Tech Saksham

Case Study Report

Data Analytics with Power BI

ANALYSIS OF ELECTRICITY CONSUMPTION IN INDIAN STATES

The M.D.T Hindu College

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ABSTRACT

The objective of this proposed project, “Analysis of Commercial electricity consumption in Indian states” using data analytics with Power BI is to analyze electricity usage patterns and identify factors influencing energy consumption in different regions. By leveraging data analytics, the aim is to gain insights that can help in developing strategies for more efficient energy management and promoting sustainability in commercial electricity consumption across various Indian states. By leveraging Power BI, the aim is to gain insights into commercial electricity consumption across different Indian states to drive informed decision-making and promote energy efficiency.

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

The problem statement for your project could focus on the need to address inefficiencies in commercial electricity consumption in Indian states. By utilizing data analytics with Power BI, the project aims to identify areas where energy usage can be optimized and where there may be excessive consumption. The goal is to provide insights that can guide policymakers and businesses in making informed decisions to enhance energy efficiency and sustainability.

1.2 Proposed Solution

The proposed solution for your project involves leveraging data analytics with Power BI to analyze electricity consumption patterns in Indian states. By using this approach, you can identify trends, correlations, and factors influencing energy usage. The insights gained from the analysis can help in developing strategies for more efficient energy management and promoting

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sustainability in commercial electricity consumption across different regions.

1.3 Feature

Advanced Analytics: With Power BI's advanced analytics features, users can perform complex calculations, trend analysis, forecasting, and correlation analysis to uncover insights into factors influencing electricity consumption in different Indian states.

Data Integration: Power BI can seamlessly integrate data from multiple sources, including CSV files, Excel spreadsheets, databases, and cloud services, providing a comprehensive view of electricity consumption data from various sources.

Customization and Interactivity: Users can customize Power BI dashboards and reports according to their specific requirements, add filters, drill-down capabilities, and interactive elements for enhanced data exploration and analysis.

1.4 Advantages

Policy Formulation: Understanding consumption patterns helps policymakers formulate targeted energy policies and regulations to promote sustainable energy practices, reduce waste, and address regional disparities.

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Demand Forecasting: Analysis of historical consumption data aids in accurate demand forecasting, enabling utilities to plan and optimize energy generation, transmission, and distribution efficiently.

Socioeconomic Development: Reliable electricity supply is crucial for socioeconomic development. Analyzing consumption helps ensure equitable access to electricity, support economic growth, and improve living standards in underserved regions.

1.5 Scope

The scope of this project involves analyzing electricity usage patterns in different Indian states to identify factors influencing energy consumption. By leveraging Power BI, we aim to develop strategies for efficient energy management and sustainability in commercial electricity consumption. The project will focus on data analytics to gain insights that can drive informed decision-making and promote energy efficiency. Key metrics such as total consumption, per capita usage, and growth rates will be analyzed, and comparative studies among states will be conducted. The project scope also encompasses deriving actionable insights for policy formulation, infrastructure planning, demand-side management, and renewable energy integration.

CHAPTER 2

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SERVICES AND TOOLS REQUIRED

2.1 Services Used

- **Data Collection and Storage:** Services Data collection involves sourcing relevant data from various sources such as government reports, utility companies, and research organizations, ensuring data accuracy, consistency through data cleaning and preprocessing. The collected data is securely stored in suitable storage solutions such as databases or cloud storage services, ensuring scalability, accessibility, and data protection.

- **Data Processing Services**: Services like Azure Stream Analytics or AWS Kinesis Data Analytics can be used to process the real-time data.

- Machine Learning Services: Azure Machine Learning or AWS Sage Maker can be used to build predictive models based on historical data.

2.2 Tools and Software used

Tools:

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- Power BI: The main tool for this project is Power BI, which will be used to create interactive dashboards for real-time data visualization.

- **Power Query**: This is a data connection technology that enables you to discover, connect, combine, and refine data across a wide variety of sources.

Software Requirements:

- **Power BI Desktop**: This is a Windows application that you can use to create reports and publish them to Power BI.

- **Power BI Service**: This is an online SaaS (Software as a Service) service that you use to publish reports, create new dashboards, and share insights.

- **Power BI Mobile**: This is a mobile application that you can use to access your reports and dashboards on the go.

