DATA GEEKS

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CAN ELECTRICITY CONSUMPTION PATTERNS TELL US ANYTHING ABOUT THE PANDEMIC?

TEAM MEMBERS

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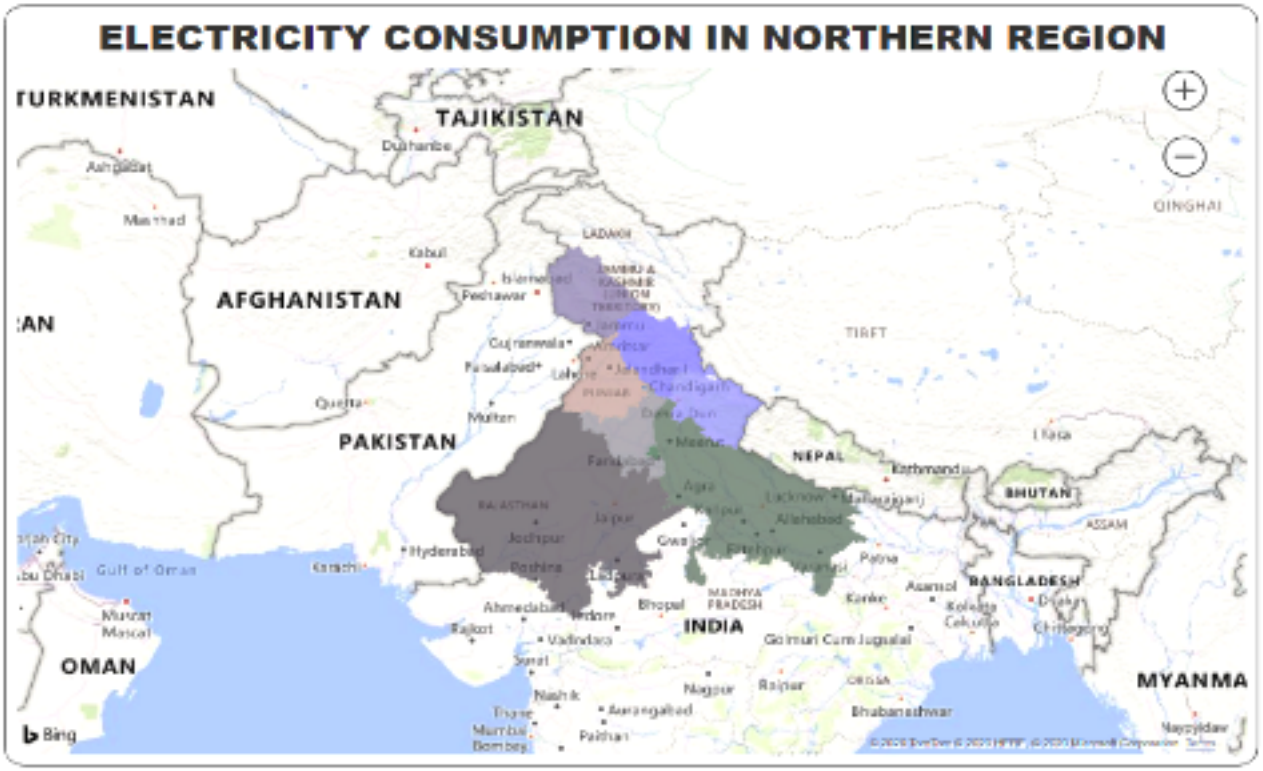

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1. INTRODUCTION

India is ranked third in the world for the production and consumption of electricity. As of March 31, 2020, the national electric grid has a connection to the capacity of 370.106 GW, in India. In the fiscal year 2018-2019, the total generation of the electricity by utilities in India was measured to 1,372 TWh whereas the total generation by utilities and non-utilities was 1,547 TWh. The total consumption of electricity per capita was 1,181 KWh.

The current pandemic scenario (COVID-19), has positively or negatively impacted the economic activities in every sector. These impacts were caused due to the restrictions implied on stepping out of respective households during the months of March, April and May.

As for the country, the consumption of electricity is pivotal, therefore we planned to study the impact of COVID-19 on electricity consumption state-wise and in the northern parts of India.

2. DATASET

Data is in the form of a time series for a period of 6 months beginning from 1st Dec 2019 till 6th May 2020.

