Plugging into the Future: An Exploration of Electricity Consumption Patterns

1.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.

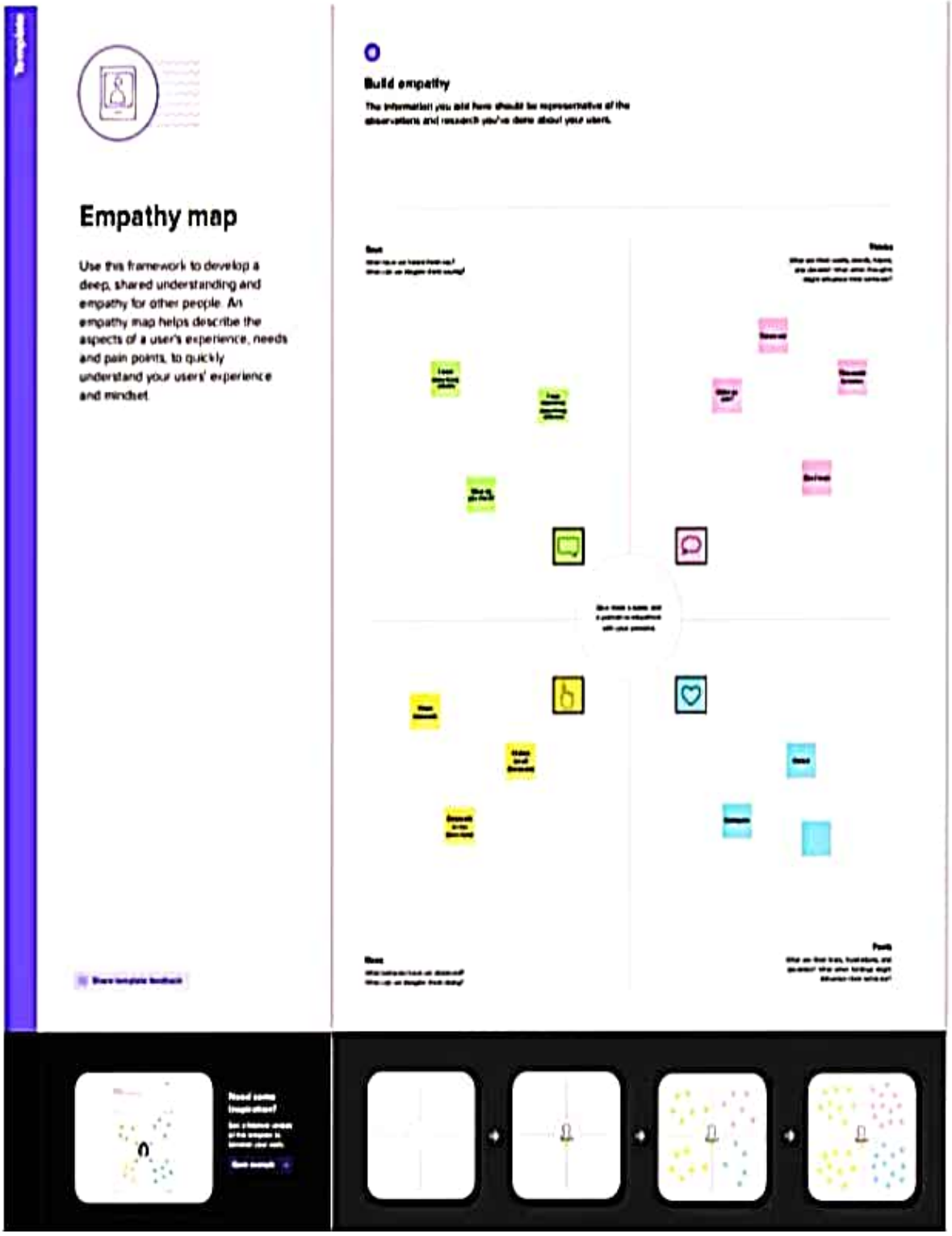
1.2 Purpose

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

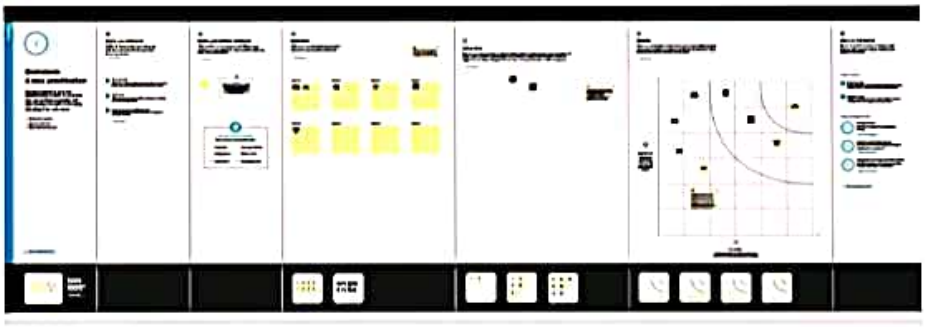
Reducing energy use in your home saves you money, increases our energy security, and reduces the pollution that is emitted from non-renewable sources of energy.