CHAPTER 3

PROJECT ARCHITECTURE

3.1 Architecture

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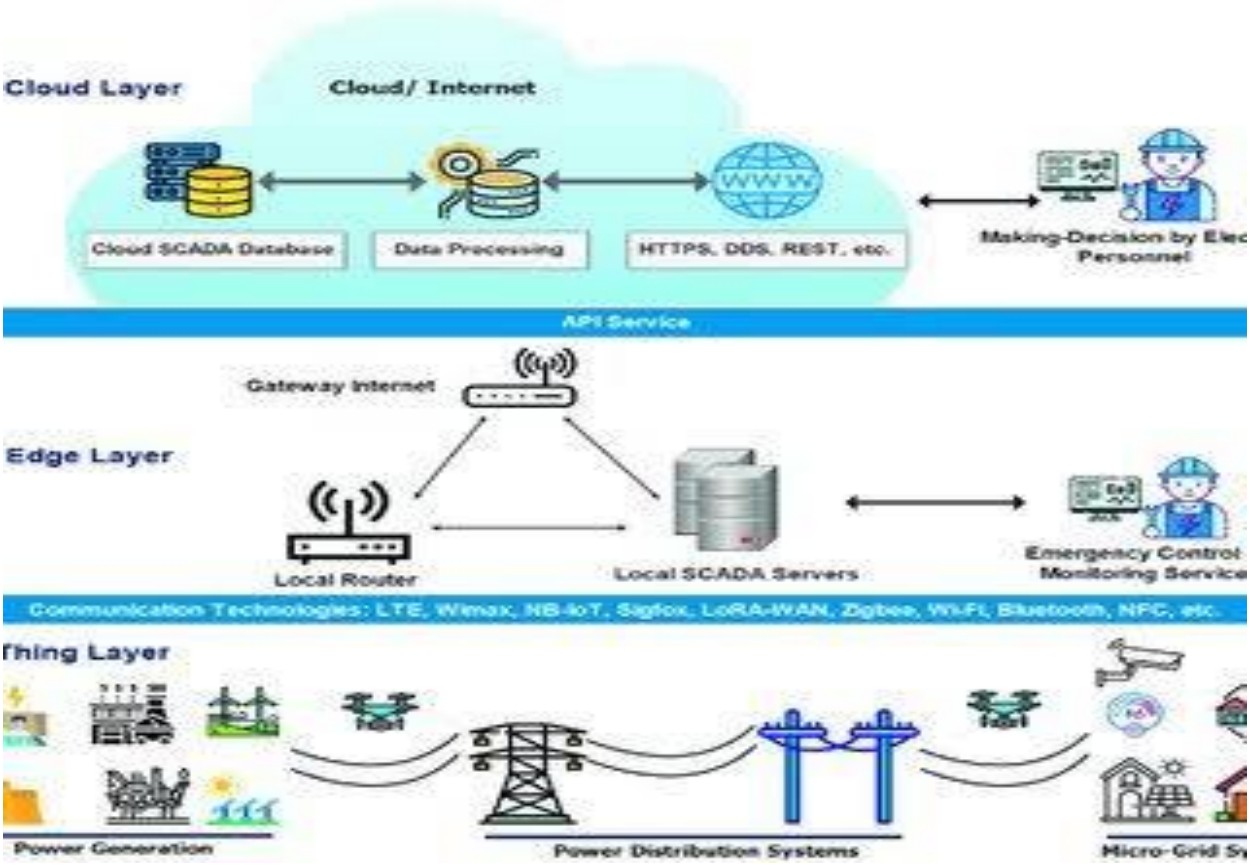

Here's a high-level architecture for the project:

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1. Data Collection: Gather data on commercial electricity consumption in various Indian states.

2. Data Processing: Clean and preprocess the data to ensure accuracy and consistency.

3. Data Analysis: Utilize Power BI to analyze the processed data and identify patterns and trends**.**

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4. **Visualization**: Create interactive visualizations to present the analyzed data in a user-friendly format.

5. **Insights Generation**: Derive insights from the visualizations to inform strategies for efficient energy management and sustainability.

6. **Strategy Development:** Develop strategies based on the insights to optimize commercial electricity consumption in Indian states.

