

# FINAL REPORT

## Power Insights: Electricity Consumption Visualization

### (2019–2020)INTRODUCTION

#### 1.1 Project Overview

This project aims to explore and visualize electricity consumption patterns across different states and regions in India for the years 2019 and 2020. Using data sourced from credible datasets and prepared with Excel, we built an interactive dashboard in Tableau Public to help stakeholders gain quick, actionable insights into electricity usage trends.

#### 1.2 Purpose

The purpose of this project is to provide the different type of visualizations of Electricity Consumption in India in the year (2019-2020). By Transforming the raw data into meaningful insights.

### 1. IDEATION PHASE

The ideation phase focused on understanding the core challenges and conceptualizing a usercentric solution for visualizing electricity consumption.

#### 2.1 Problem Statement

Users often face difficulties accessing and interpreting large datasets for electricity consumption across years and states.

#### 2.2 Empathy Map Canvas

The empathy map helped understand customers:

- Think & Feel: Users want quick, accessible data insights.
- See & Hear: Users are exposed to scattered data without clear visual summaries.
- Pain: Time-consuming manual data analysis.
- Gain: A clean, interactive dashboard simplifies data exploration.

#### 2.3 Brainstorming

The team brainstormed multiple ideas to present the data in a clear, visual, and interactive manner. Potential approaches included:

- Region-wise and state-wise consumption comparisons.
- Interactive filters for year, region, and state selection.
- Multiple visual elements like bar graphs and geographic maps.

## 2. REQUIREMENT ANALYSIS

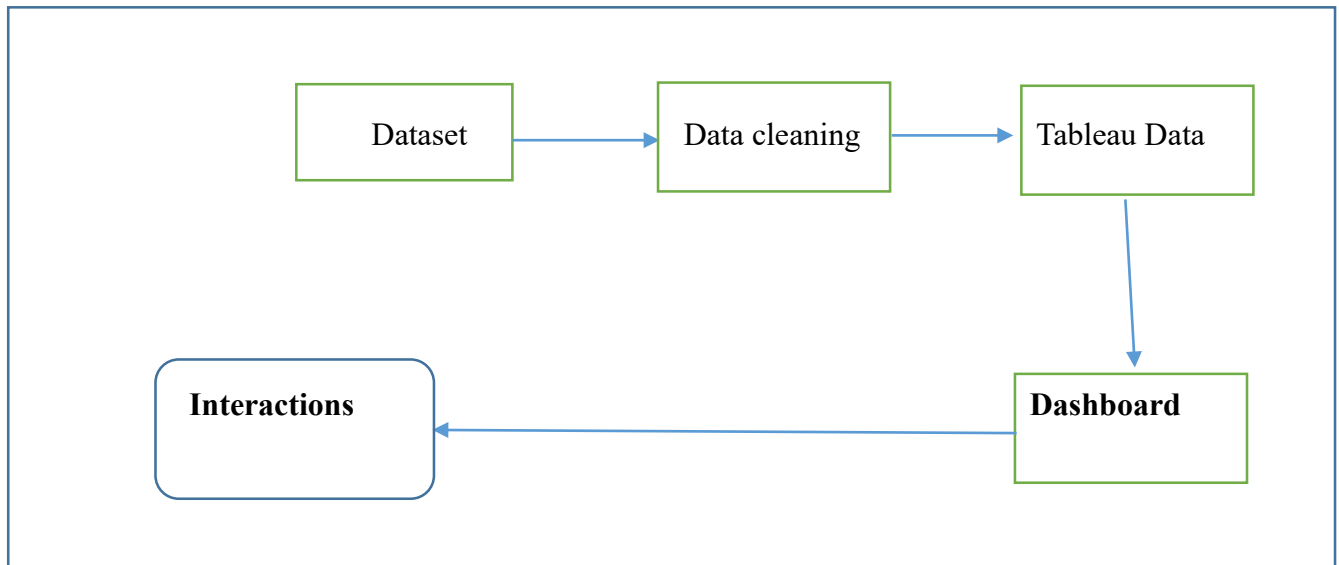
### 3.1 Customer Journey Map

Stage	Action	Tool	Emotion	Opportunity
Discover	User becomes aware of the dashboard through presentations or links	Shared Link, Tableau Public	Curious	Capture attention with intuitive visuals
Explore	User explores filters and visualizations	Filters (Year, Region, State)	Engaged	Provide smooth interactions and clear options
Learn	User identifies trends in electricity usage	Interactive Charts, Maps	Surprised	Highlight key insights and comparisons
Share	User shares findings or dashboard link	Share/Export Options	Proud	Expand reach and encourage collaborative use

