

# **PROJECT REPORT**

**ST.JOHN'S COLLEGE – PALAYAMKOTTAI**

**DEPARTMENT OF PHYSICS**

**Plugging Into The Future: An Exploration Of  
Electricity Consumption Patterns**

## **TEAM MEMBERS**

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**D JEYABALAN**

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**E PREM KUMAR**

# PLUGGING INTO THE FUTURE: AN EXPLORATION OF ELECTRICITY CONSUMPTION PATTERNS

## Introduction:

### Project Description:

India is the world's third-largest producer and third-largest consumer of electricity. In 2015-16, electric energy consumption in agriculture was recorded as being the highest (17.89%) worldwide. In light of the recent COVID-19 situation, when everyone has been under lockdown for the months of March to June the impacts of the lockdown on economic activities have been faced by every sector in a positive or a negative way. The dataset is exhaustive in its demonstration of energy consumption state wise. Analysing Electricity Consumption in India from Jan 2019 till 5th December 2020. This dataset contains a record of Electricity consumption in each states of India, here we are going to analyse State wise , Region wise and Overall Electricity consumption in India.

## OVERVIEW

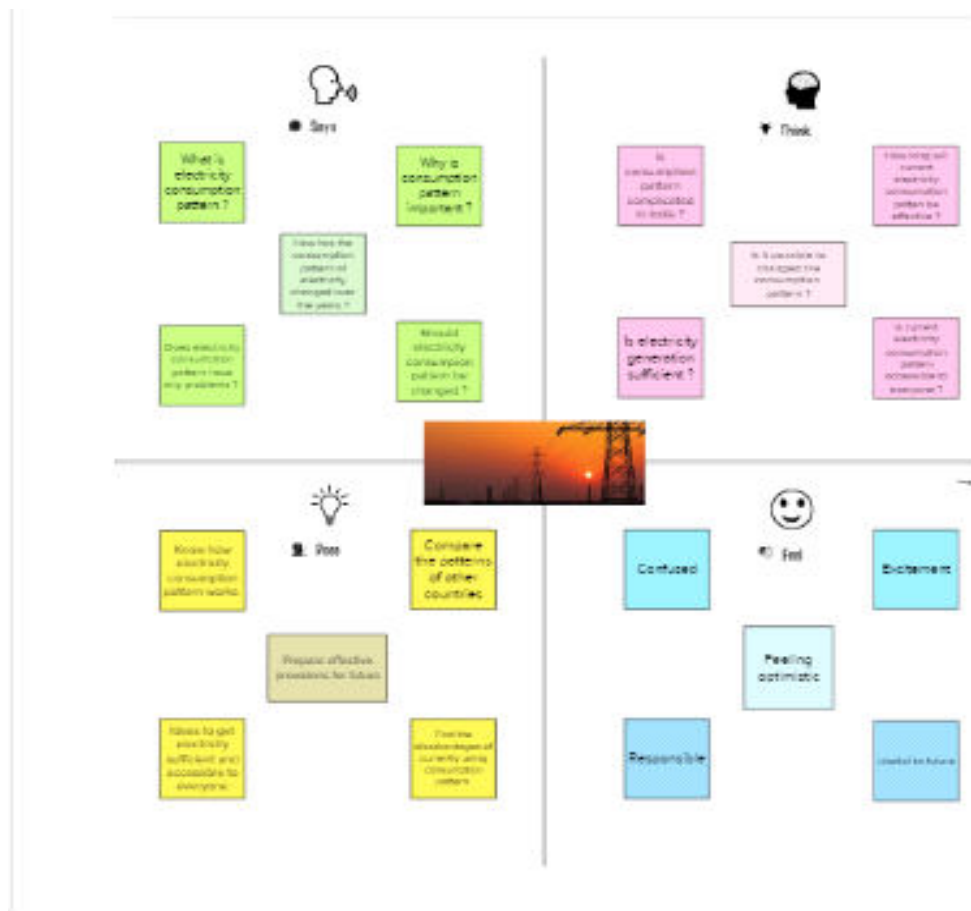
The national electric grid in India has an installed capacity of 370.106 GW as of 31 March 2020. Renewable power plants, which also include large hydroelectric plants, constitute 35.86% of India's total installed capacity. During the fiscal year (FY) 2019–20, the total electricity generation in the country was 1,598 TWh, of which 1,383.5 TWh generated by utilities. The gross electricity consumption per capita in FY2019 was 1,208 kWh.

## PURPOSE

Annual electricity consumption per capita serves as an important measure of a country's electric power development. Generally speaking, electricity consumption grows faster when the industrialization process develops quickly and goes down rapidly when industrialization is completed or near completion.

## Problem Definition & Design Thinking:

### EMPATHY MAP



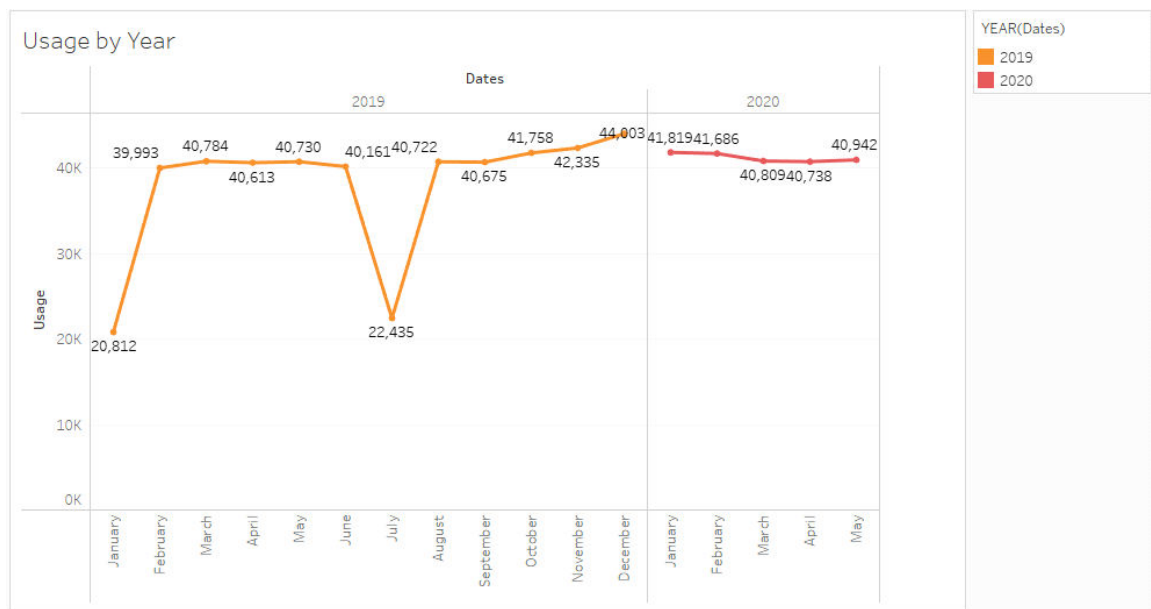
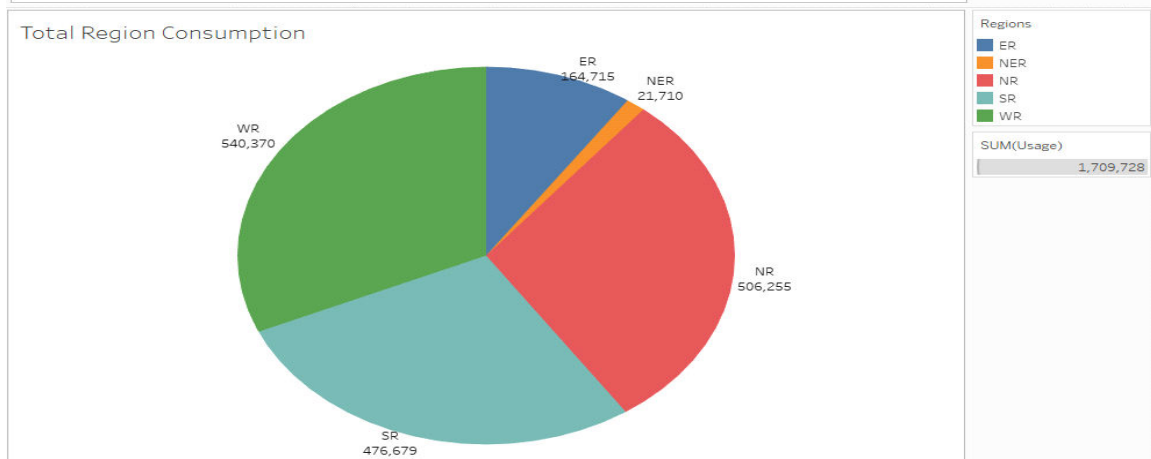
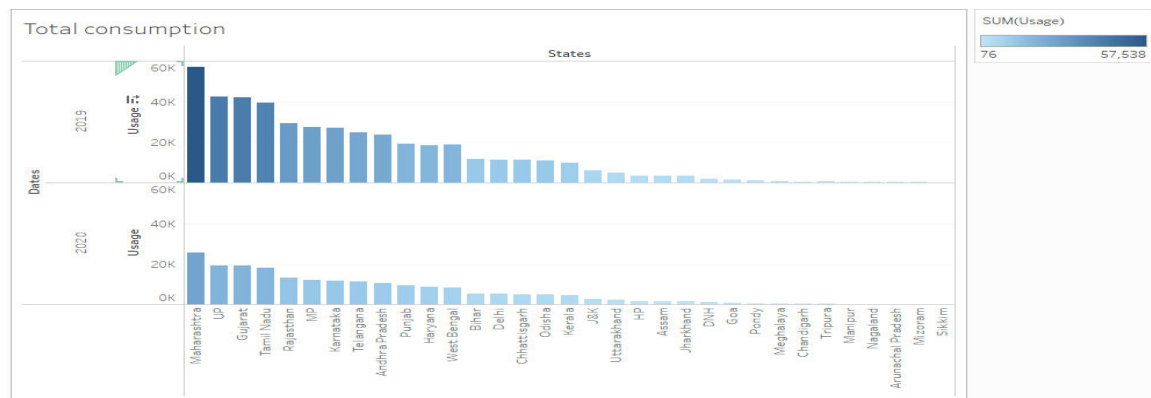
Ideation & Brainstorming Map:

BRAINSTORMING

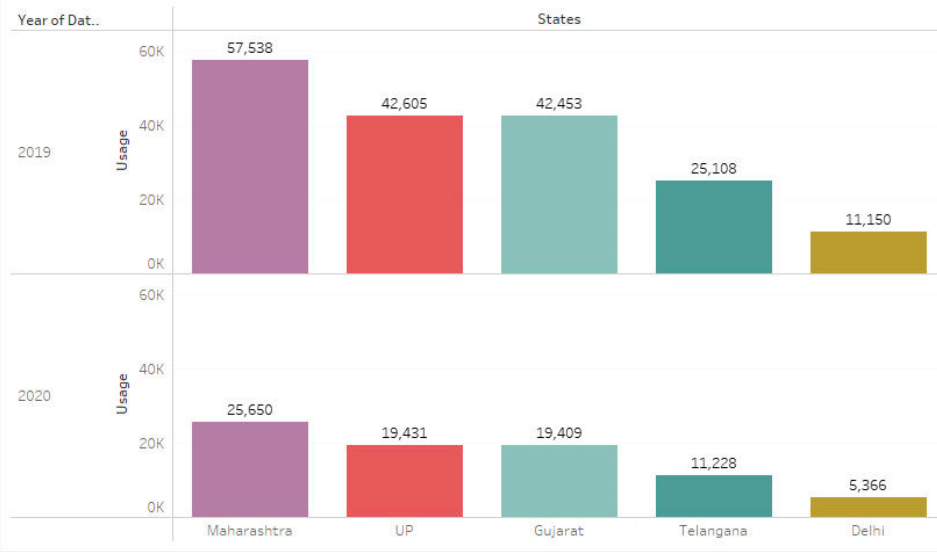
BRAINSTORMING : EXPLORATION OF ELECRICITY CONSUMPTION PATTERN



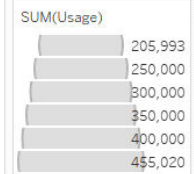
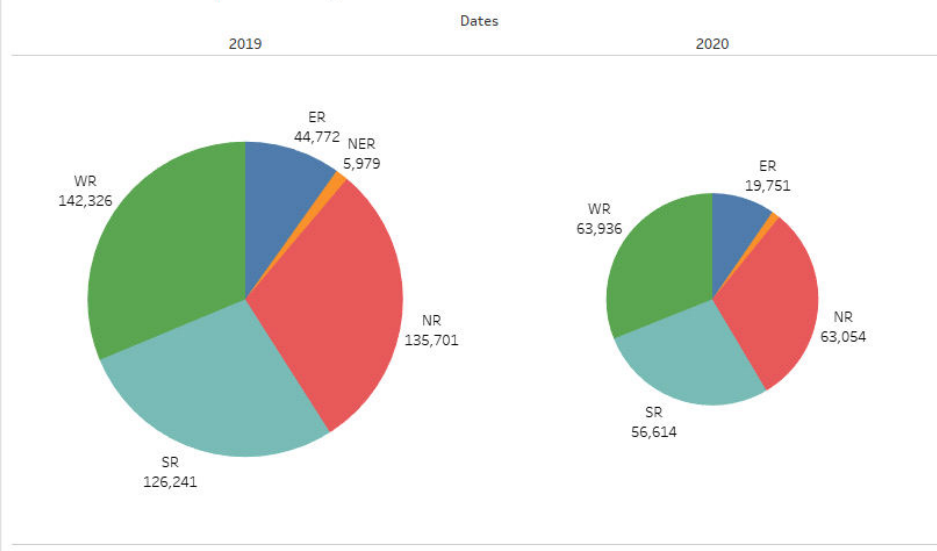
RESULT:



## Metro City State



## Year Wise Consumption in Region



Story 1

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YEARWISE CONSUMPTION IN REGION