This high-level architecture outlines the key components and layers involved in the project, from data collection and storage to analysis, visualization, and presentation of insights using Power BI, all within a scalable and secure cloud infrastructure.

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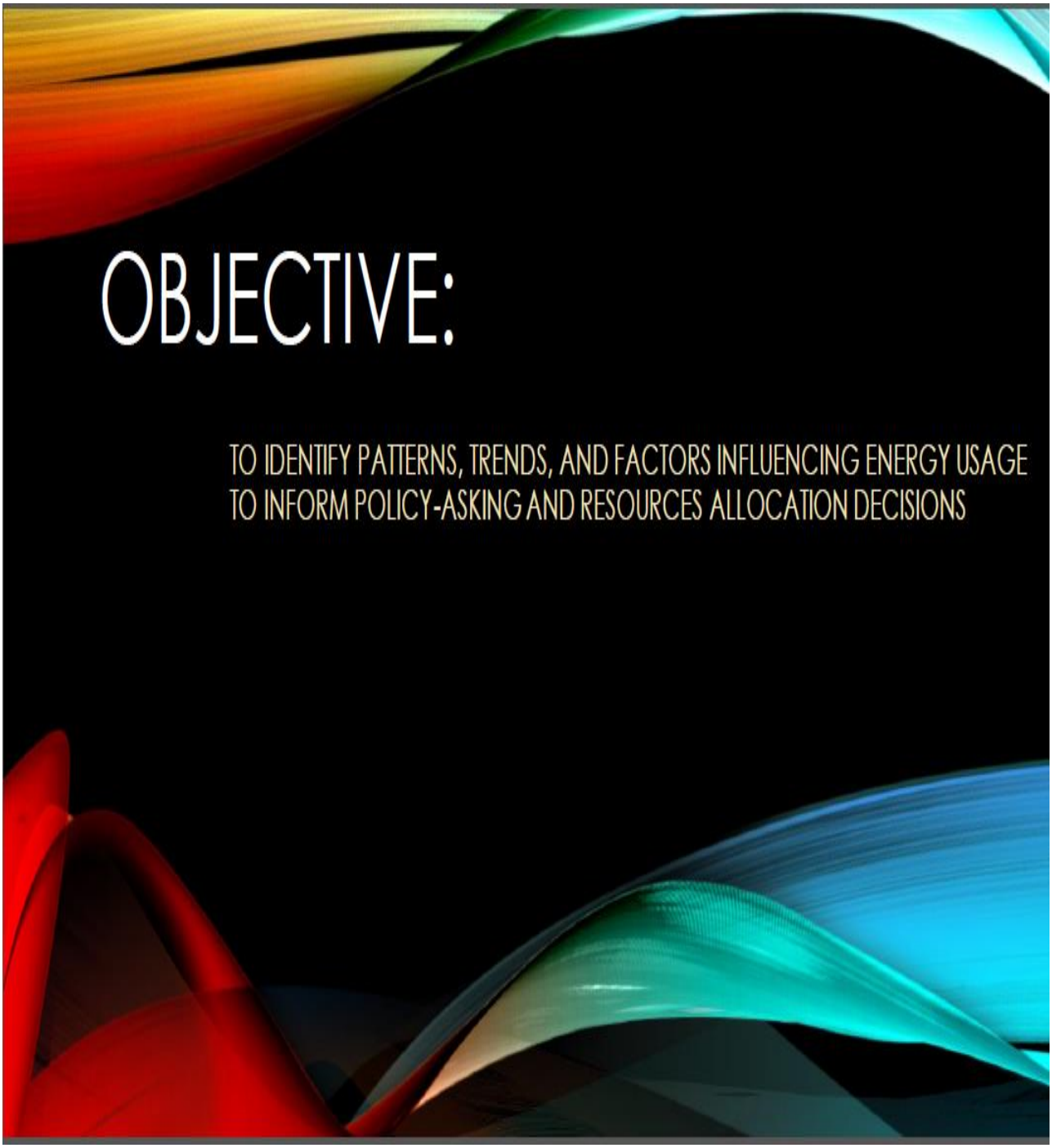
CHAPTER 4