2. Problem Definition & Design Thinking

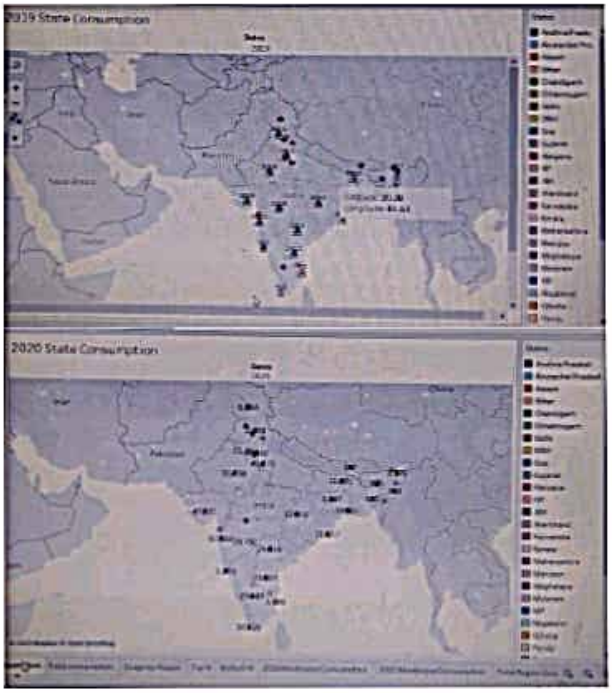
2.1 Empathy Map

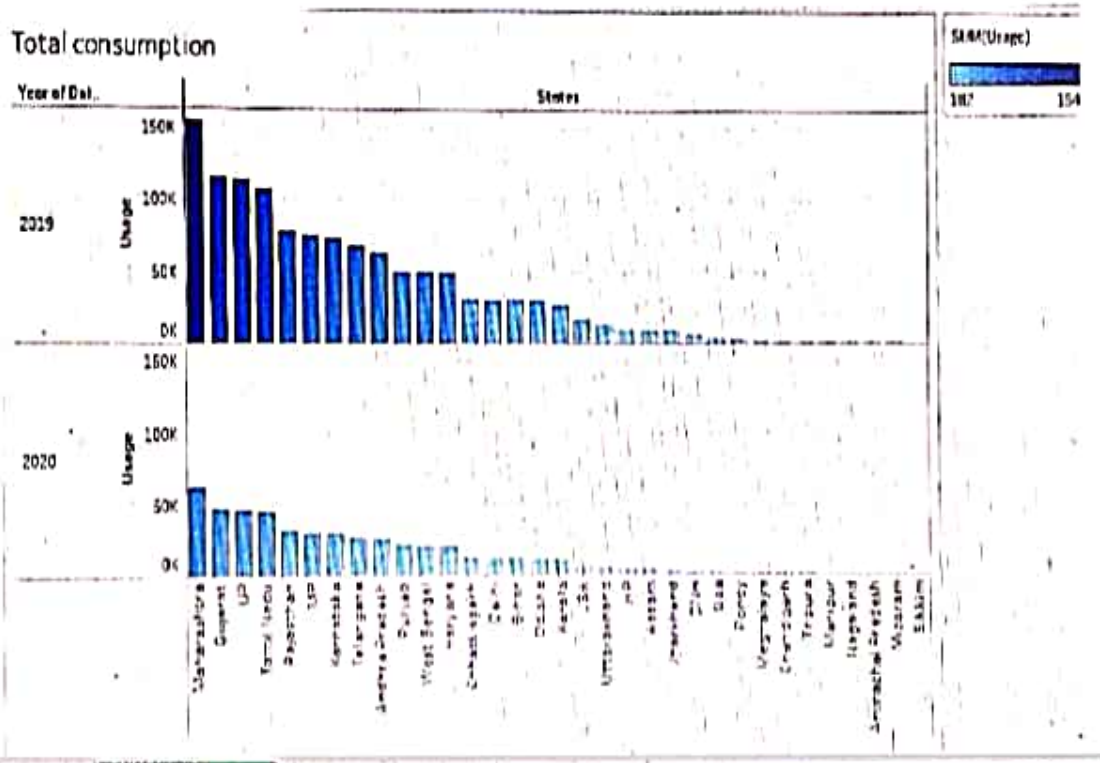


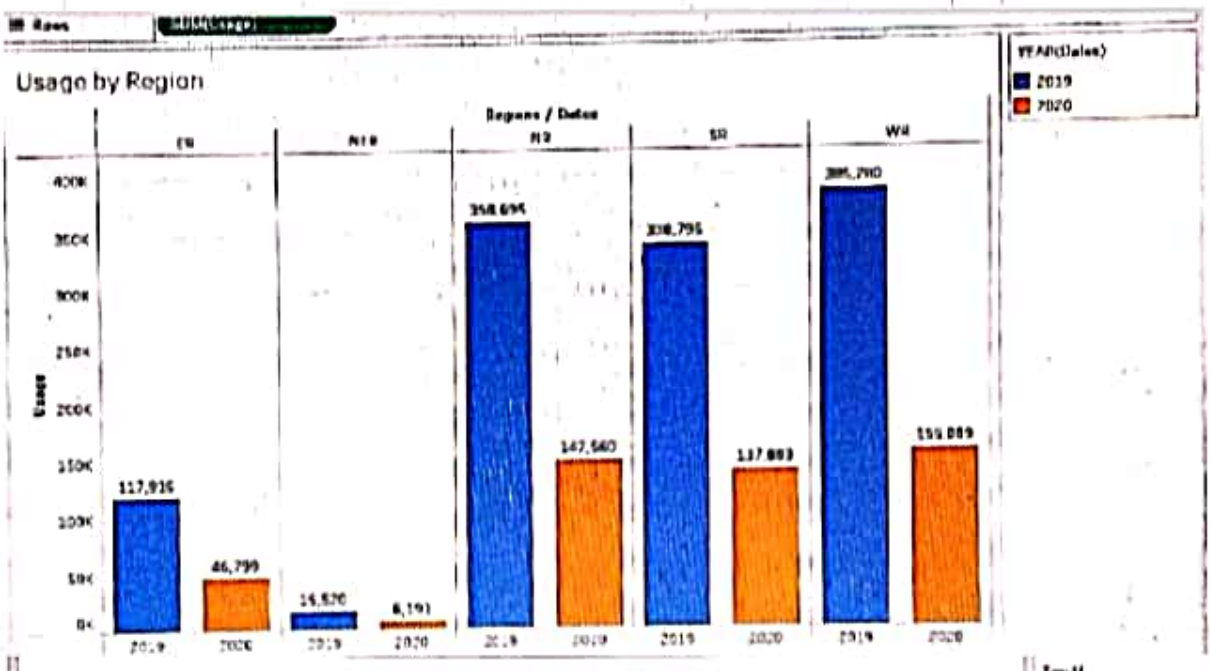
2.2 Ideation & Brainstorming Map

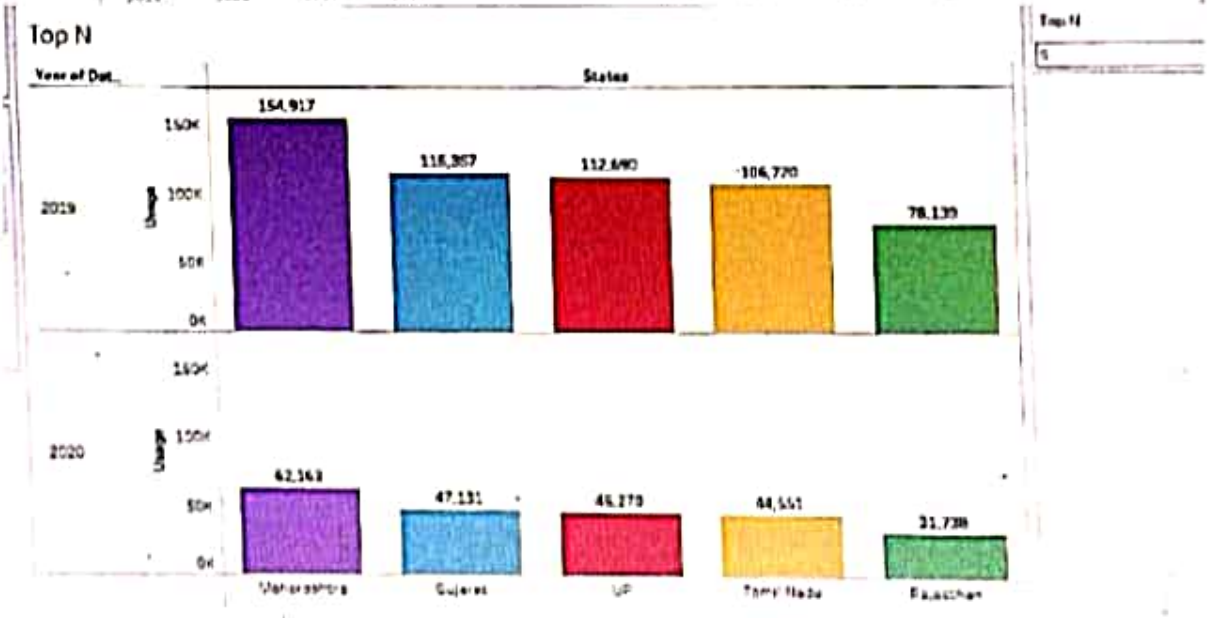


3. RESULTS