METRO CITY STATE

USAGE BY YEAR

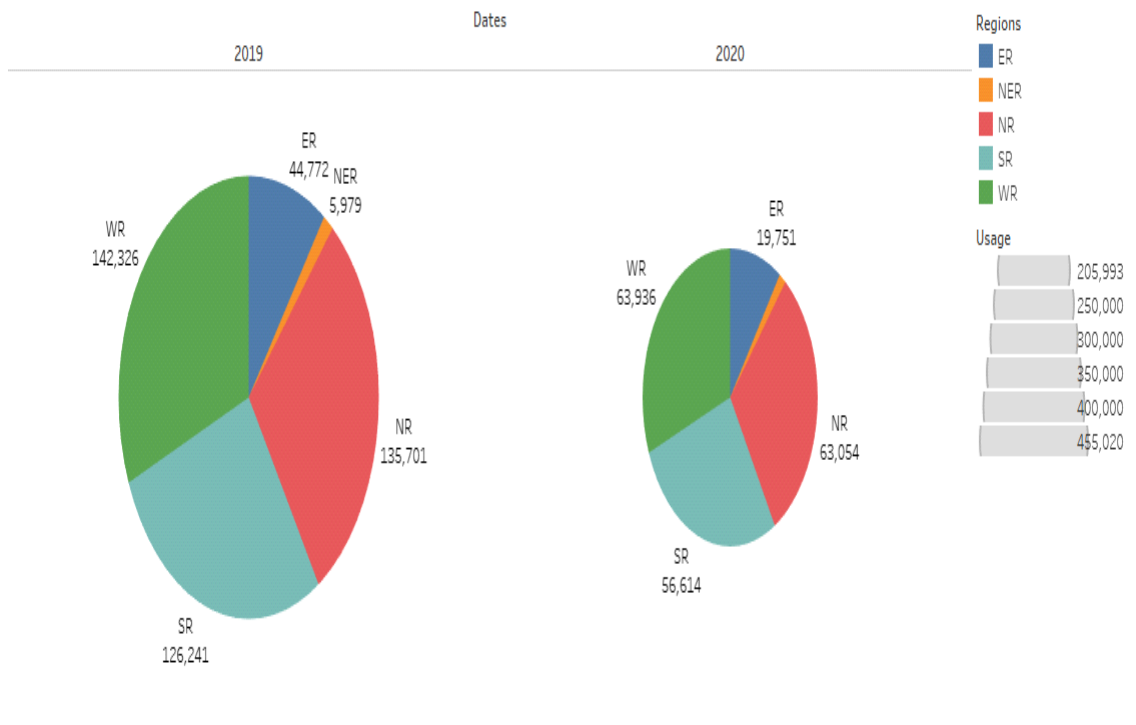
QUARTER WISE USAGE

REGION WISE STATE CONSUMPTION

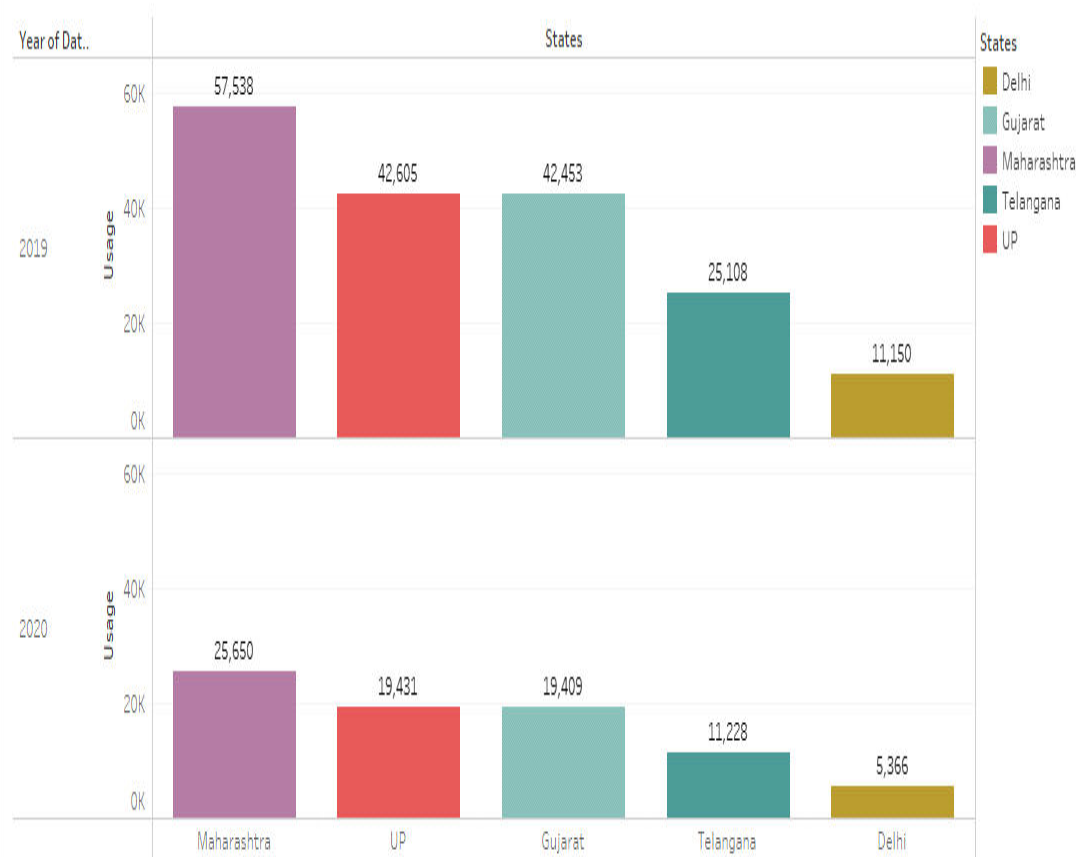
MONTH WISE TOP CONSUMPTION

USAGE BEFORE AND AFTER CONSUMPTION

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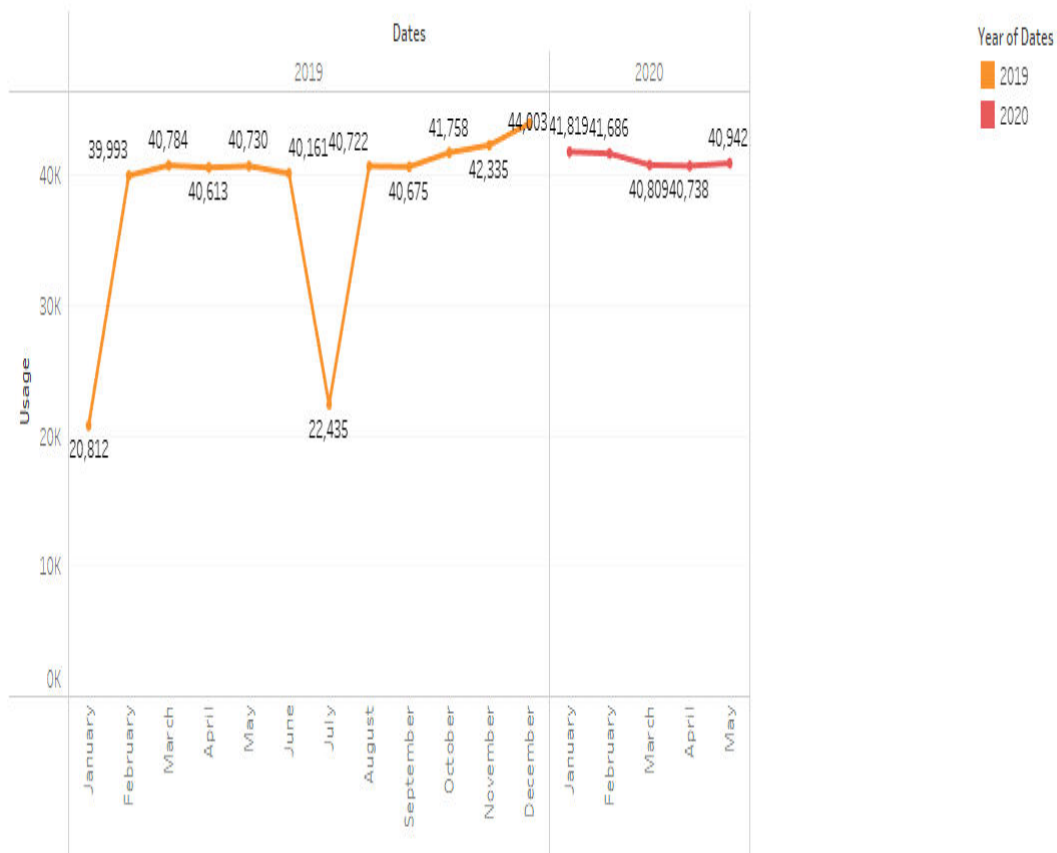
## Story 1





