Report: Insights On Electricity Price Deviation in GB Market

Topic and Technical Approach:

The primary objective of this analysis is to understand the deviation in electricity market prices from 2018 to 2019 and provide valuable insights based on the data provided. To achieve this objective, the analytical software Tableau was used, which is known for its user-friendly interface and a wide range of visualization tools for exploratory data analysis. The primary visualization types used in this analysis were line graphs, stacked bar charts, and bar charts.

By using these visualization types, the analysis reveals some important insights, such as the decrease in wholesale electricity prices by 40% from 2018 to 2019 and the shift towards renewable energy sources. Additionally, the analysis shows a decrease in coal energy production by 60%, while the share of renewable energy increased, suggesting a move away from fossil fuels.

Overall, this analysis provides a comprehensive understanding of the deviation in electricity market prices and highlights the importance of using visualization tools like Tableau to gain valuable insights from complex datasets.

Dataset, Source, Number of Variables, Quality of Data, and Limitations:

The dataset used for this analysis covers the period from 2010 to 2019 and includes data on electricity commodity prices for coal, gas, and carbon, wholesale electricity price and demand from 2018 to 2019, and electricity generation from different sources from 2018 to 2019. The data was collected from a reliable source, and the quality of the data is good, with no missing or inconsistent values.

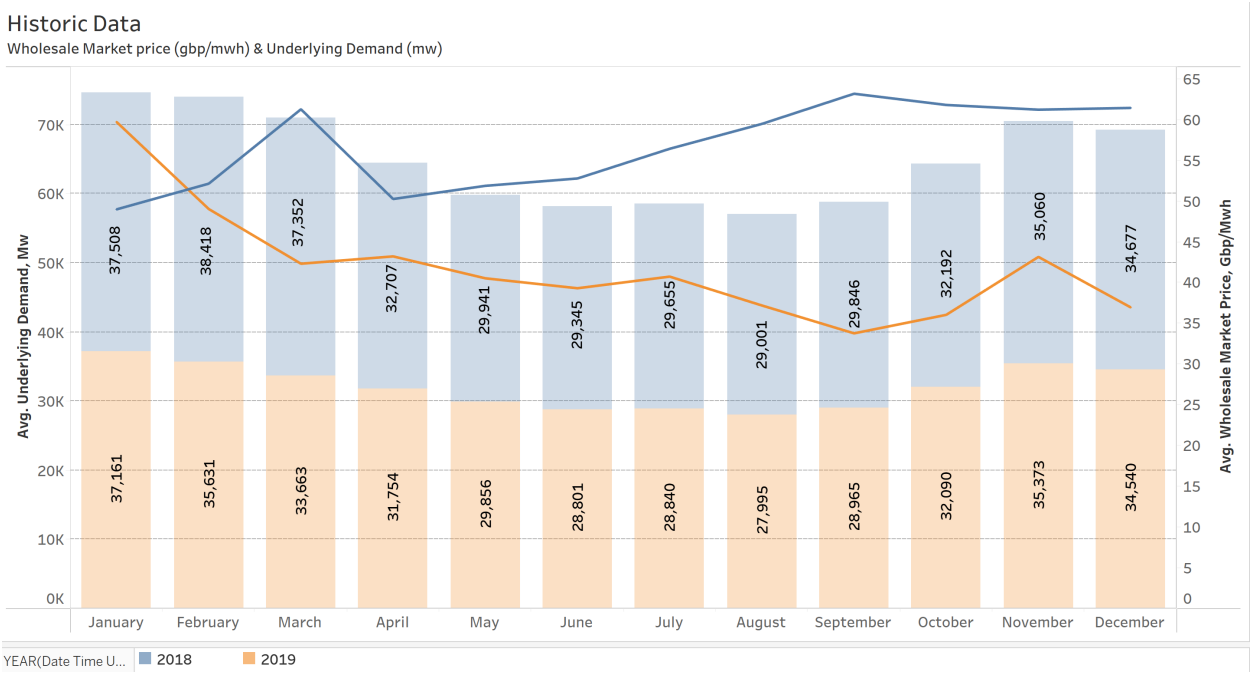
However, it is important to note that the dataset has some limitations. It only covers a specific time, and there may be other factors that impact electricity market prices that are not included in this dataset. For example, weather conditions, geopolitical events, and changes in government policies can all impact the demand and supply of electricity and, therefore, the market prices. Therefore, while the dataset provides valuable insights into the electricity market, it should be acknowledged that the insights gained from the analysis are limited to the data available in the dataset. Further investigation and analysis may be needed to fully understand the complexities of the electricity market and the factors that influence market prices.