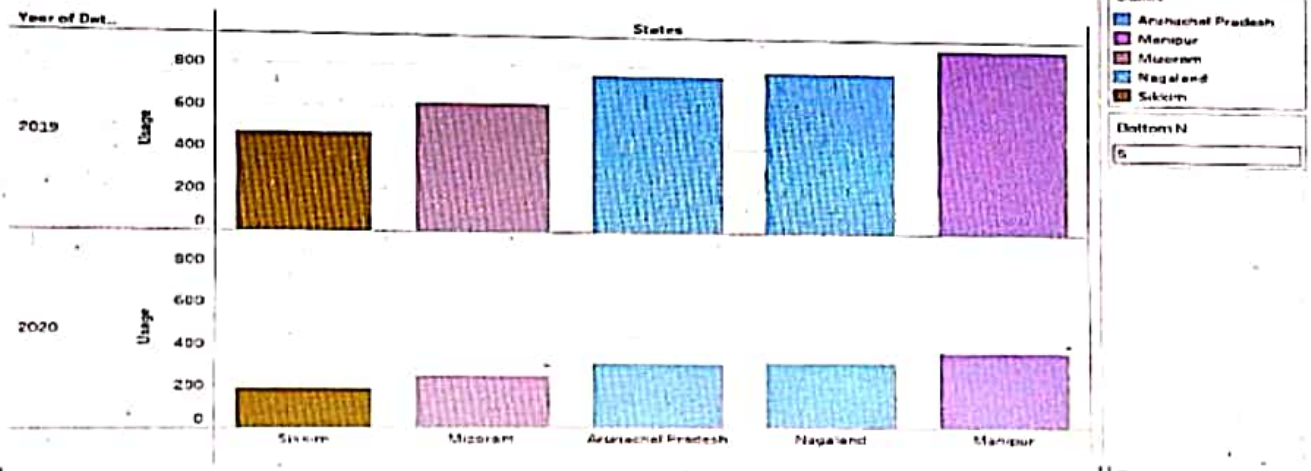



Total consumption
Year of Dat..
States
2019
2020
Usage
150K
100K
50K
0K

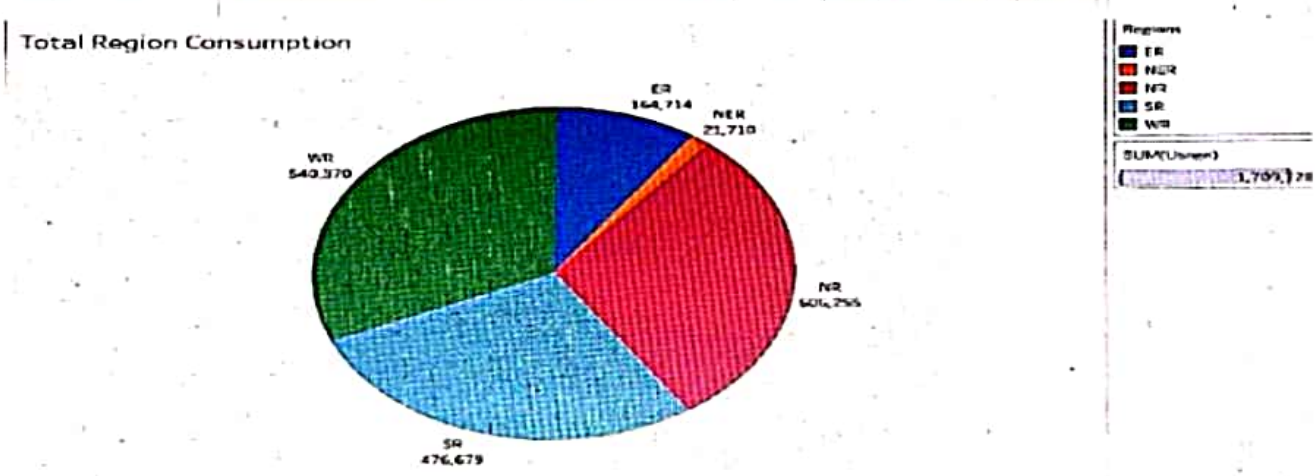

Usage by Region
Regions / Dates
ER
NER
NR
SR
WR
Usage
117,916
46,799
16,870
6,191
358,695
147,560
338,795
137,883
386,790
159,889