DASHBOARD



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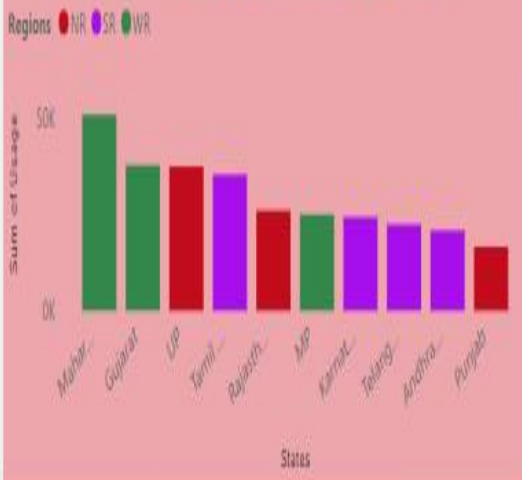
Analysis of Commercial Electricity Consumption in Indian States

Regions

All

02-01-2019 03-05-2019

Top 10 Power Consuming States from all the regions

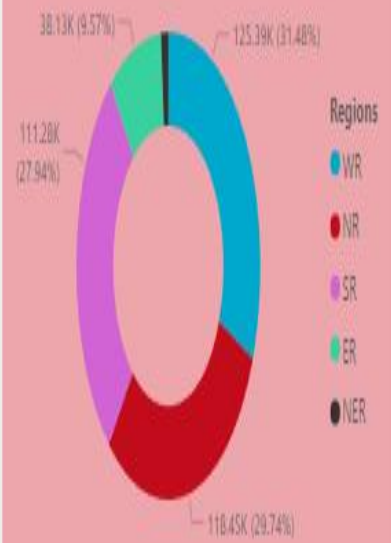


Distribution of Power consumption usage by Regions, Latitude and longitude

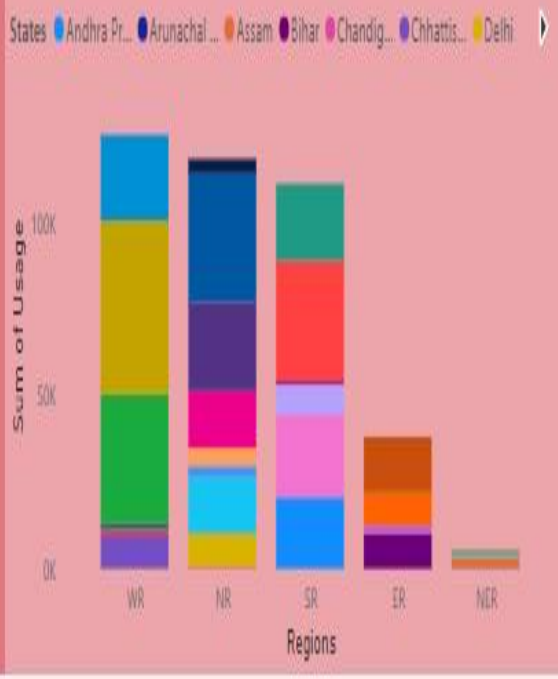
States

- Select all
- Andhra Pradesh
- Arunachal Pradesh
- Assam
- Bihar
- Chandigarh
- Chhattisgarh
- Delhi
- DNH
- Goa
- Gujarat
- Haryana
- HP
- J&K
- Jharkhand
- Karnataka
- Kerala
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- MP

