

# **PUGGING INTO THE FUTURE AN EXPLORATION OF ELECTRICITY CONSUMPTION**

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# Plugging into the future - An exploration of electricity consumption

## INTRODUCTION

### 1.1 Overview

India is the world's third-largest producer and third-largest consumer of electricity. 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.

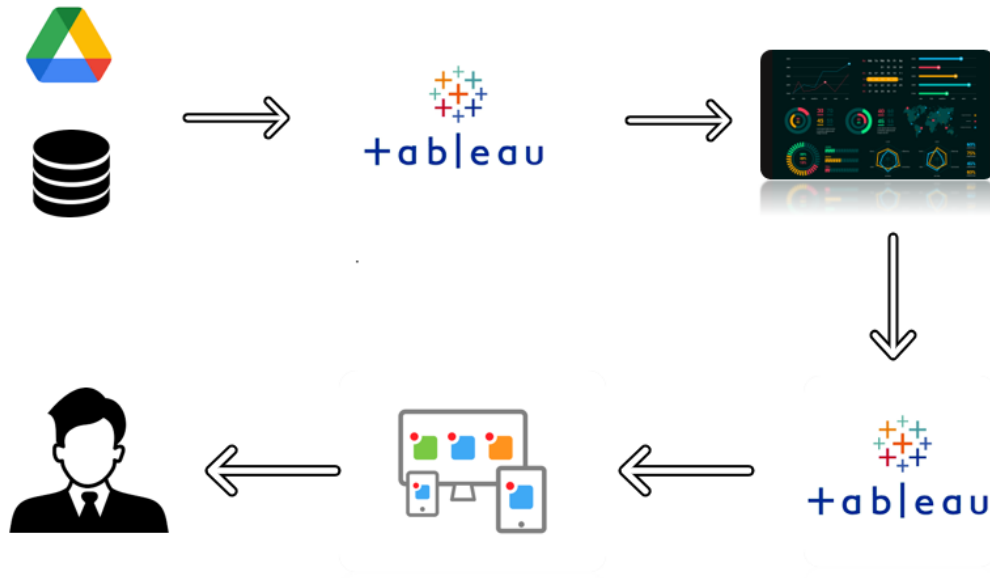
In 2015-16, electric energy consumption in agriculture was recorded as being the highest (17.89%) worldwide. The per capita electricity consumption is low compared to most other countries despite India having a low electricity tariff.

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 5<sup>th</sup> 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.

### Technical Architecture:

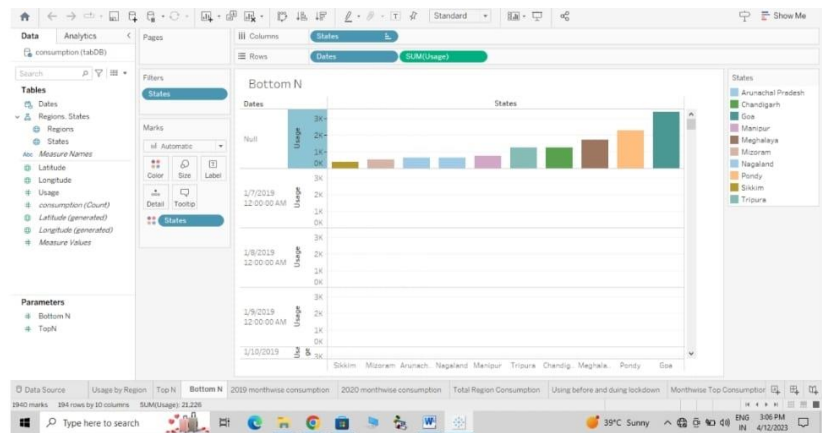
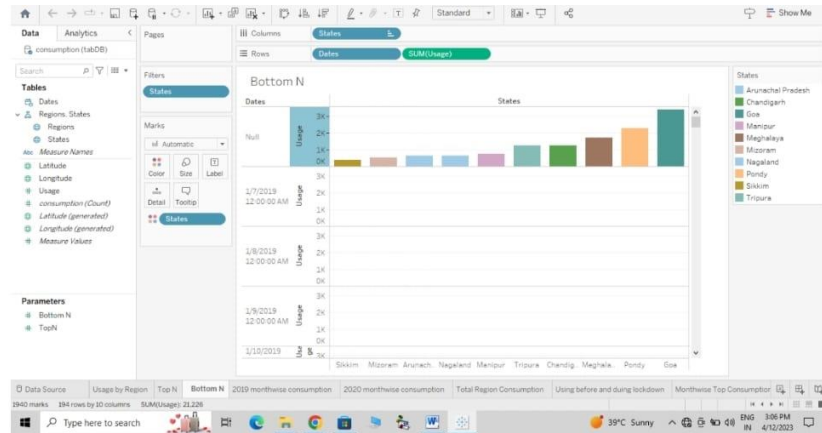
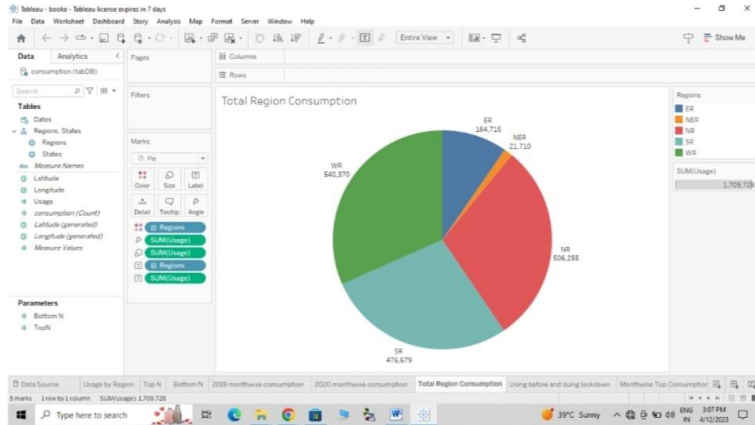