Insights from EDA Analysis:

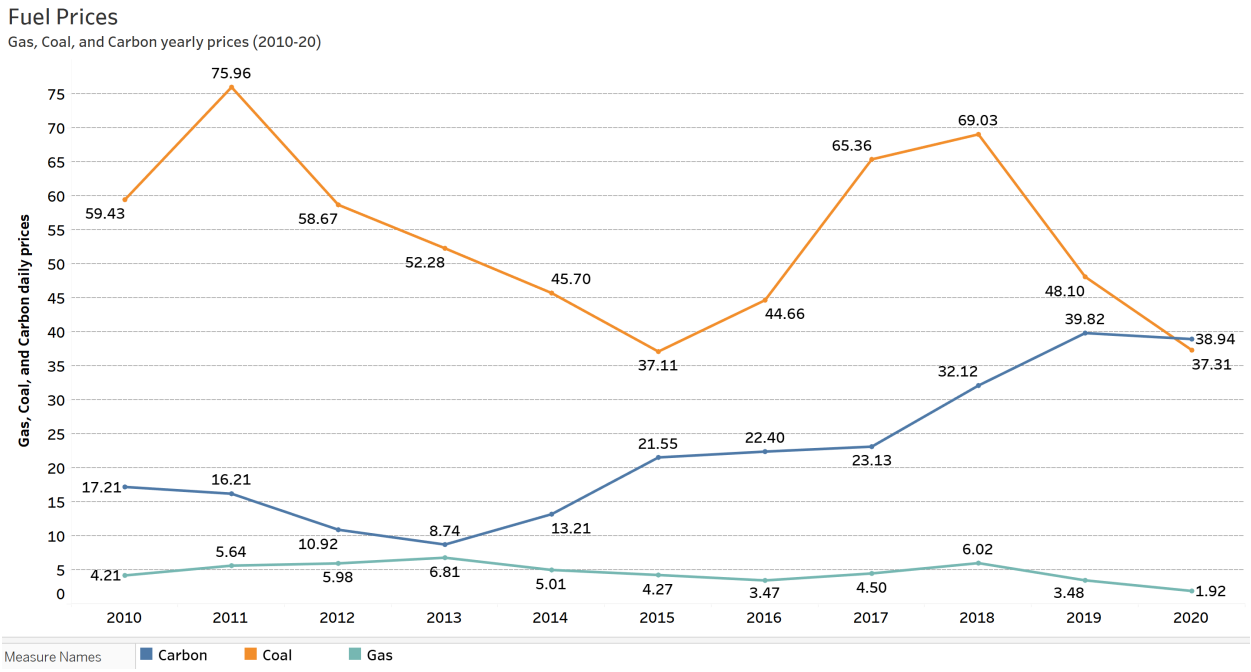
The analysis of the electricity market data from 2018 to 2019 reveals some interesting trends. The wholesale electricity price decreased significantly by 40%, while the demand only decreased by 2.2%, indicating that there was an oversupply of electricity in the market. This oversupply could be attributed to the increase in renewable energy sources and the decrease in coal energy production by 60%. This shift towards renewable energy sources reflects the global trend of moving towards cleaner energy sources.

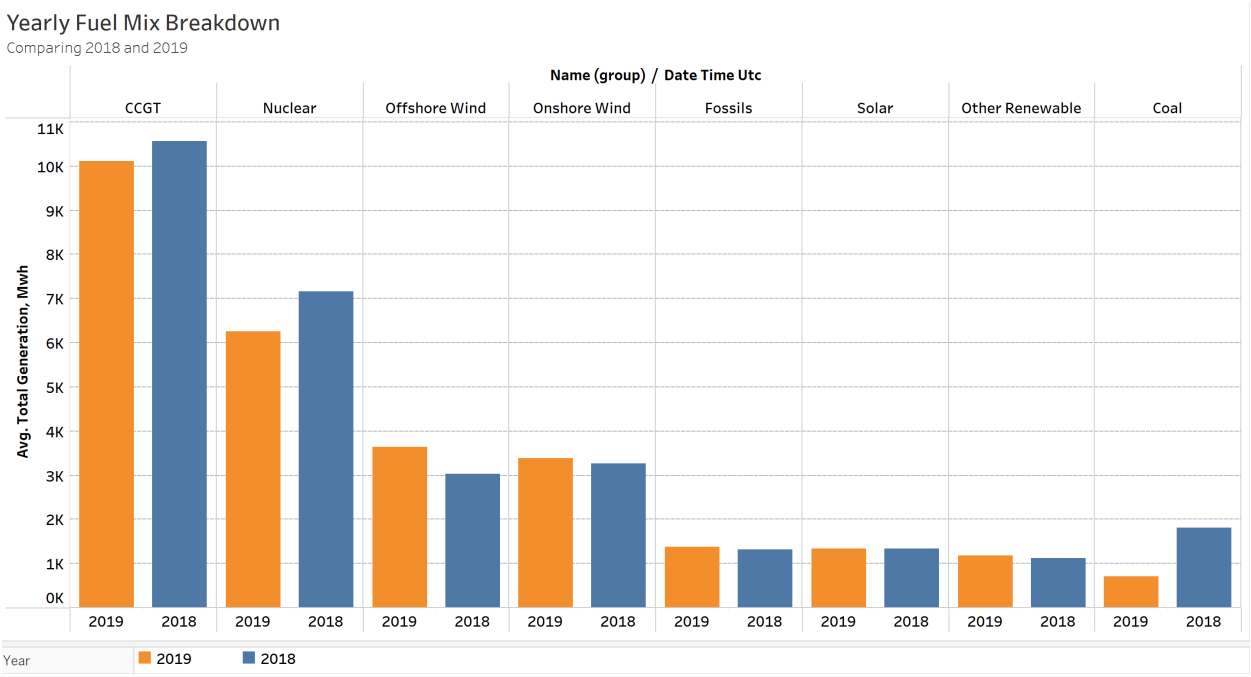
Moreover, the data reveals that there was a slight decrease of 4% in the supply of electricity, which indicates that the oversupply in the market was not due to an increase in supply. Instead, it was primarily caused by the shift towards renewable energy sources and the decrease in coal energy production. This shift in energy sources may have contributed to the decrease in electricity market prices.