Story 1

YEARWISE CONSUMPTION IN REGION	METRO CITY STATE	USAGE BY YEAR	QUARTER WISE USAGE	REGION WISE STATE CONSUMPTION	MONTH WISE TOP CONSUMPTION	USAGE BEFORE AND AFTER CONSUMPTION
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Story 1

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YEARWISE  
CONSUMPTION IN  
REGION

METRO CITY STATE

USAGE BY YEAR

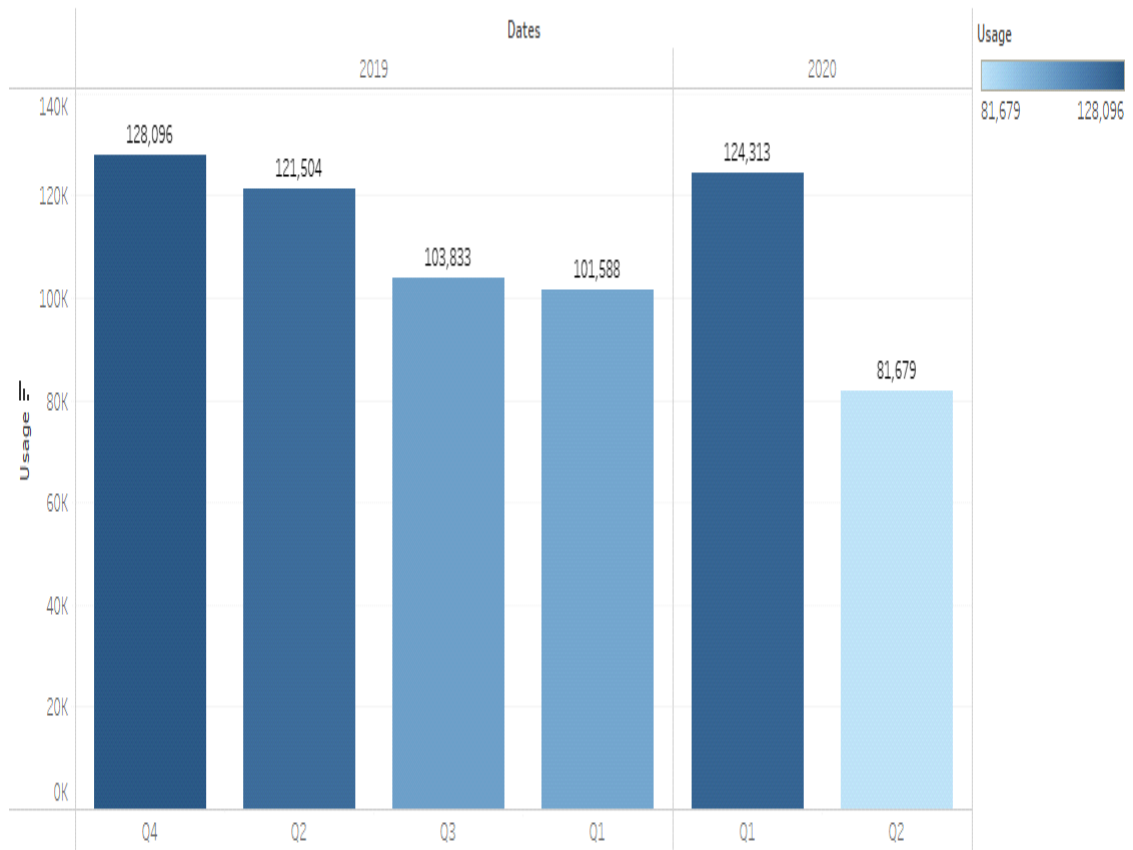
QUARTER WISE  
USAGE

REGION WISE STATE  
CONSUMPTION

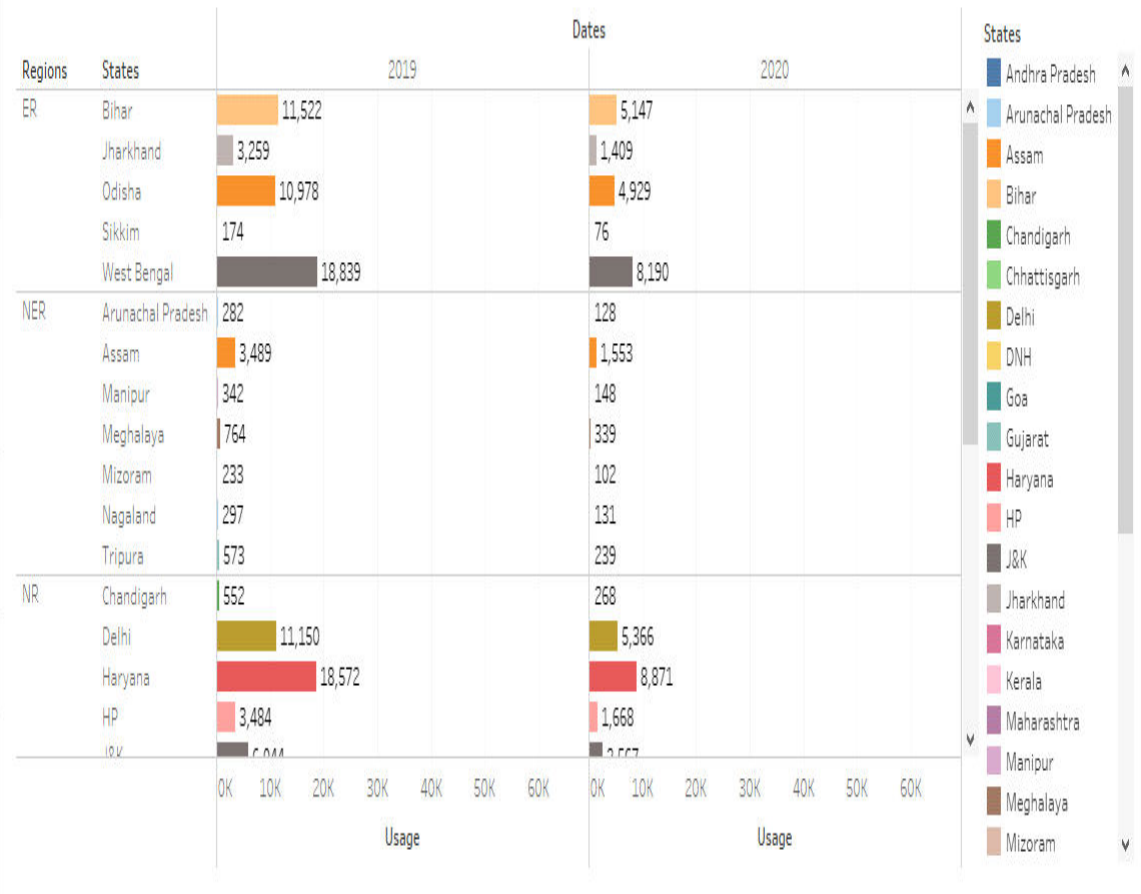
MONTH WISE TOP  
CONSUMPTION

USAGE BEFORE AND  
AFTER CONSUMPTION

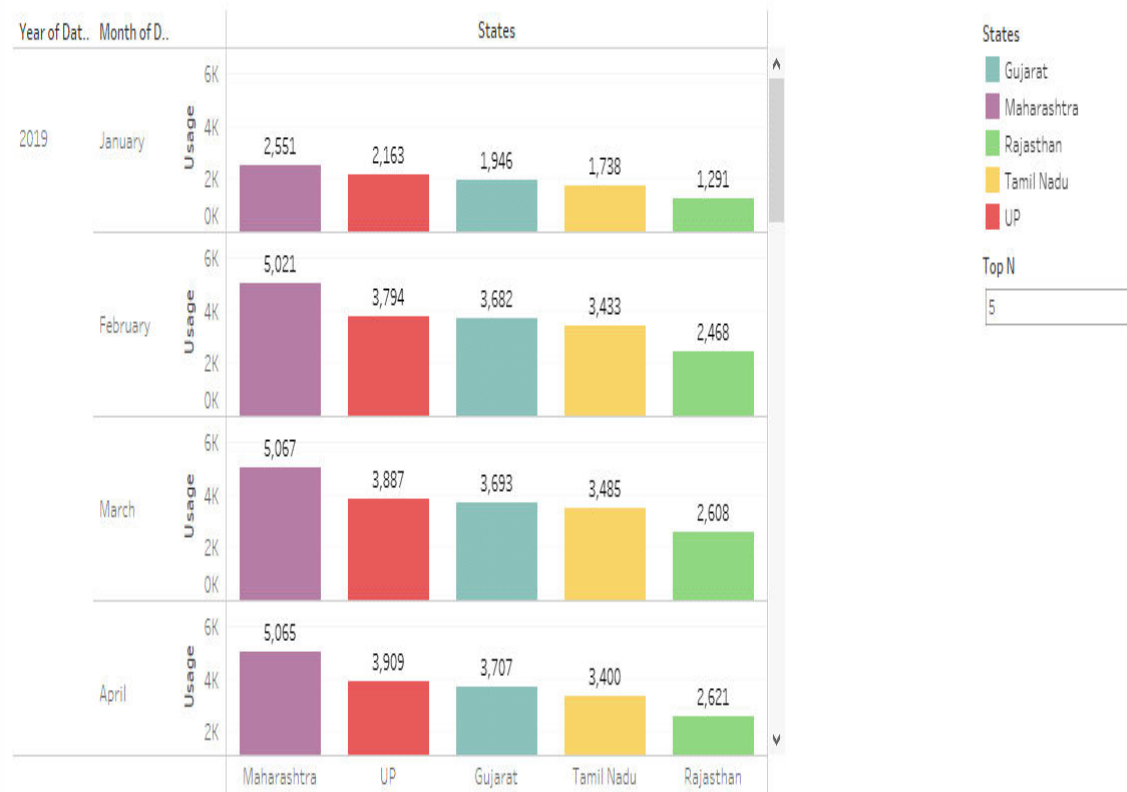
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# Story 1