Top N
Year of Dat..
States
2019
2020
Usage
154,917
118,357
112,690
106,720
78,139
62,163
47,131
45,279
44,541
31,738

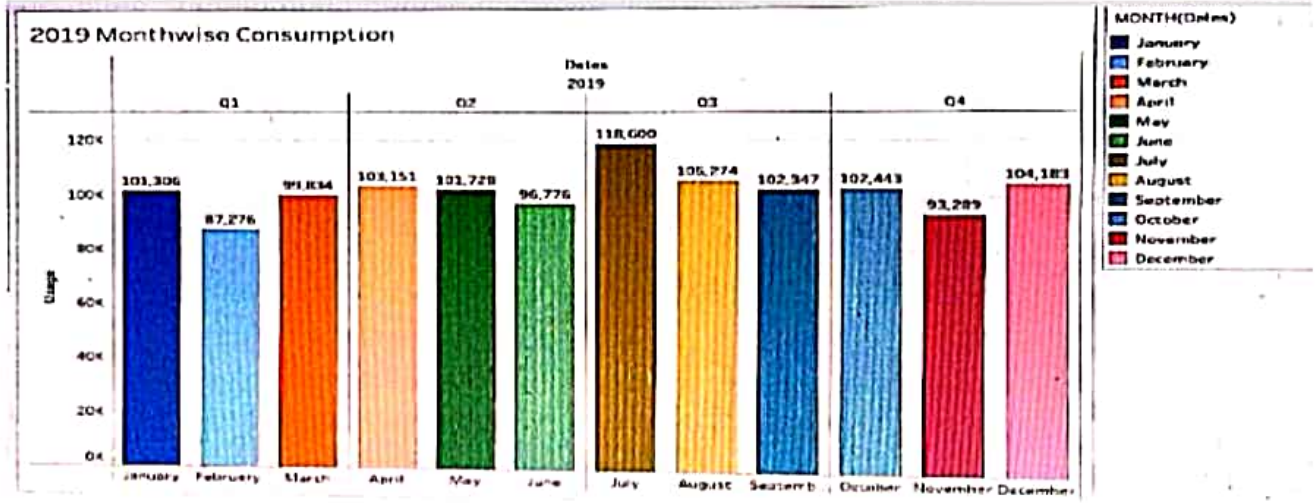
Bottom N