We have taken Two Datasets: -

In the first Dataset Rows are indexed with dates and columns represent states.

In the Second Dataset putting both Rows and columns, we get a data point for each row which reflects the power consumed in Mega Units (MU) by the given state (column) at the given date (row).

Conversion Of 1 Mega Unit/ 1 Million Unit/ 1MU is as Follows

1 Mega Unit = 1Million Unit = 10,00,000 Units

1Unit= 1000Wh = 1kWh

The dataset has been Collected from Kaggle. The Dataset was already scraped from the POSOCO site. [https://www.kaggle.com/twinkle0705/state-wise-power-consumption-in-india]

Power System Operation Corporation Limited (POSOCO) is a wholly-owned Government of India enterprise under the Ministry of Power.

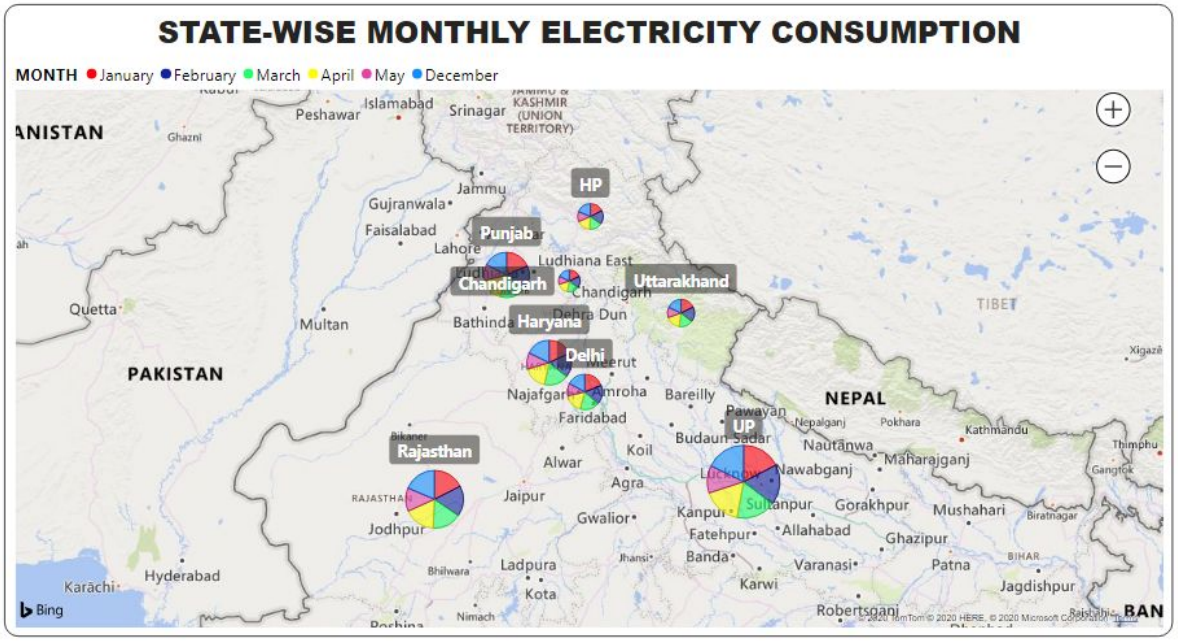
3. METHODOLOGY

The below-mentioned process was carried out using jupyter lab and other dependencies. After Data Cleaning and Wrangling, the next step performed was Data Analysis using Microsoft Power BI Desktop.