### 3.2 Solution Requirement

- Visualize electricity consumption across different states and regions for 2019 and 2020.
- Develop an interactive dashboard with filters for year, region, and state selection.
- Present data using clear and informative charts and maps.
- Host the dashboard on Tableau Public for easy access and sharing.
- Ensure the dashboard is responsive, quick to load, and user-friendly.
- Maintain data accuracy with cleaned and properly formatted data.
- Provide options for sharing the dashboard or exporting views.

### 3.3 Data Flow Diagram



### 3.4 Technology Stack

- **Frontend:** Tableau Public,python
- **Backend:** flask(data-based project) .
- **Preprocessing Tool:** Excel / Google Sheets
- **Data Source:** [Dataset Link](#)

## 3. PROJECT DESIGN

### 4.1 Problem-Solution Fit

**Problem:** Users struggle to interpret large electricity datasets without a clear, interactive tool.

**Solution:** An interactive dashboard enables easy exploration of state-wise consumption and trends across 2019 and 2020.

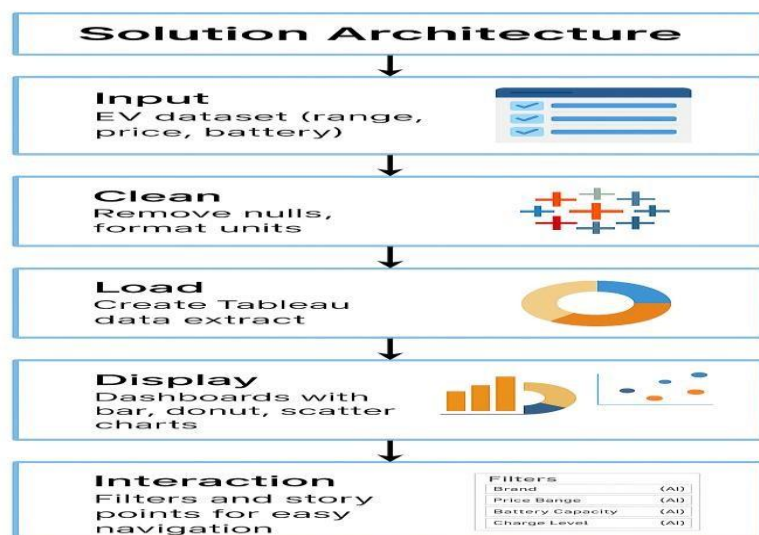
### 4.2 Proposed Solution

An interactive dashboard where users can:

- Filters for year, region, and state for customized analysis.
- View charts and KPIs
- Explore usage region wide visually

### 4.3 Solution Architecture

1. Input: EV dataset (range, price, battery, brand)
2. Clean: Remove nulls, format units
3. Load: Create Tableau data extract
4. Display: Dashboards with bar, donut, scatter charts
5. Interaction: Filters and story points for easy navigation



## 4. PROJECT PLANNING & SCHEDULING

### 5.1 Project Planning

- Collected data, removed nulls, formatted fields
- Created charts, designed dashboard layout
- Finalized KPIs, added filters, published dashboards
- Performed testing, documentation, final edits