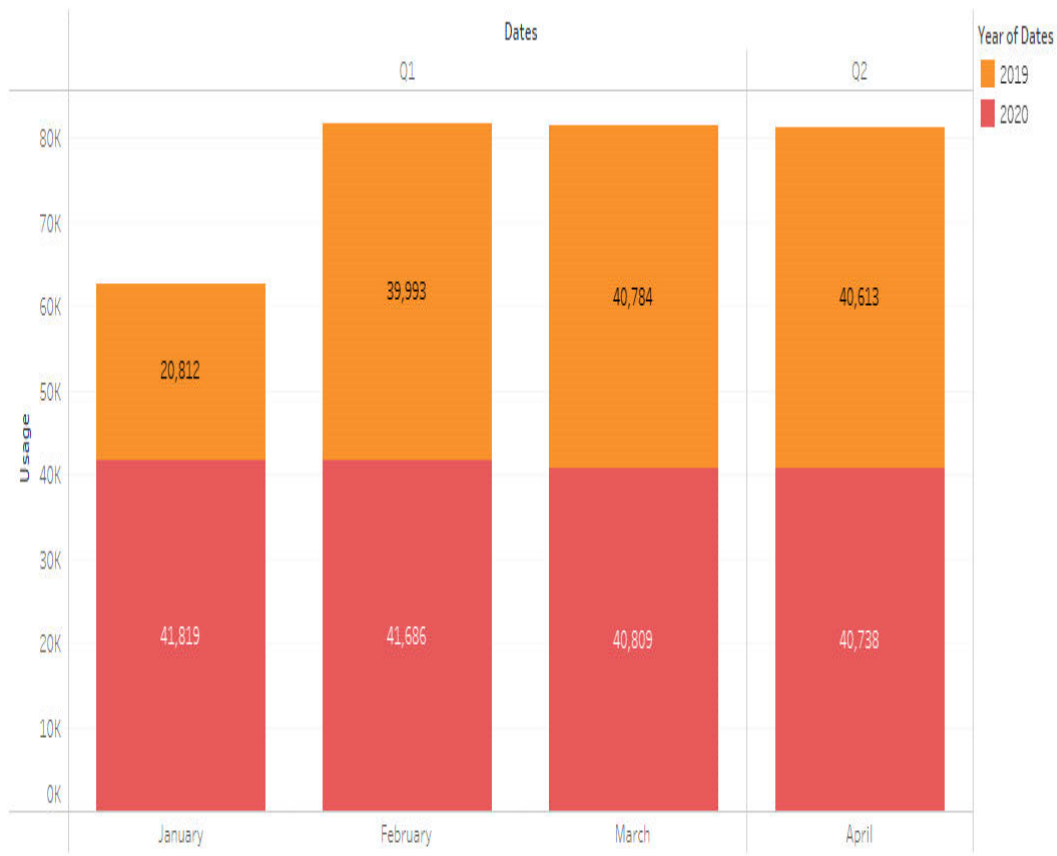


## Story 1



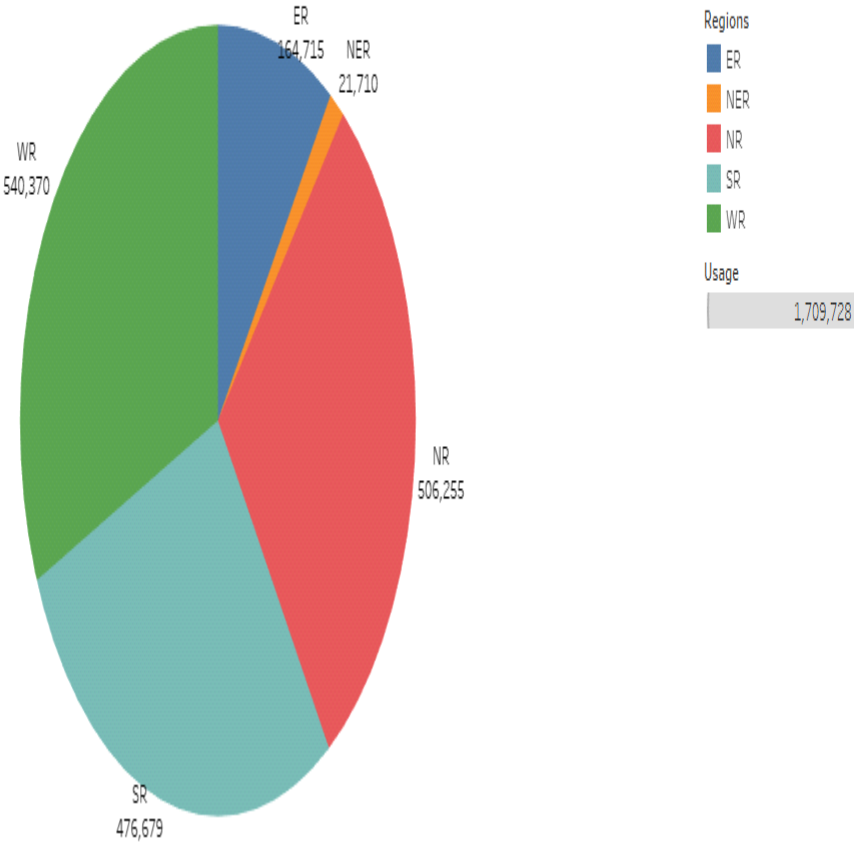
Story 1

<	REGION WISE STATE CONSUMPTION	MONTH WISE TOP CONSUMPTION	USAGE BEFORE AND AFTER CONSUMPTION	YEAR WISE CONSUMPTION IN REGION	2020 MONTHWISE CONSUMPTION	2019 MONTH WISE CONSUMPTION	BOTTOM N	>
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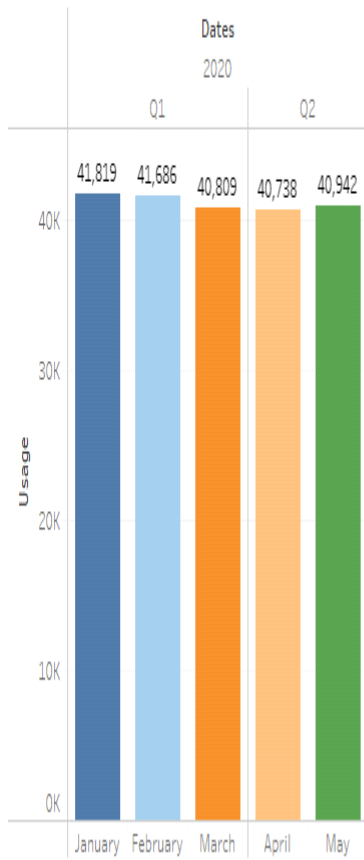
Story 1

<	STATE N	MONTH WISE TOP CONSUMPTION	USAGE BEFORE AND AFTER CONSUMPTION	YEAR WISE CONSUMPTION IN REGION	2020 MONTHWISE CONSUMPTION	2019 MONTH WISE CONSUMPTION	BOTTOM N	TOP N	>
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## Story 1

<	OP	USAGE BEFORE AND AFTER CONSUMPTION	YEAR WISE CONSUMPTION IN REGION	2020 MONTHWISE CONSUMPTION	2019 MONTH WISE CONSUMPTION	BOTTOM N	TOP N	TOTAL CONSUMPT	>
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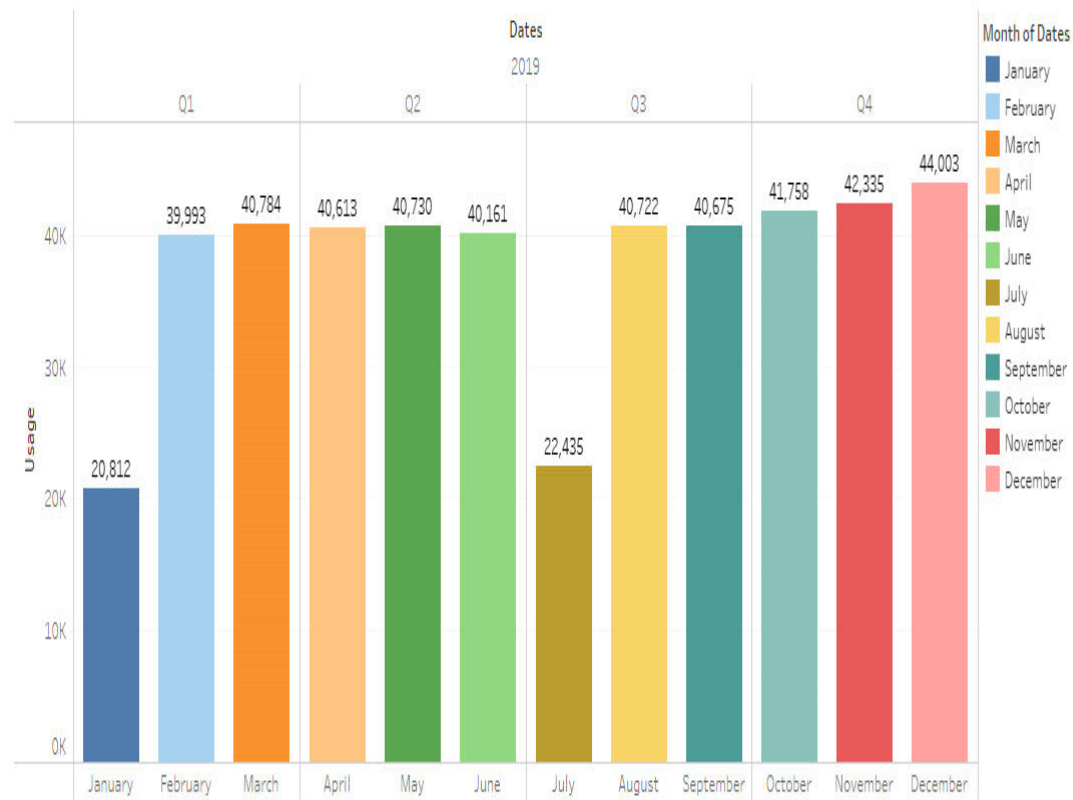