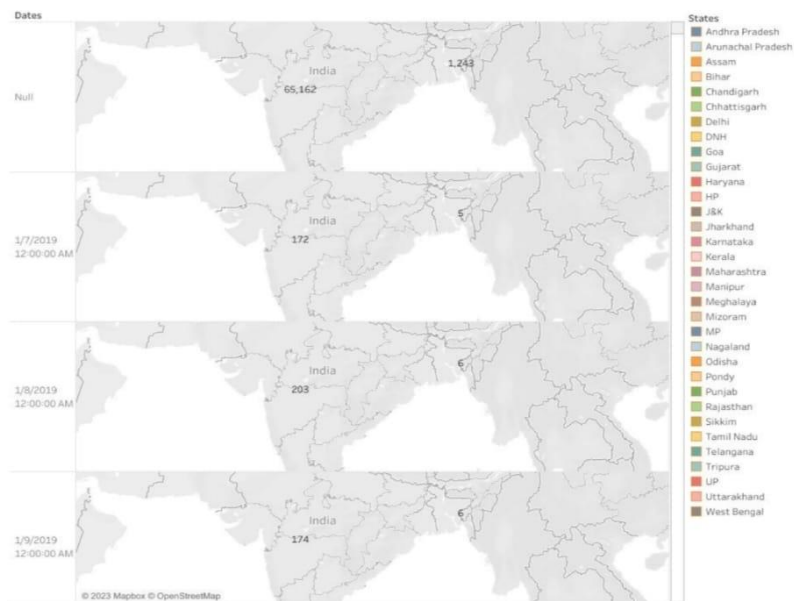
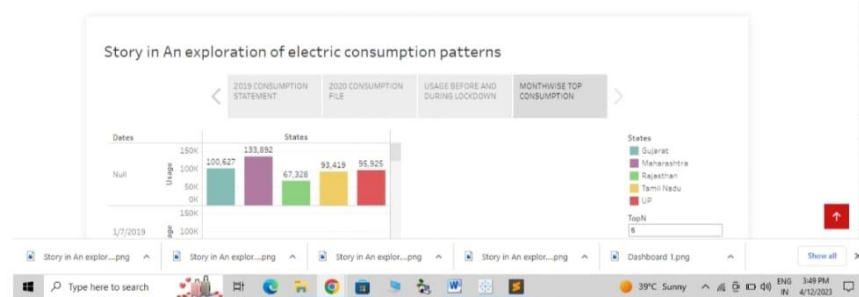
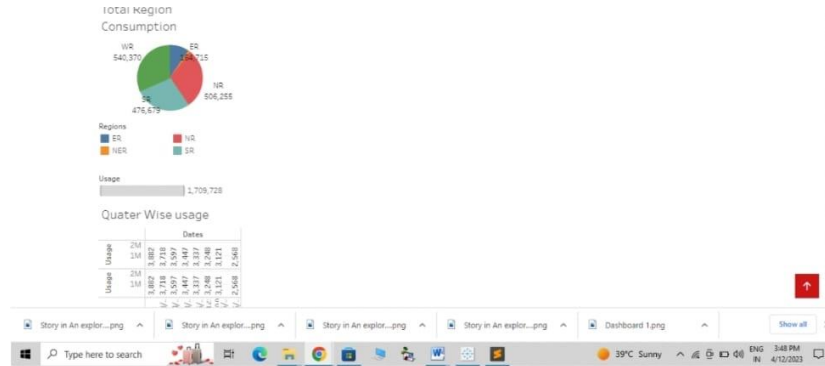
### 1.2 Purpose