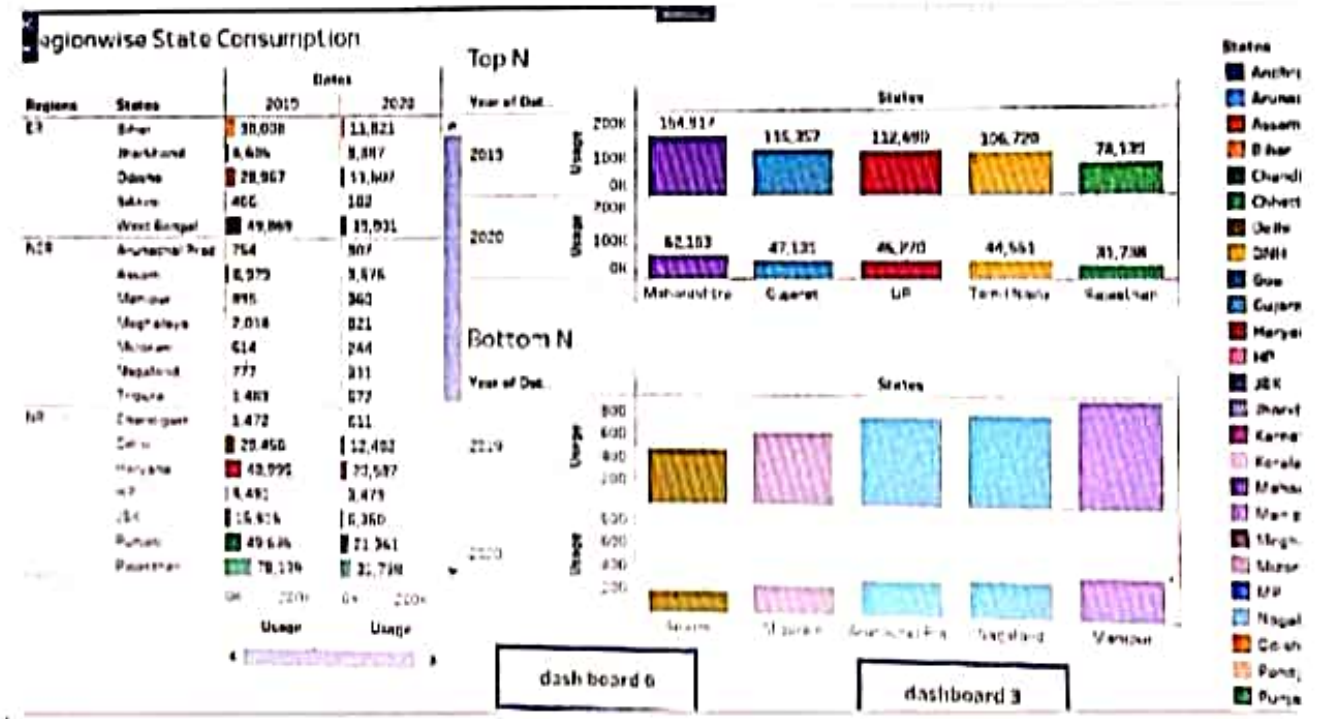


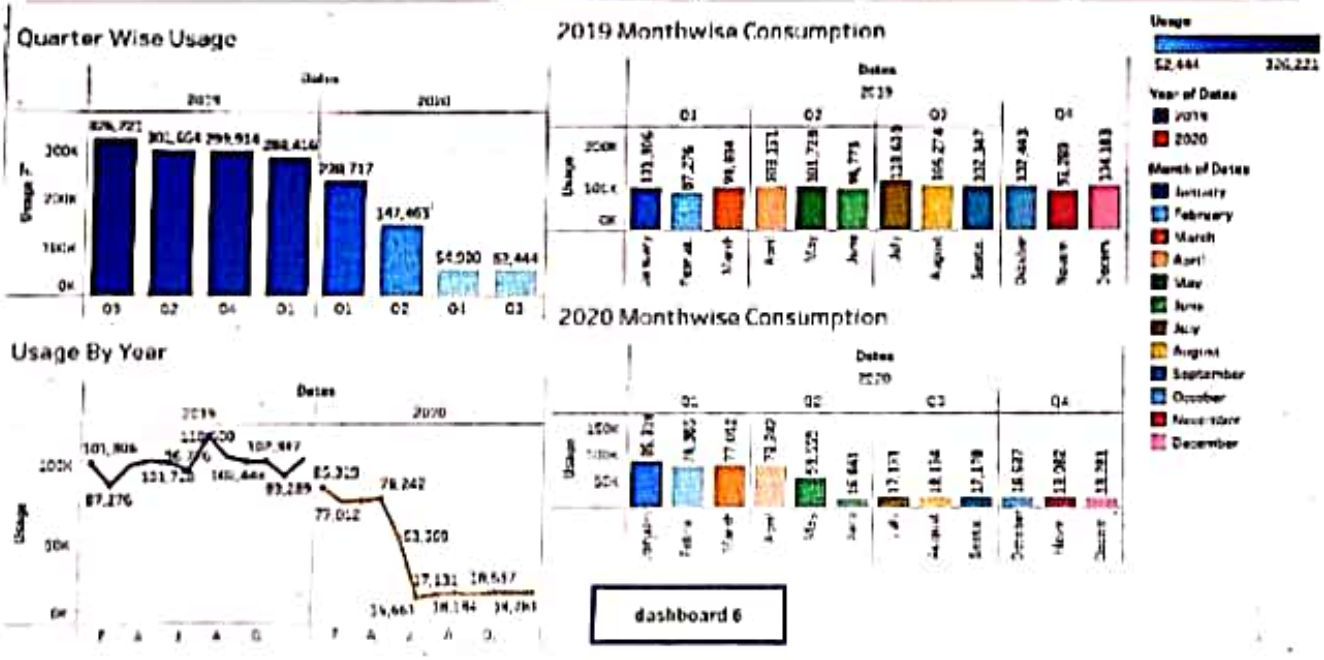
Total Region Consumption

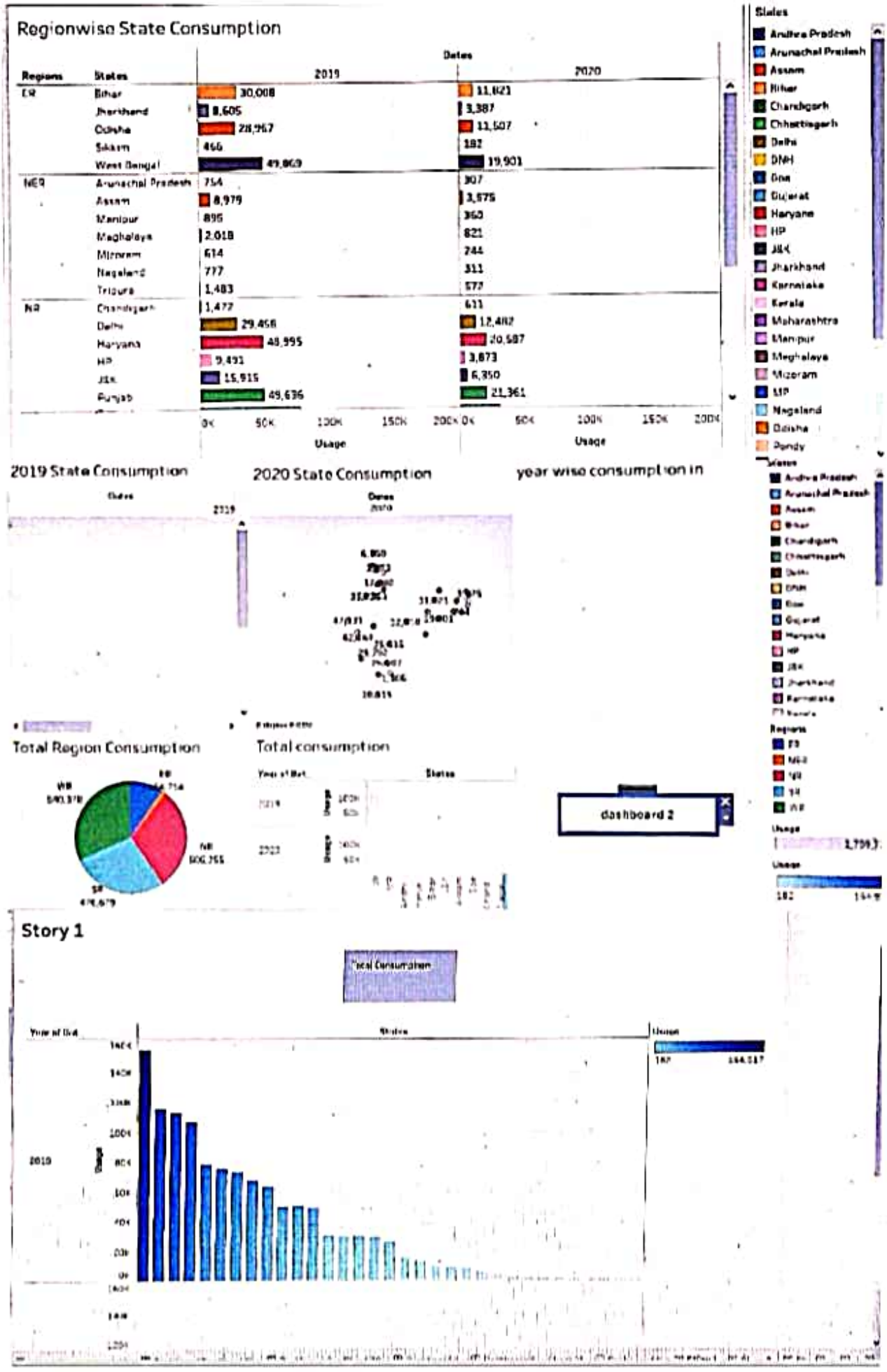


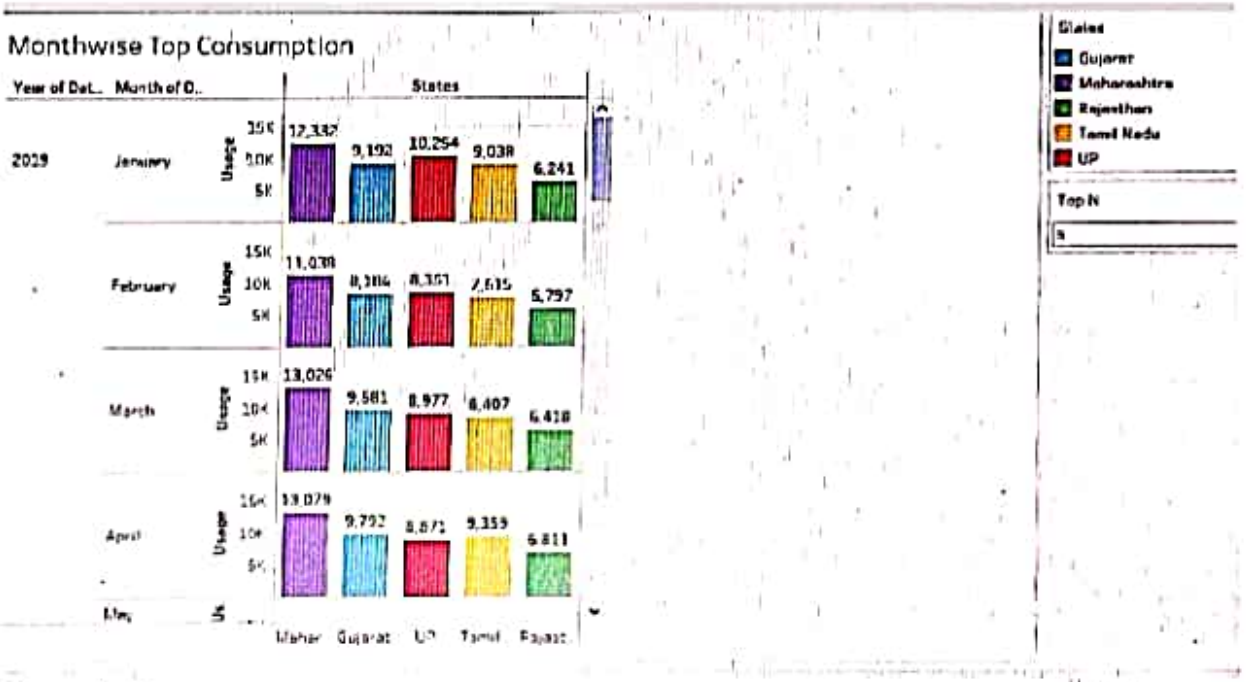