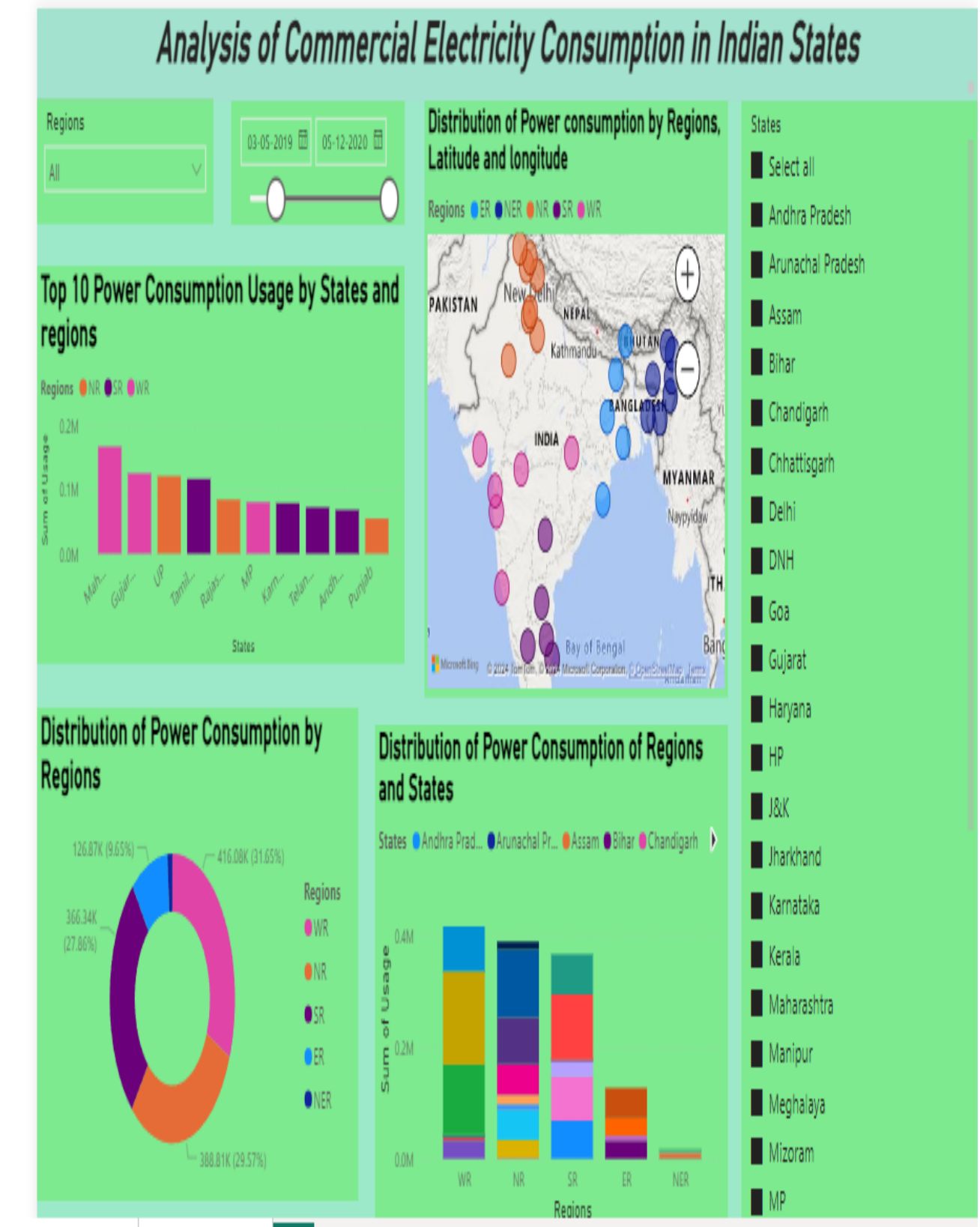
Distribution of Power Consumption by regions



Sum of Usage by Regions and States



Before Lockdown | After Lockdown | +



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CONCLUSION

The conclusion of this project would involve summarizing the key findings and insights gathered from the analysis of commercial electricity consumption in Indian states. By leveraging Power BI for data analytics, the project aims to provide valuable information for decision-making and implementing strategies to enhance energy efficiency and sustainability in the commercial sector. The insights gained can help stakeholders make informed choices to optimize energy consumption and promote a more sustainable future.

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FUTURE SCOPE

The future scope of this project could involve expanding the analysis to include more granular data on electricity consumption, such as specific industries or time periods. Additionally, incorporating predictive analytics to forecast future energy trends and implementing real-time monitoring systems for better energy management could be valuable enhancements

Implementing predictive models to forecast electricity consumption trends, anticipate future demand, and optimize resource allocation and energy generation planning

Incorporating machine learning algorithms to identify patterns, anomalies, and predictive indicators within electricity consumption data, enabling proactive decision-making and anomaly detection.

Developing strategies and initiatives based on analysis findings to promote energy efficiency, reduce wastage, and encourage adoption of energy-efficient technologies and practices.

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REFERENCES

https://youtu.be/ZgzGqoq3Xuc?si=ClRHlJTMjVwfV3VT

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LINK

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