Overall, this analysis highlights the importance of investing in renewable energy sources to reduce the oversupply of electricity and create a more sustainable energy market.



The data also shows that coal and gas prices were increasing from 2010 to 2018 but came down by 60% in 2019, while carbon prices steadily increased since 2015. This suggests that there may be a shift towards cleaner energy sources and a move away from fossil fuels, which may be reflected in the decreasing coal and gas prices and increasing carbon prices.





Possible Challenges:

The use of data analytics has become increasingly popular across industries, including the energy sector, due to its potential to provide valuable insights and improve decision-making processes. However, there are several challenges associated with data analysis that must be considered. One such challenge is the limitation of the dataset used for analysis. The dataset used in this analysis only covers a specific time period, and there may be other factors that impact electricity market

prices that are not included in this dataset. This limitation can affect the accuracy and reliability of the insights gained from the analysis.

Another challenge associated with data analysis is the interpretation of the data. While data analysis can provide valuable insights, these insights must be interpreted with caution. The insights gained from the analysis may not necessarily be conclusive and may require further investigation. There may be underlying factors that are not immediately apparent and require additional research to fully understand the results of the analysis.

Finally, the accuracy of the analysis depends on the quality of the data and the accuracy of the analytical software used. The quality of the data used for analysis is critical, and any inconsistencies or errors in the data can affect the accuracy of the insights gained from the analysis. Similarly, the analytical software used must be reliable and accurate to ensure that the results of the analysis are trustworthy.

In conclusion, data analysis can provide valuable insights into the electricity market, but it is essential to consider the limitations of the dataset, the interpretation of the data, and the accuracy of the analytical software used. By acknowledging these challenges, analysts can ensure that the insights gained from the analysis are accurate, reliable, and can inform informed decision-making processes.

Future Work:

1.Further analyze the impact of renewable energy on electricity prices: The analysis in this study suggests that there has been a shift towards renewable energy sources, which could be a contributing factor to the decrease in wholesale electricity prices. However, this relationship could be explored in more depth. For instance, a time-series analysis could be performed to investigate the causal relationship between renewable energy production and electricity prices, while controlling for other factors.

2.Examine the impact of government policies on electricity prices: Government policies such as subsidies or taxes can have a significant impact on electricity prices. Future work could investigate how changes in government policies may have affected the electricity market and explore potential policy changes that could further incentivize renewable energy adoption.

3.Compare the electricity market in different regions or countries: This analysis focused on the electricity market in a specific region, but electricity prices can vary greatly depending on location. Future work could compare electricity markets in different regions or countries to identify similarities and differences in the factors that drive prices.

4.Incorporate machine learning techniques: While Tableau is a powerful visualization tool, it is limited in its ability to perform advanced analytics such as machine learning. Future work could incorporate machine learning techniques such as regression or clustering to gain further insights from the data.

5.Investigate the impact of extreme weather events on electricity prices: Extreme weather events such as hurricanes or heatwaves can have a significant impact on electricity demand and supply, which can in turn affect prices. Future work could investigate how extreme weather events have impacted electricity prices in the past and explore potential strategies for managing price volatility during such events.