2019 Monthwise Consumption

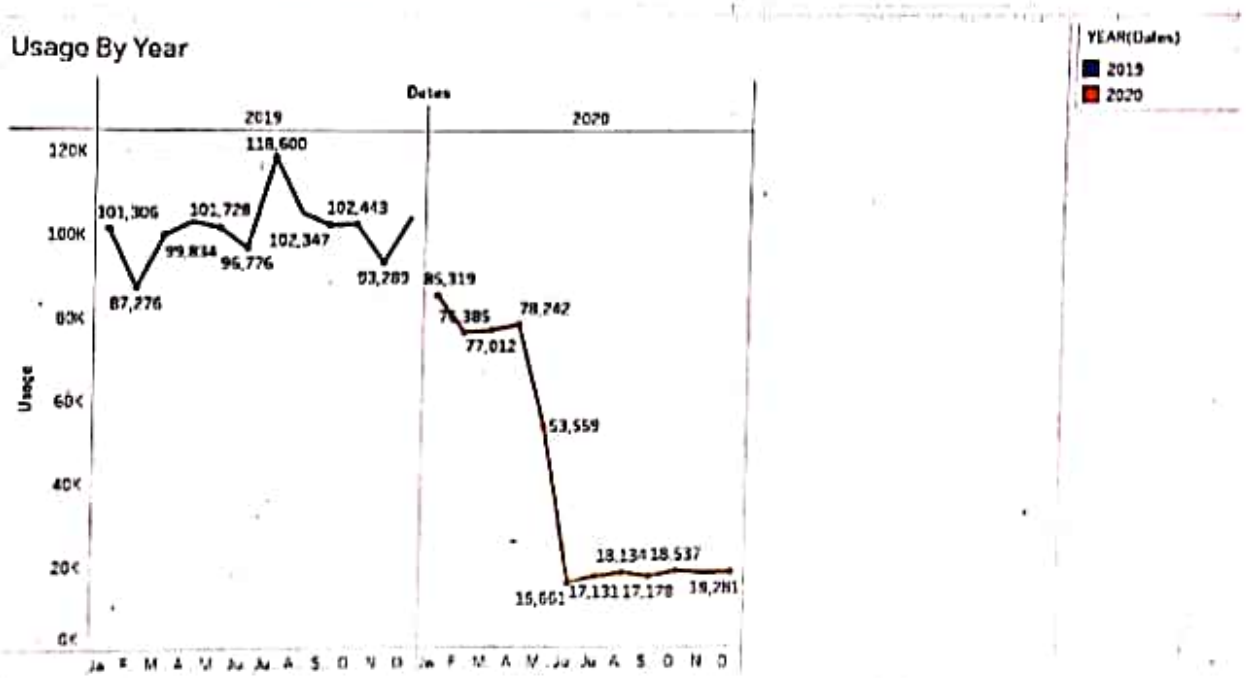


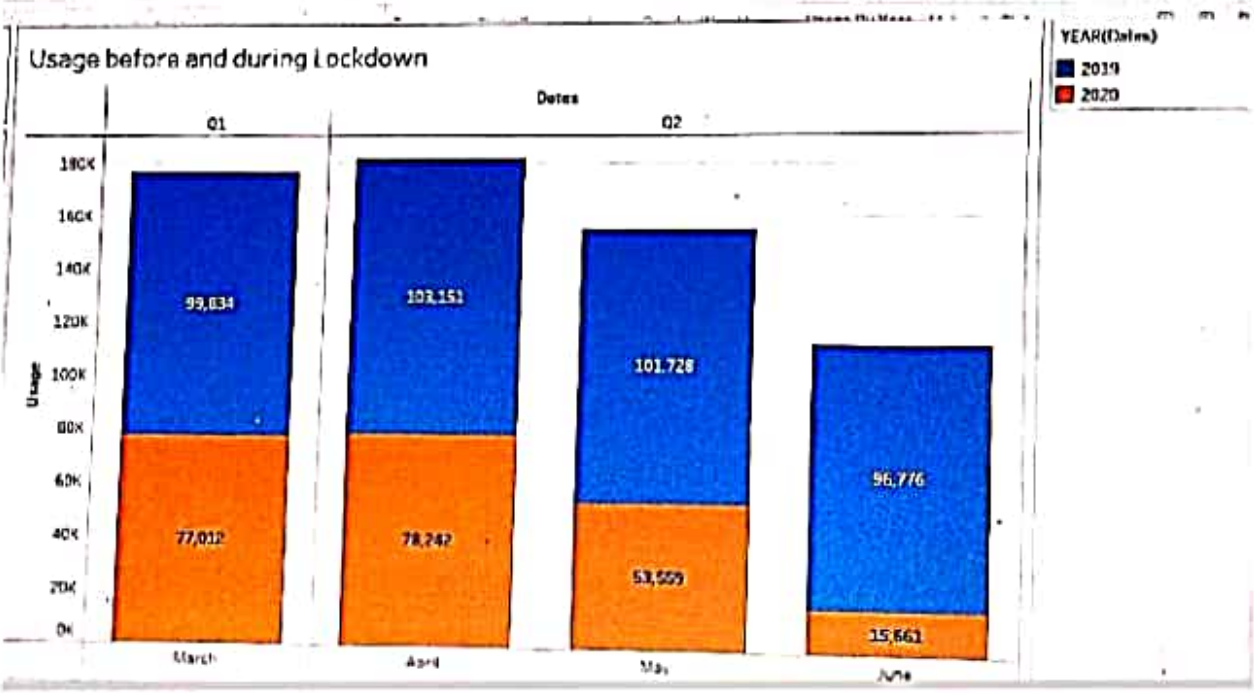

Regionwise State Consumption
Top N
Bottom N