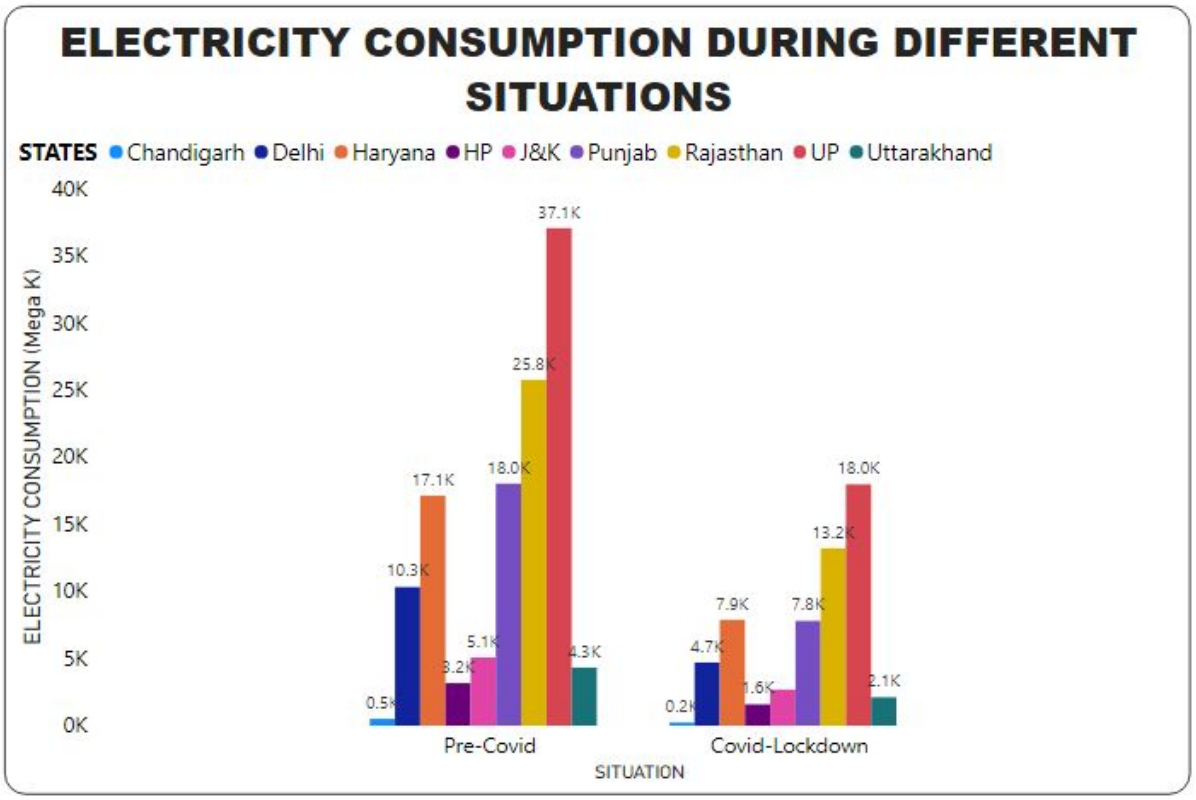
3.1 Data Cleaning and Data Wrangling

After Collecting the Dataset from POSOCO, the team assigned Pre-Covid and Covid Lockdown Labels for better understanding of the Electricity Consumption. In the Dataset, a label named season is also considered for analysing season-wise consumption of a state.

3.2 Visualisations



For our research, we have Studied the northern parts of India and data on electricity consumption was accumulated in these regions. The Northern Region includes Uttar Pradesh (UP), Rajasthan, Punjab, Haryana, Delhi, Chandigarh, Jammu & Kashmir, Himachal Pradesh(HP), and Uttarakhand. In these regions, it has a total of 6 States and 3 Union Territories which also have Capital Delhi as well.