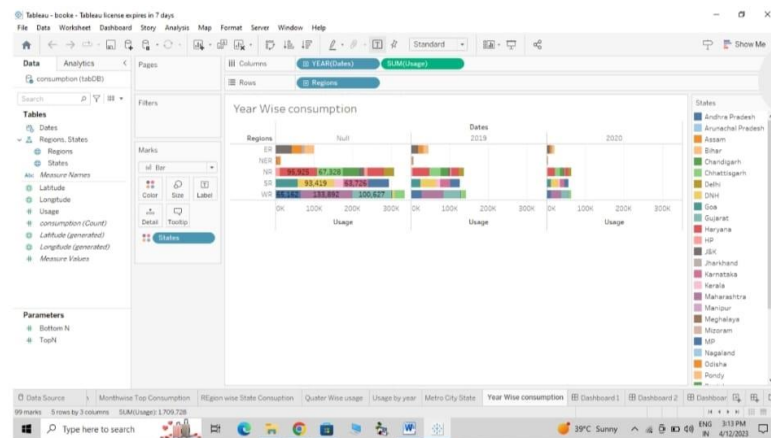
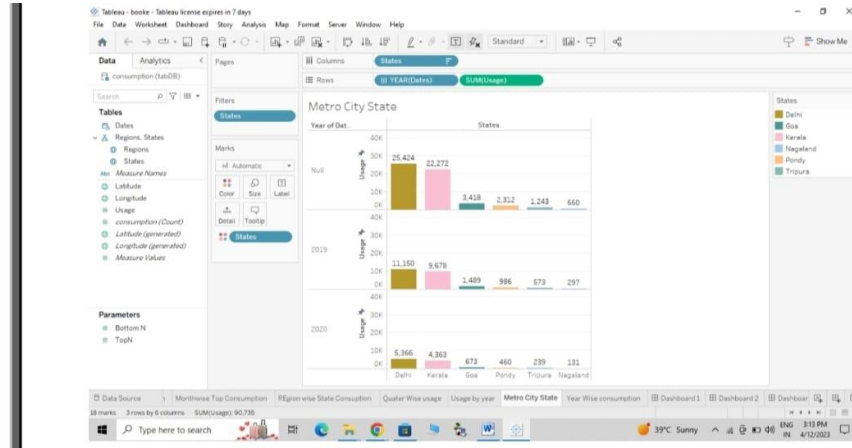
Annual electricity consumption per capita serves as an important measure of a country's electric power development. Generally speaking, electricity consumption grows faster when the industrialization process develops quickly and goes down rapidly when industrialization is completed or near completion



## RESULT







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## ADVANTAGES & DISADVANTAGE

### Advantages of Plugging into the future - an exploration of electricity consumption

Plugging into the future through the increased consumption of electricity offers numerous advantages, some of which include:

**Environmental Benefits:** The shift towards electricity consumption from traditional fuel sources such as coal or natural gas can significantly reduce greenhouse gas emissions and air pollution. Electricity generated from renewable sources such as solar or wind power is a cleaner and more sustainable alternative to fossil fuels.

**Economic Benefits:** The cost of renewable energy has continued to decrease over the years, and it is becoming increasingly competitive with traditional energy sources. This presents an opportunity for businesses and individuals to save on energy costs, reduce their carbon footprint, and improve their bottom line.

**Increased Efficiency:** Electric-powered devices and appliances are typically more efficient than their gas-powered counterparts. For instance, electric vehicles are known to be more efficient than traditional gasoline-powered vehicles, resulting in lower fuel costs and maintenance expenses.

**Convenience:** With the widespread availability of electric charging stations, it has become easier for individuals to switch to electric vehicles. Furthermore, the ability to charge electric vehicles at home or work means that one can avoid the inconvenience of filling up at gas stations.