States
dash board 6
dashboard 3

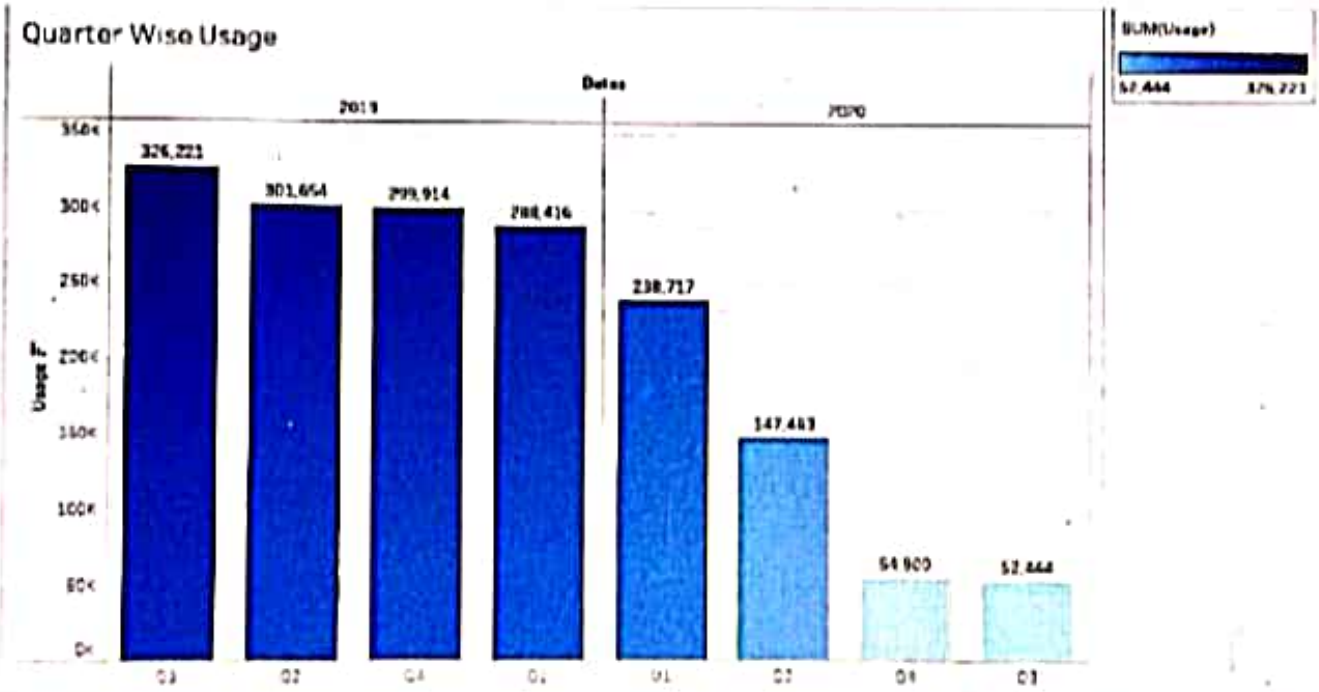

Quarter Wise Usage
2019 Monthwise Consumption
2020 Monthwise Consumption
Usage By Year
dashboard 6

