

5. Development Phase

Introduction

The development phase represents the practical implementation of the project. In this phase, I successfully performed data processing, analysis, visualization creation, and dashboard design using Tableau.

All steps were executed systematically to ensure accurate results and meaningful insights into electricity consumption patterns.

Step 1: Dataset Preparation

I collected the electricity consumption dataset in Excel format and carefully reviewed its structure. The dataset included:

- Month and Year
- Region Name
- Electricity Consumption Units
- Peak Usage
- Off-Peak Usage

Before importing into Tableau, I ensured the dataset was properly formatted and ready for analysis.

Step 2: Data Cleaning and Validation

I cleaned the dataset to maintain data accuracy and reliability.

The following improvements were made:

- Removed duplicate records
- Handled missing values appropriately
- Corrected spelling inconsistencies in region names
- Formatted date columns into proper date format
- Verified numerical values for accuracy

After cleaning, the dataset became consistent and ready for visualization.

Step 3: Data Import into Tableau

I imported the cleaned Excel dataset into Tableau successfully.

During this process:

- Verified data types (Date, Text, Numeric fields)
- Created calculated fields such as:
 - Year
 - Month
 - Total Consumption (if required)
- Checked relationships between fields

This ensured smooth analysis and accurate visualization results.

Step 4: Data Analysis Implementation

Using Tableau features, I performed detailed data analysis.

The following analyses were completed:

- Calculated total electricity consumption
- Compared electricity usage across different regions
- Analyzed monthly and yearly consumption trends
- Studied peak vs off-peak usage differences
- Applied filters for region and time-based comparison

This helped in identifying patterns and consumption behavior.

Step 5: Visualization Development

I created multiple interactive visualizations to represent insights clearly.

1. Monthly Trend Analysis (Line Chart)

This chart shows how electricity consumption changes month by month.

2. Regional Comparison (Bar Chart)

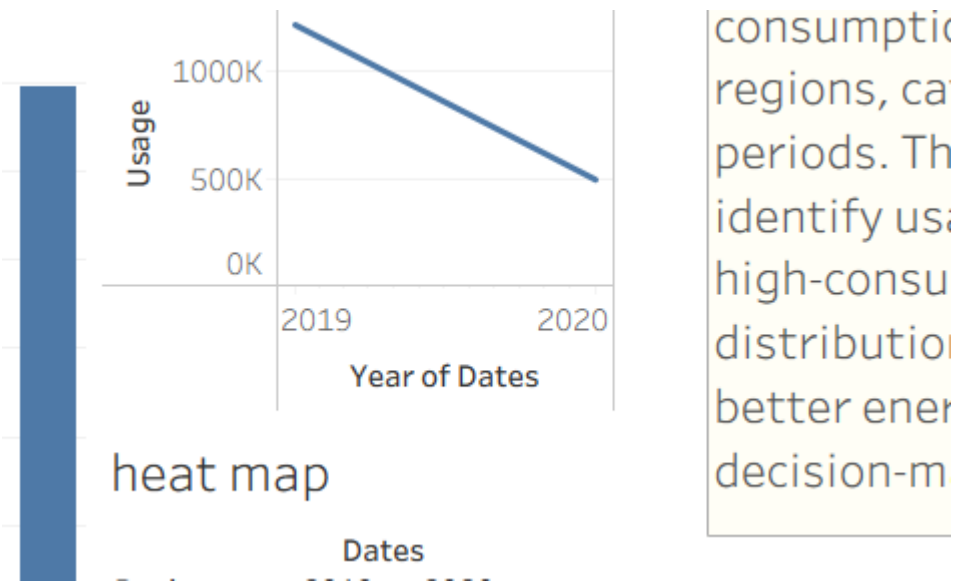
This visualization compares electricity consumption across regions.

3. Peak vs Off-Peak Usage (Pie Chart)

This chart highlights the percentage distribution of peak and off-peak electricity usage.

4. Heatmap Analysis

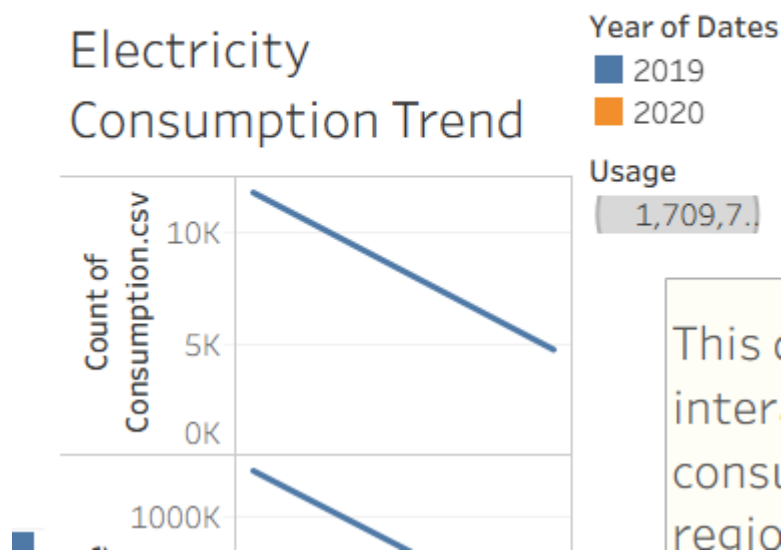
This heatmap shows electricity consumption intensity across regions and months.