#### **Improved Grid Resilience:**

The shift towards electricity consumption provides an opportunity to build more resilient and reliable power grids. By integrating smart grids, renewable energy sources, and energy storage solutions, it becomes easier to manage energy demand, improve system reliability, and enhance energy security.

#### **Disadvantages of Plugging into the future - an exploration of electricity consumption**

While electricity has revolutionized the world in countless ways, there are also several disadvantages associated with our dependence on it. Here are some of the key drawbacks of plugging into the future through increased electricity consumption:

**Environmental impact:** The generation of electricity often involves the burning of fossil fuels, which contributes to greenhouse gas emissions and climate change. In addition, the production and disposal of electronic devices and appliances can also have negative



environmental effects.

**Increased energy costs:** As we become more reliant on electricity, our energy consumption also increases. This can lead to higher energy bills, especially during periods of peak demand.

**Electrical grid vulnerabilities:** The power grid is vulnerable to disruptions caused by severe weather events, cyberattacks, and other factors. In extreme cases, these disruptions can lead to widespread power outages, which can have serious economic and social consequences.

**Health impacts:** The production and transmission of electricity can have negative impacts on human health, such as exposure to electromagnetic fields and air pollution.

**Resource depletion:** The production of electricity requires the use of natural resources, such as coal and natural gas. As these resources become scarcer, the cost of producing electricity may increase, which could have economic impacts.

**Energy security:** Countries that rely heavily on imported energy sources are vulnerable to supply disruptions and price shocks. This can have serious economic and geopolitical implications.

## APPLICATIONS

### **Applications of Plugging into the future - an exploration of electricity consumption**

Electricity consumption is a topic of great importance as our reliance on technology and energy consumption continues to grow. Plugging into the future refers to exploring the various ways we can use and manage electricity consumption to create a more sustainable and efficient world. Here are some applications of plugging into the future:

**Smart Grids:** Smart grids use advanced technology to manage electricity consumption and distribution. They allow for two-way communication between the power supplier and consumer, enabling

real-time monitoring of energy usage, and providing greater control over energy consumption. This technology helps to reduce energy waste and costs, and also ensures a more reliable and efficient energy supply.

**Renewable Energy:** As we move towards a more sustainable future, the use of renewable energy sources such as wind and solar power is becoming increasingly popular. These energy sources generate electricity with minimal impact on the environment, reducing our reliance on non-renewable sources like coal and oil. By plugging into renewable energy, we can create a more sustainable future with a reduced carbon footprint.

**Electric Vehicles:** With the increasing popularity of electric vehicles, the need for charging infrastructure has grown. By plugging into electric vehicles, we can reduce our reliance on fossil fuels, decrease emissions and air pollution, and create a more sustainable transportation system.

**Energy Storage:** As renewable energy sources such as solar and wind power are weather-dependent, energy storage is becoming increasingly important. Energy storage allows us to store excess energy generated during peak times for use when demand is high or when renewable sources are not available. By plugging into energy storage, we can create a more reliable and sustainable energy system.

**Energy Efficiency:** Improving energy efficiency in homes and buildings is another important application of plugging into the future. By using energy-efficient appliances and technologies, we can reduce energy waste and lower our carbon footprint. This can be achieved through the use of LED lighting, efficient heating and cooling systems, and smart home automation.

## CONCLUSION

Current through a given area of a conductor is the net charge that passes per unit time through the conductor. To keep up a gradual current, we must have a circuit within which an electrical phenomenon occurs from lower to higher mechanical energy.

Electricity is an essential part of modern life and important to the U.S.

economy. People use electricity for lighting, heating, cooling, and refrigeration and for operating appliances, computers, electronics, machinery, and public transportation systems.

## 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. Electricity demand growth is set to be particularly strong in developing economies.

The Indian power sector is forecasted to attract investments worth \$128.24-135.37 Bn between FY19-23. The future of the sector looks bright since by 2026-27 the country's power generation installed capacity will close to 620 GW, of which 38 % will be from coal and 44% from renewable energy sources.

## APPENDIX

### A. Source Code

Excel sheet link

[https://drive.google.com/file/d/1JxIkHNwXxjFztKq7ad0\\_KtkukCqTckNy/view](https://drive.google.com/file/d/1JxIkHNwXxjFztKq7ad0_KtkukCqTckNy/view)