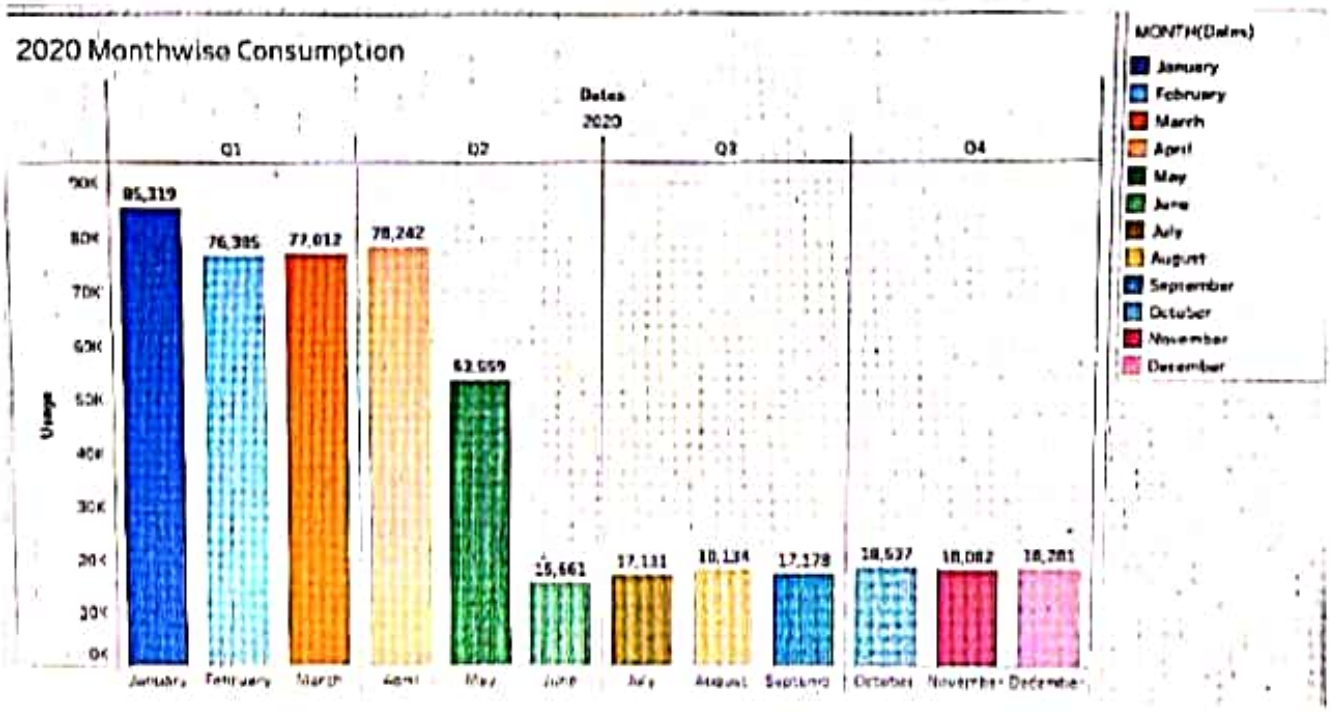

Regionwise State Consumption
Regions
States
Dates
2019
2020
ER
Bihar
30,008
11,821
Jharkhand
8,605
3,387
Odisha
28,967
11,507
Sikkim
466
182
West Bengal
49,869
19,901
NER
Arunachal Pradesh
754
307
Assam
8,979
3,575
Manipur
895
360
Meghalaya
2,018
821
Mizoram
614
244
Nagaland
777
311
Tripura
1,483
577
NR
Chandigarh
1,477
611
Delhi
29,466
12,482
Haryana
48,995
20,587
HP
9,491
3,873
J&K
15,915
6,350
Punjab
49,636
21,361
0K
50K
100K
150K
200K
Usage
States
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
DNH
Goa
Gujarat
Haryana
HP
J&K
Jharkhand
Karnataka
Kerala
Maharashtra
Manipur
Meghalaya
Mizoram
MP
Nagaland
Odisha
Pondy
2019 State Consumption
2020 State Consumption
year wise consumption in
Total Region Consumption
Total consumption
dashboard 2
Story 1
Total Consumption
Year of Dat
States
Usage
2019
Usage


Monthwise Top Consumption
Year of Dat..
Month of D..
States
2019
January
February
March
April
Usage
12,332
9,192
10,254
9,038
6,241
11,038
8,384
8,351
7,635
5,797
13,029
9,581
8,977
8,407
6,418
9,792
8,871
9,359
Maha
Gujarat
UP
Tamil
Rajast
States
Gujarat
Maharashtra
Rajasthan
Tamil Nadu
UP
Top N


Usage By Year
Dates
2019
2020
120K
100K
80K
60K
40K
20K
0K
Usage
101,306
87,276
99,834
101,728
96,776
118,600
102,347
102,443
93,289
85,319
77,012
78,242
53,559
18,134
18,537
15,661
17,131
17,178
YEAR(Dates)
2019
2020


Usage before and during Lockdown
Dates
Q1
Q2
180K
160K
140K
120K
100K
80K
60K
40K
20K
0K
Usage
99,834
77,012
102,351
78,242
101,728
53,559
96,776
15,661
March
April
May
June
YEAR(Dates)
2019
2020


Quarter Wise Usage
Dates
2019
2020
SUM(Usage)
326,221
301,664
299,914
288,416
238,717
147,483
64,900
52,444
Usage
Q3
Q2
Q4
Q1
Q1
Q2
Q3
Q4


2020 Monthwise Consumption
Dates
2020
Q1
Q2
Q3
Q4
MONTH(Dates)
January
February
March
April
May
June
July
August
September
October
November
December
Usage
85,319
76,385
77,012
78,242
62,059
15,661
17,131
18,134
17,178
18,537
18,082
18,281

4.ADVANTAGES & DISADVANTAGES

Advantages:

1.Lower maintenance cost.

2.More efficient.

3.No tailpipe emission.

4.We all know that it can be set up in many sizes.

Disadvantages:

1.More expensive than gasoline.

2.Loss of fish species.

3.Sometimes messes up wildlife.

4.Dependent on precipitation.

5.APPLICATIONS

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

6.CONLUSION

Electricity is the backbone of modern society. Our life will go back to the primitive age without electricity. There is a need for rational use of electricity, as it is largely produced from non- renewable sources like coal and water.

7.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.