Month of Dates

- January
- February
- March
- April
- May

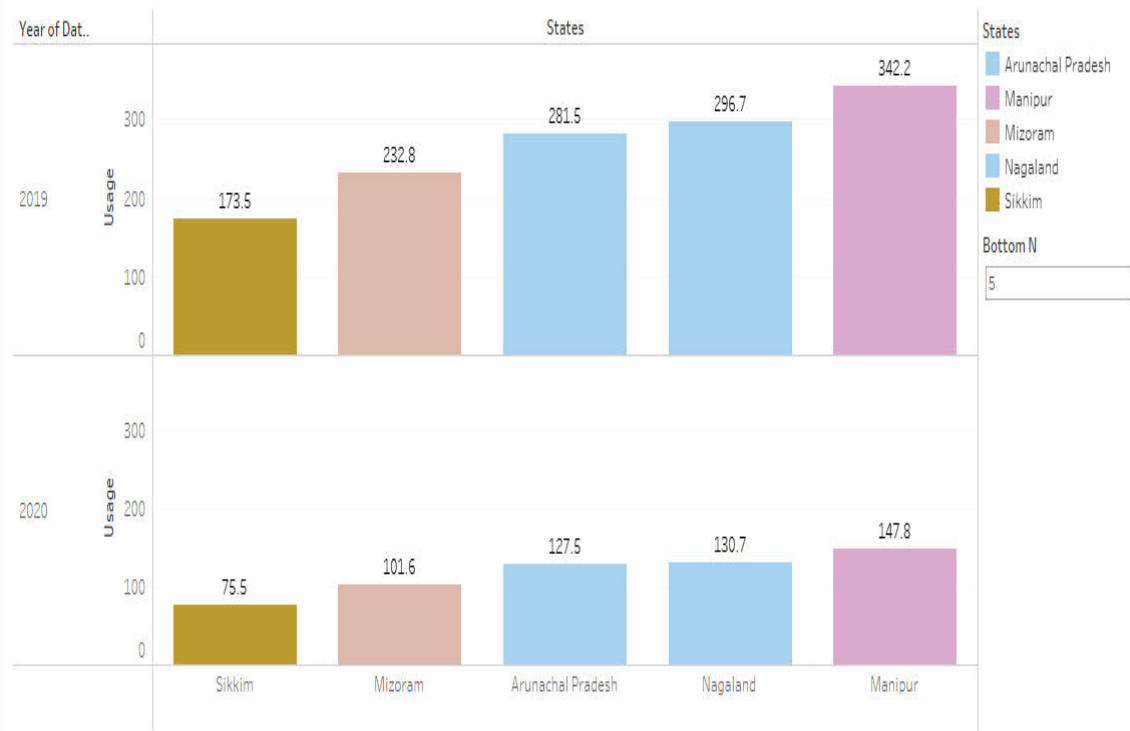
## Story 1

FORE AND NSUMPTION	YEAR WISE CONSUMPTION IN REGION	2020 MONTHWISE CONSUMPTION	2019 MONTH WISE CONSUMPTION	BOTTOM N	TOP N	TOTAL CONSUMPTION	2019 STATE CONSUMPTI
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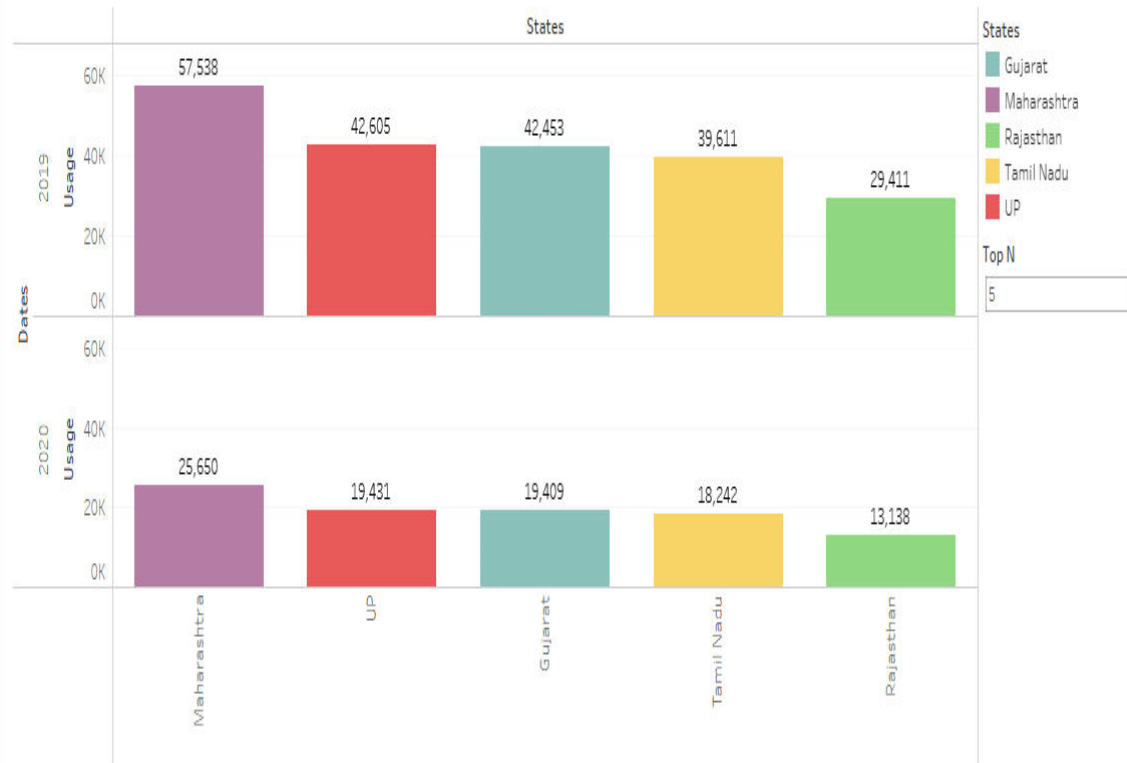