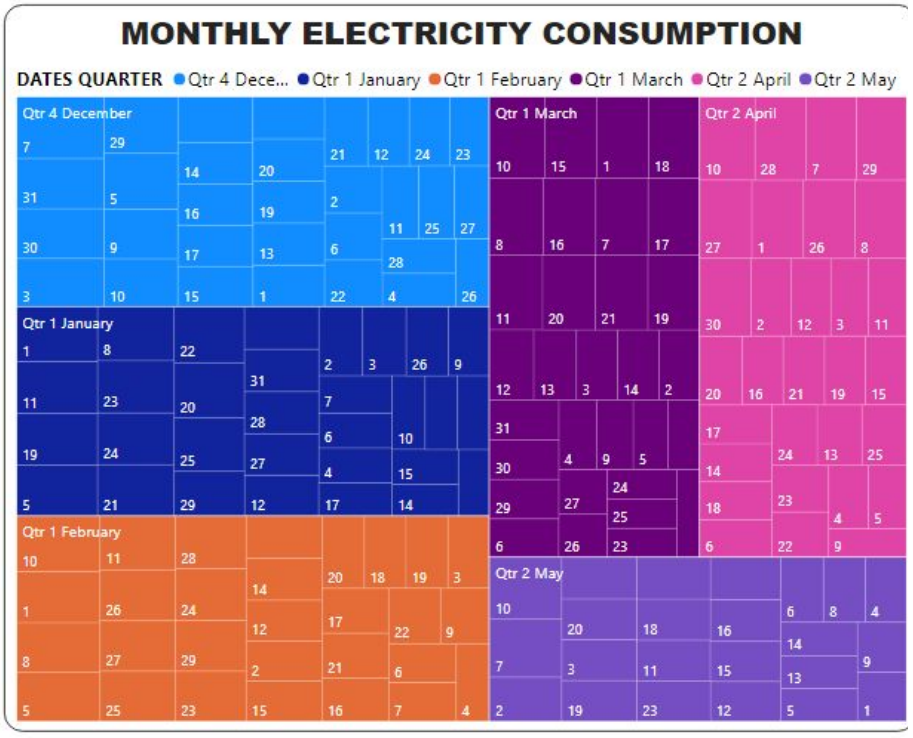


The Clustered Column chart above illustrates the difference in monthly utilisation of electricity in Pre-COVID and during the lockdown in the northern regions of India specifically Haryana, Delhi, Punjab, Rajasthan, Uttar Pradesh, Jammu & Kashmir, Chandigarh, HP and Uttarakhand.

The figure shows that there was vast depletion in the consumption of electricity during the COVID-lockdown than pre-COVID. The plausible reason could be the shutting down of the majority of offices and industries, schools and colleges, tourism and transportations like metro, railways etc that contributes to the majority of electricity consumption.

In the industrial sector, manufacturing of non-essential goods was increased by the government during the lockdown and international as well as interstate and intrastate transportation was restricted, that explains the major decline in the amount of electricity usage.

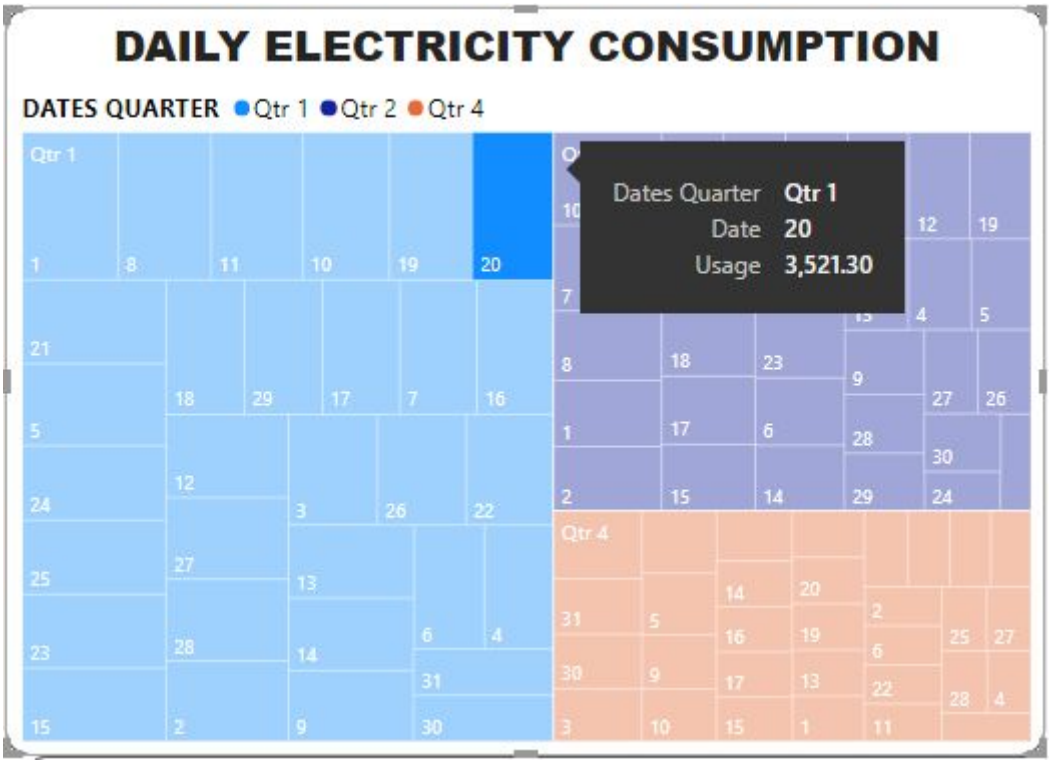
3.2.1. QUARTER TO DATE (QTD)



This Heat Map illustrates how much monthly electricity utilization has been done during the covid and pre-covid conditions. It also represents the quarterly consumption during the same period.

