Exploration of Electricity Consumption Patterns Using Tableau

1. Introduction

This guide demonstrates how to analyze electricity consumption patterns using Tableau. It includes dataset preparation, calculated fields, visualizations, and dashboard creation steps.

2. Sample Dataset Structure

```
Date, Region, Household_ID, Consumption_kWh, Temperature, Income_Level
2024-01-01, North, H001, 24, 5, Medium
2024-01-01, South, H002, 18, 15, High
```

3. Important Calculated Fields in Tableau

```
# Monthly Consumption
DATETRUNC('month', [Date])

# Average Consumption per Region
AVG([Consumption_kWh])

# Consumption Category
IF [Consumption_kWh] > 30 THEN "High"
ELSEIF [Consumption_kWh] > 15 THEN "Medium"
ELSE "Low"
END
```

4. Recommended Visualizations

• Line Chart: Monthly consumption trends over time.

• Bar Chart: Region-wise average consumption.

• Heat Map: Consumption vs Temperature.

• Pie Chart: Consumption category distribution.

5. Dashboard Design Steps

1. Combine all sheets into a dashboard. 2. Add filters for Region and Date. 3. Use interactive highlighting. 4. Add KPI indicators (Total Consumption, Avg Consumption, Peak Month).

6. SQL Query Example (Data Preparation)

```sql
SELECT
    DATE_TRUNC('month', date) AS month,
    region,
    AVG(consumption_kwh) AS avg_consumption
FROM electricity_data
GROUP BY month, region
ORDER BY month;
```