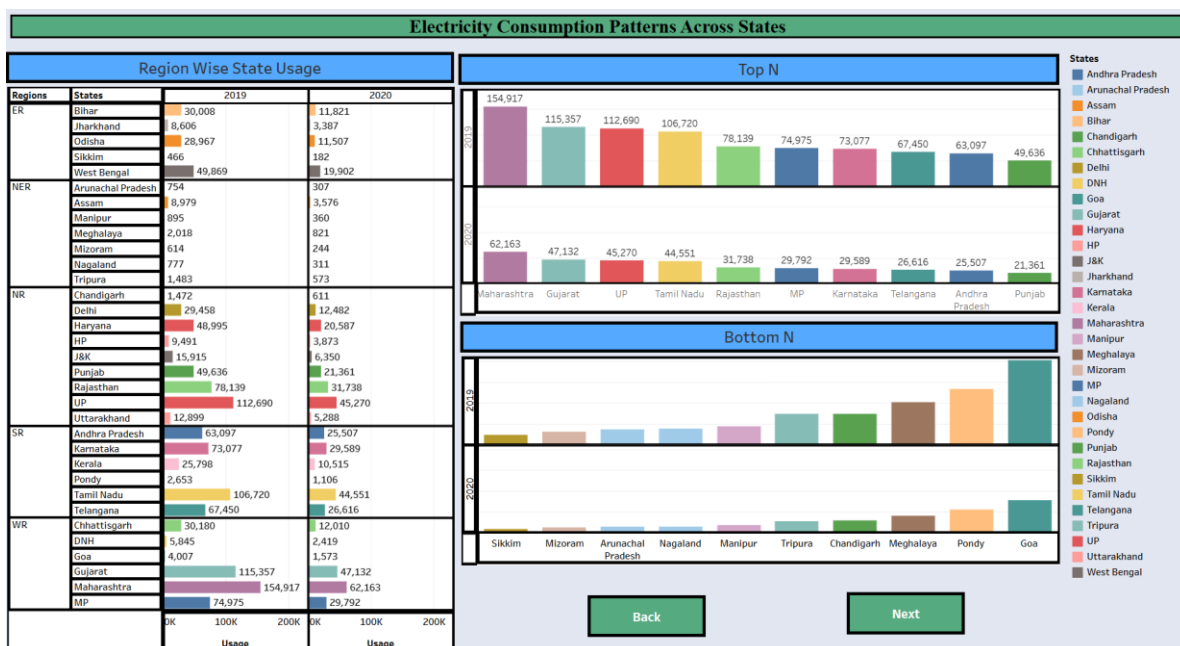
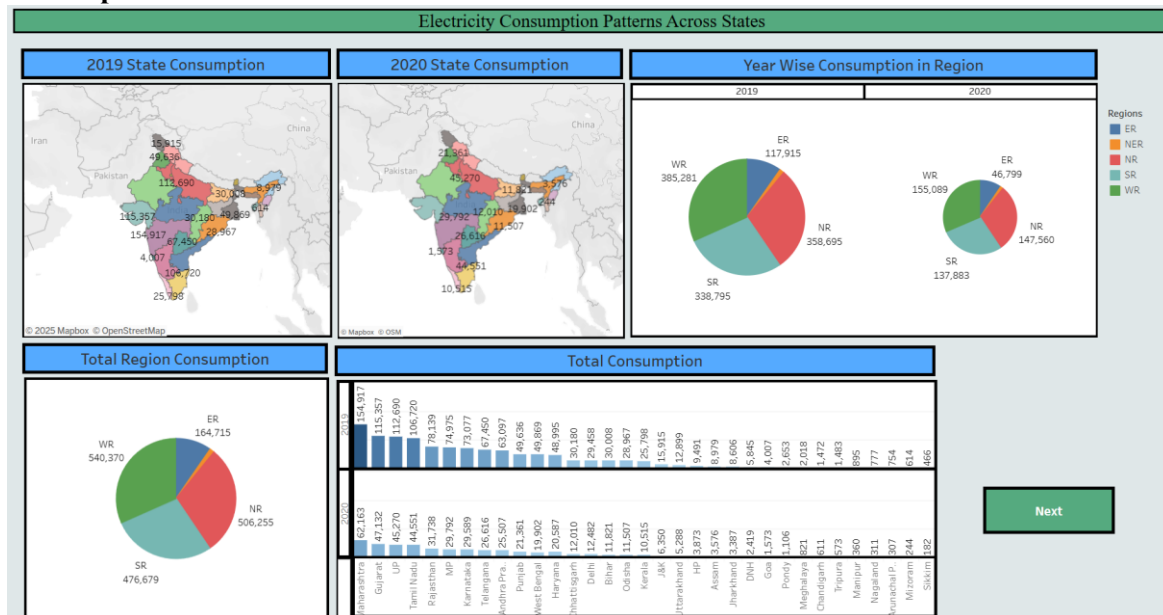
## 5. FUNCTIONAL AND PERFORMANCE TESTING

