Final Project Report

Plugging into the Future: An Exploration of Electricity Consumption Patterns using Tableau

1. Introduction

This project analyzes electricity consumption trends across Indian states and regions. The objective is to explore usage patterns over time and generate actionable insights through interactive dashboards and visual analytics.

2. Problem Statement

Understanding electricity consumption patterns is critical for planning infrastructure, policy decisions, and efficient energy distribution. This project visualizes historical data to reveal trends, regional differences, and behavioral shifts.

3. Dataset Overview

The dataset includes time-series electricity consumption data for Indian states covering 2019–2020. Fields include state, region, coordinates, dates, and usage values measured in Mega Units.

4. Methodology

The workflow includes data collection, cleaning, preparation, visualization design, dashboard creation, and performance testing. Analytical storytelling is used to present findings clearly.

5. Visualizations Developed

1. 2019 State Consumption
2. 2020 State Consumption
3. Total Consumption
4. Usage by Region
5. Top N and Bottom N States
6. 2019 & 2020 Month-wise Consumption
7. Total Consumption Region-wise
8. Usage Before and After Lockdown
9. Region-wise State Usage
10. Quarter Usage
11. Metro City State Usage

12 Usage by Year

6. Dashboard and Story

Interactive dashboards summarize electricity trends, enabling comparisons across states, regions, and time periods. Storyboards guide users through key analytical insights.

7. Performance Testing

Performance evaluation ensures efficient rendering of data, optimal filter usage, and accurate calculations for smooth dashboard interaction.

8. Results

The analysis reveals regional consumption variations, seasonal patterns, and the measurable impact of lockdown periods on electricity demand.

9. Advantages

• Easy interpretation of large datasets
• Visual identification of trends
• Supports data-driven decision making

10. Limitations

• Dependent on dataset accuracy
• Historical scope limited to available data

11. Conclusion

The project successfully demonstrates how visualization tools can transform raw electricity data into meaningful insights for planning and optimization.

12. Future Scope

Future work may include predictive analytics, real-time monitoring integration, and AI-driven forecasting.

13. Appendix

Includes dataset references, dashboard links, and implementation notes.

14.Source code

```
from flask import Flask, render_template
app= Flask(__name__)
```

```
@app.route('/')
def home():
    return render_template("index.html")
if __name__=='__main__':
    app.run(debug=True)
```