## Story 1



## Story 1



Story 1

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2020 MONTHWISE CONSUMPTION

2019 MONTH WISE CONSUMPTION

BOTTOM N

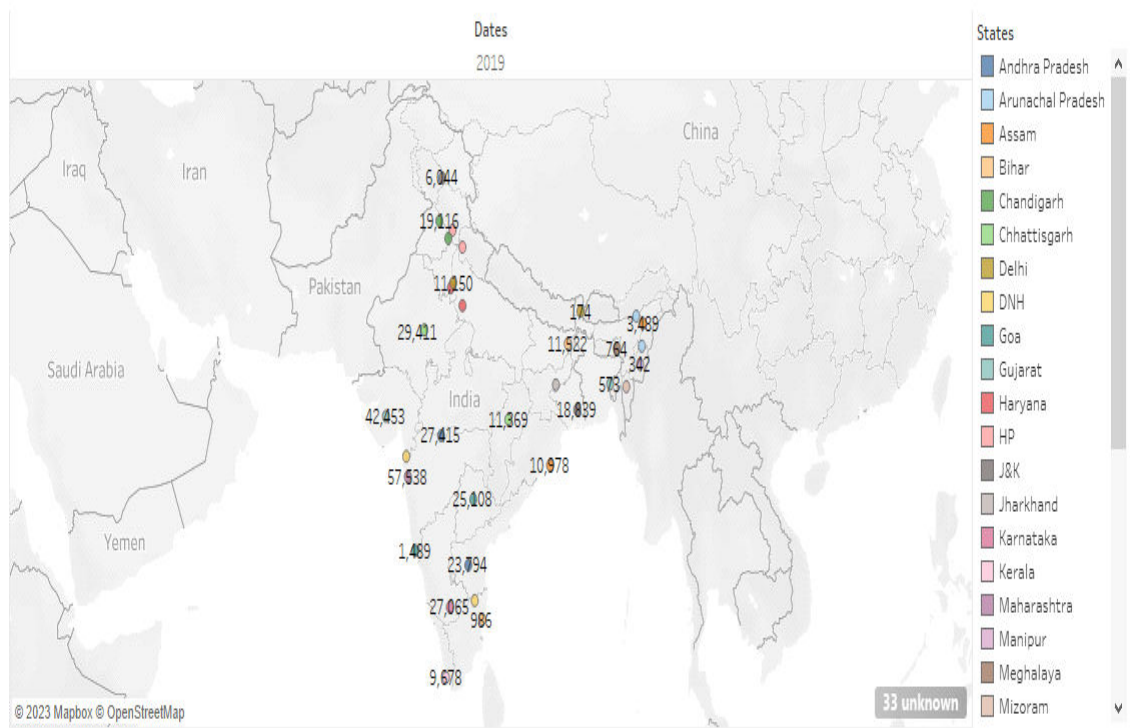
TOP N

2019 STATE CONSUMPTION

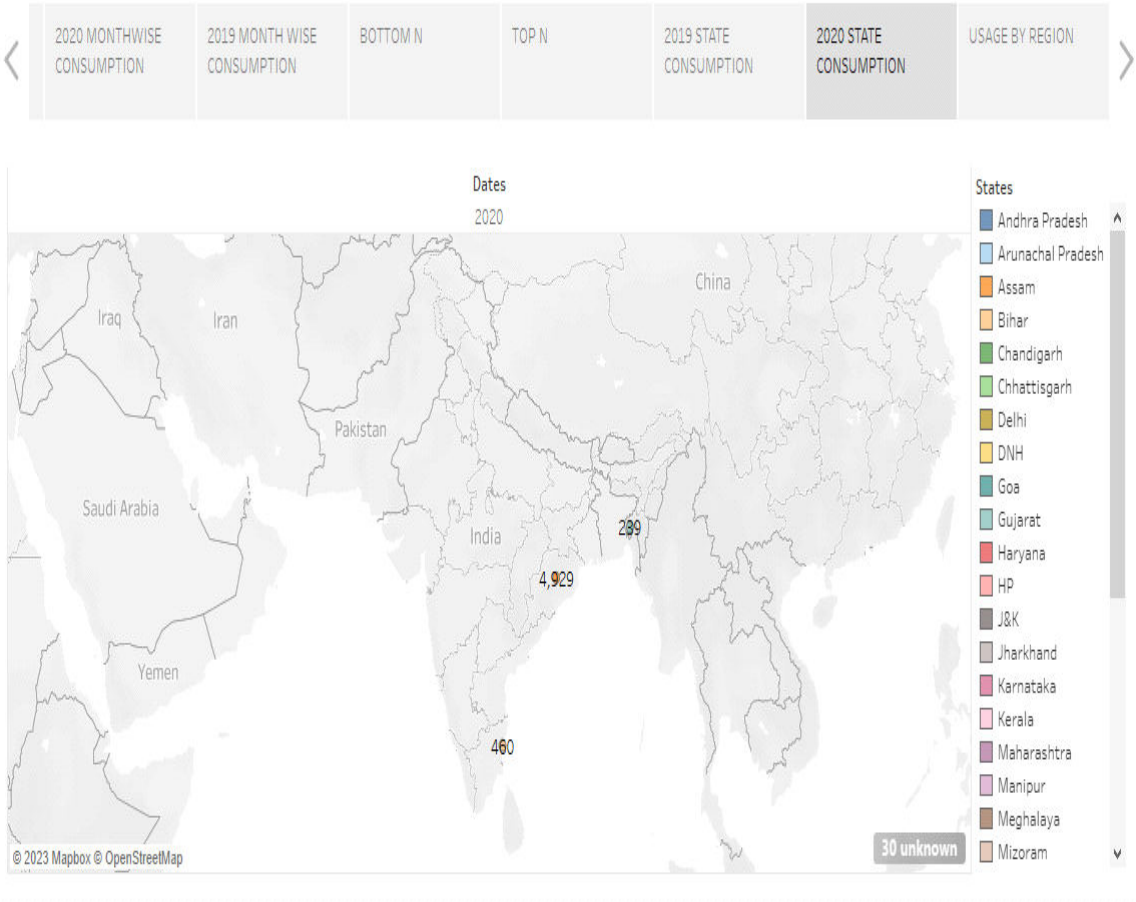
2020 STATE CONSUMPTION

USAGE BY REGION

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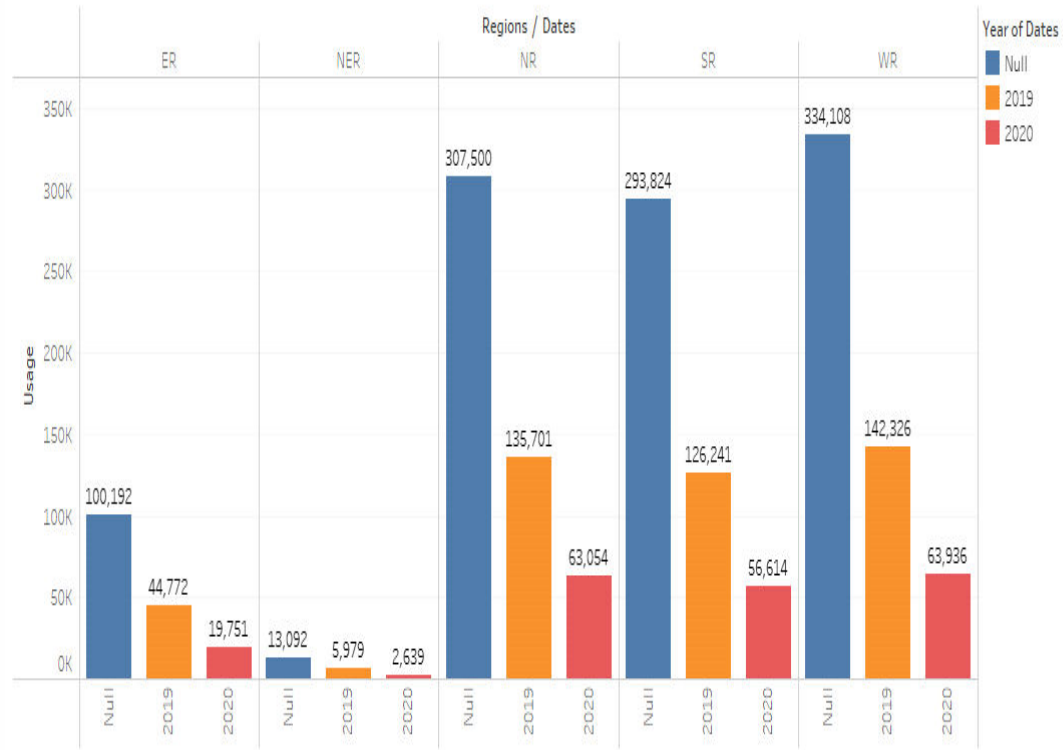


Story 1



# Story 1

<	2020 MONTHWISE CONSUMPTION	2019 MONTH WISE CONSUMPTION	BOTTOM N	TOP N	2019 STATE CONSUMPTION	2020 STATE CONSUMPTION	USAGE BY REGION	>
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## **ADVANTAGES**

**I** With the rapid growth of renewable energy over the last ten years, solar and wind power are now the cheapest sources of electricity in many parts of the world. In the United Arab Emirates an area well-known for its abundant land and sunny weather - a new sun farm recently secured the world's lowest price of solar energy at just 1.35c per kilowatt-hour.

**II** With an increasing focus on global warming and many governments setting ambitious carbon-reduction goals, one of the surprising renewable energy advantages is that it has quickly become a major source of new job growth.

## **DISADVANTAGES**

**I** Renewable energy systems rely on natural resources such as sunlight, wind, and water, and therefore, their electricity generation can be as unpredictable as the weather. Solar panels lose efficiency on cloudy days, wind turbines aren't effective in calm weather, and hydro power systems need consistent snow and rainfall to maintain reliable production.

