text

Description automatically generated

THE MAJOR NUMBER OF

1. An Introduction section that overviews your project, research questions or hypotheses.

Study of the energy generation pattern in the US, and the strategic plan for cleaner energy.

According to the U.S. Energy Information Administration (EIA) survey from May 2023, 42.6% of power plants in the US are solar plants, followed by natural gas at 16.4%. However, natural gas contributes 43.7% of the total energy generation in the US, whereas solar only contributes 6.8%. Additionally, while Texas is the major contributor to energy generation in the US, California boasts double the number of power plants. This study employs unsupervised and supervised Machine Learning (ML) techniques, such as K-Means and K-Nearest Neighbors (KNN), respectively, alongside Geographic Information System (GIS), to analyze the energy generation pattern in the US. Key attributes for clustering analysis include the source of energy, total installed capacity, total energy generated, and geographical coordinates. Notably, one cluster comprises natural gas, nuclear, and coal, with Texas and Florida as top contributors, while California does not rank within the top 10. Remarkably, this cluster contains no renewable energy sources and exhibits the characteristic of the greatest disparity between total installed capacity and total energy generation. Likewise, another cluster comprises wind and solar with Texas and California as top contributors having the lowest disparity between total installed capacity and total energy generation.

Energy Plant generation in the US

Analysis of Power Plant Energy Generation in the United States using Machine Learning and Geographic Information System (GIS)

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there are 3 clusters in which Texas is first in 2 and is second in the

The first cluster, groups natural gas, nuclear, and coal (Texas & Florida) #california is not within the Top 10…

The second cluster, groups wind and solar (Texas & California)

The third cluster, groups natural gas and hydroelectric -low variability of total vs installed – ( California & Texas)

Although Texas is the major contributor to energy generation in the US, California has the double of power plants

Moreover, Texas and California are the greatest contributors of energy generation but

However,

43.7% of energy generation comes from natural gas, whereas solar generates only the 6.8%

1. A Methods section that covers the methodology of your research and/or the method used to collect the data.

Finally, a Results section that summarizes the results of your research, the conclusions and outcomes, and the implications of the research based on your data. If you do not have results at the point of submission, please let us know when you anticipate having data analysis completed.