Quarter to date (QTD) is a time interval that captures all the electricity consumption that occurred between the beginning of the current quarter and the point at which the data was gathered later in the quarter. It is a period starting at the beginning of the current quarter and ending at the current date.

In Quarter 1, maximum usage of electricity has been observed that is approximately 94720 kWh.

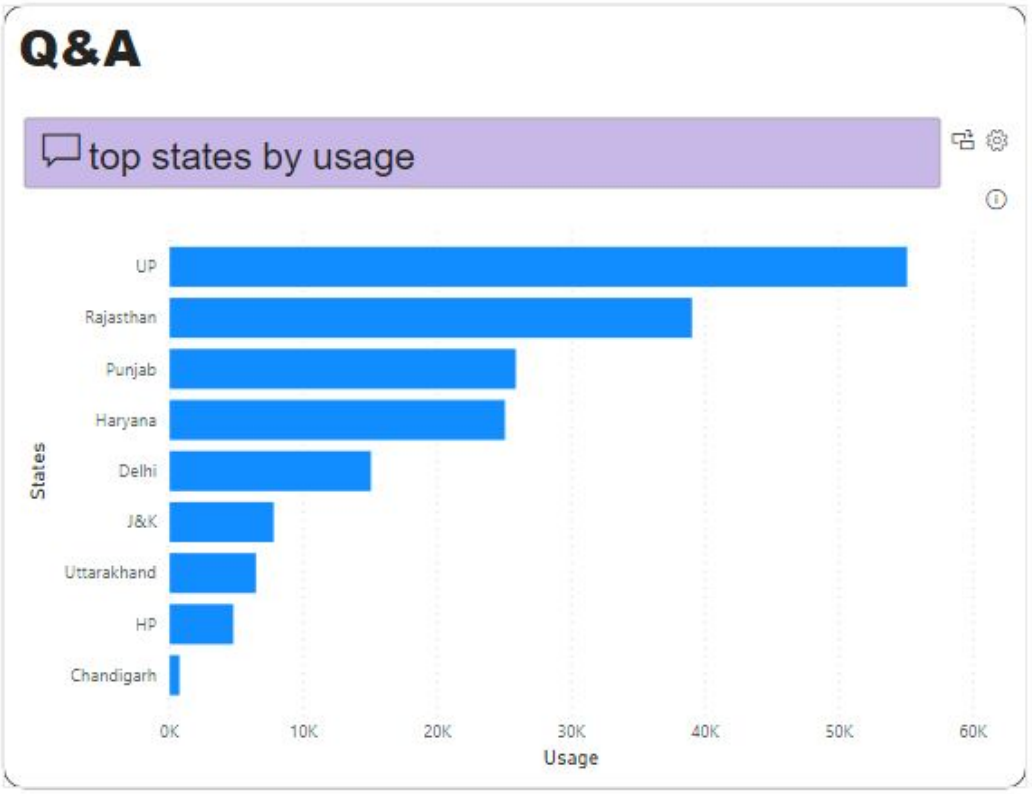


The Quarter to Date electricity consumption is derived in the figure above. We have considered only one observation for Date: 20/12/2019 where the electricity usage is 3521.30 kWh in the first quarter.

4. CHALLENGES

- Could not gather detailed information and data about the individual energy consumption of industries, offices, households etc.

5. CONCLUSION



The study above shows the variances in the demand for electricity in different parts of north India before and during the lockdown period due to the effects of COVID-19. We see how the impact of lockdown has changed the behaviour of electricity usage momentarily. The daily consumption of electricity in all the northern parts of India was reduced by approximately 50% during the lockdown. Apart from other factors that have severely impacted the economy of the country, reduction in energy consumption has contributed to a certain extent as income for electricity providers have reduced.

6. REFERENCES

[1] World Bank Blogs. 2020. *India's Electricity Consumption Data Shows Economic Impact Of COVID-19*. Viewed 18 October 2020. <https://blogs.worldbank.org/endpovertyinsouthasia/indias-electricity-consumption-data-shows-economic-impact-covid-19>

[2] En.climate-data.org. 2020. Indian Climate: Average Temperature, Weather By Month & Weather For India - Climate-Data.Org.viewed 18 October 2020. <https://en.climate-data.org/asia/india-129/>