**II** The efficiency of renewable energy systems also depends on their location and surrounding environment. For example, wind turbines are only effective in large, open areas with strong and consistent wind, which limits their viability to specific regions.

## **APPLICATIONS**

- 1. Constructions of buildings and structures for the convenience of people require electricity at every step. Building houses, installing gates and windows, and welding materials require current electricity to operate the machines.**
- 2. Reaching places or communicating from a different corner of the world is only possible because of electricity. A power cut during airline travel can be dangerous.**
- 3. For the production of various materials, the factory uses heavy machinery which always runs on electricity. Even the magnets, which are giant-like structures, require electricity to keep them charged for lifting heavy metals.**

### **CONCLUSION:**

**Energy is conserved to reduce consumption costs and to preserve the limited available energy resources. Energy conservation refers to efforts made to reduce energy on consumption. The supply of energy on Earth is not infinite. Furthermore, it can take a long time to regenerate energy.**

### **FUTURE SCOPE:**

**In the Stated Policies Scenario, global electricity demand grows at 2.1% per year to 2040, twice the rate of primary energy demand. This raises electricity's share in total final energy consumption from 19% in 2018 to 24% in 2040.**

## APPENDIX

### Source Code:

<file:///D:/SOLIDWORKS/Solidworks/hp/OneDrive/Desktop/new%20begin/Electricity%20Consumption%20Analysis/index.html>