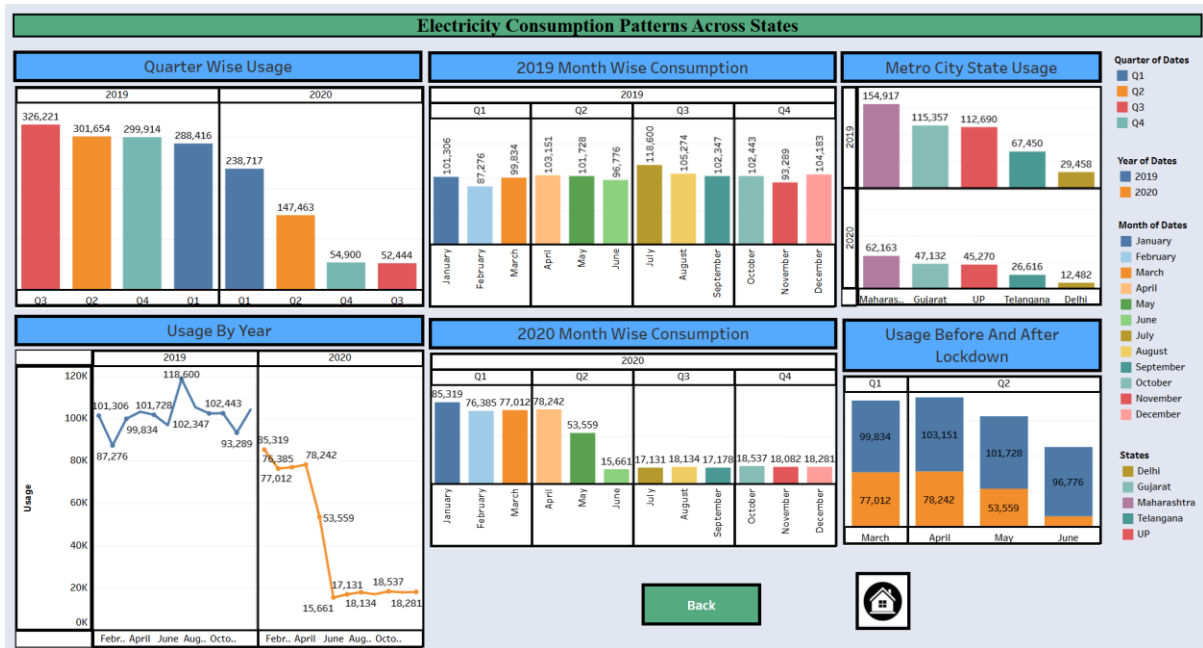
### 5.1 Performance Testing

We tested the dashboard on different devices and browsers. It loaded quickly and worked well. Filters and visuals responded smoothly, and no lag was noticed.

## 6. RESULTS

### 6.1 Output Screenshots





## 7. ADVANTAGES & DISADVANTAGES

### Advantages

- User-friendly and interactive
- Accessible via Tableau Public
- Easy comparison across India

### Disadvantages

- Limited to available dataset
- Tableau Public may have privacy limitations
- Not real-time data

## 8. CONCLUSION

This project successfully delivers an interactive and insightful dashboard to analyze electricity consumption for the years 2019 and 2020. By utilizing clean data, visual filters, and intuitive charts, it enables users to easily explore consumption trends across different states and regions. The dashboard empowers informed decision-making and lays a strong foundation for future enhancements like real-time data integration and predictive analytics.

## 9. FUTURE SCOPE

- Expand the dataset to cover additional years for a more comprehensive analysis.
- Integrate real-time electricity consumption data for live monitoring.
- Implement predictive models to forecast future consumption trends.
- Add granular data insights at district or city levels for deeper analysis.

## 10. Appendix: -

The whole implementation part was given in the [coding part](#) folder.

## 11. Dataset Link: -

[Dataset Link](#)

## GitHub & Project Demo Link:

<https://github.com/sowmyasri-ganapavarapu/Plugging-into-the-Future-An-Exploration-of-Electricity-Consumption-Patterns-/blob/main/Project>

## Video Demo Link:

<https://drive.google.com/file/d/1aA0ydw94ojrU4vxPoECxOPThszG7Mcod/view?usp=sharing>