5. Yearly Growth Trend

This visualization shows the overall growth or decline in electricity consumption over the years.

mption Analysis Dashboa..



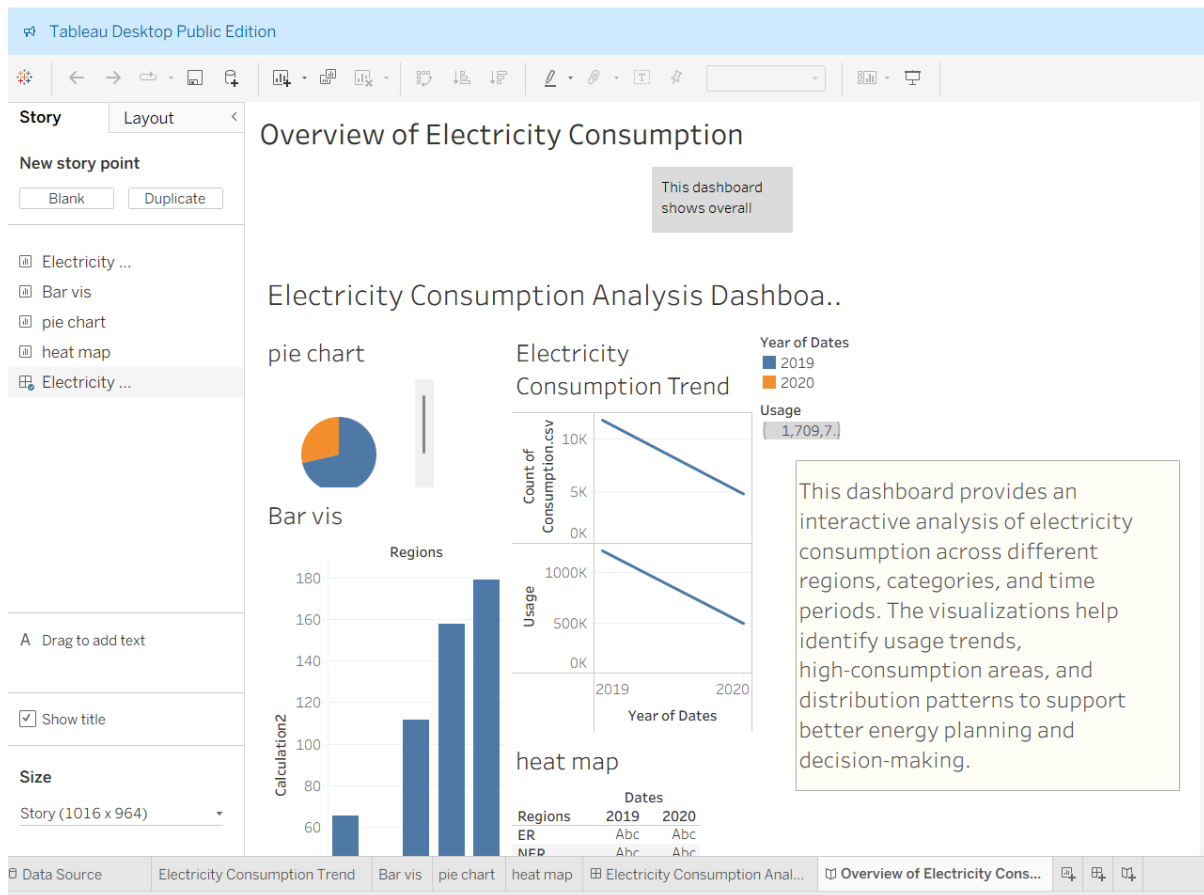
Step 6: Dashboard Design and Integration

After creating individual visualizations, I integrated them into a single interactive dashboard.

The dashboard includes:

- Monthly Trend Chart
- Regional Comparison
- Peak vs Off-Peak Analysis
- Heatmap
- Yearly Growth Chart
- Interactive Filters (Region, Year, Month)

The layout was designed to be clean, structured, and user-friendly.



Step 7: Testing and Validation

I tested the dashboard to ensure:

- Filters work properly
- Charts update dynamically
- Data accuracy is maintained
- Visual clarity is achieved

All functionalities were verified successfully.

Conclusion of Development Phase

The development phase was successfully completed using Tableau.

From data cleaning to dashboard integration, each step was carefully executed to ensure accuracy and clarity. The final dashboard effectively presents electricity consumption patterns and supports better decision-making for energy management.