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. 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 economic activities have been faced by every sector in a positive or a negative way.

The dataset is exhaustive in its demonstration of every consumption state wise.

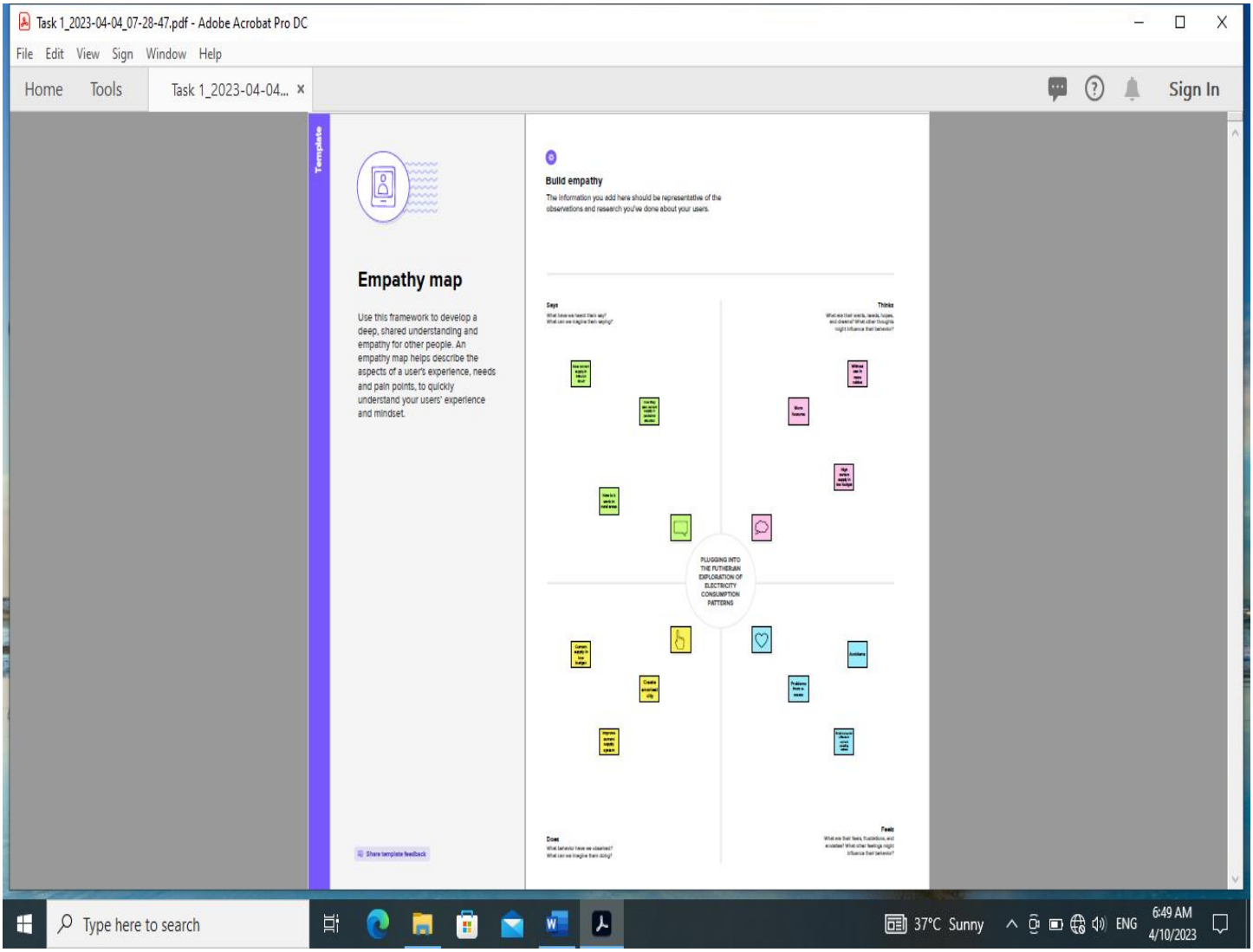
Analysing the electricity consumption in India from Jan 2019 till 5th December 2020. This dataset contains a record of Electricity Consumption in every states of India. Here we are going to analyse State wise, Region wise and Overall Electricity Consumption in India.

1.2 Purpose

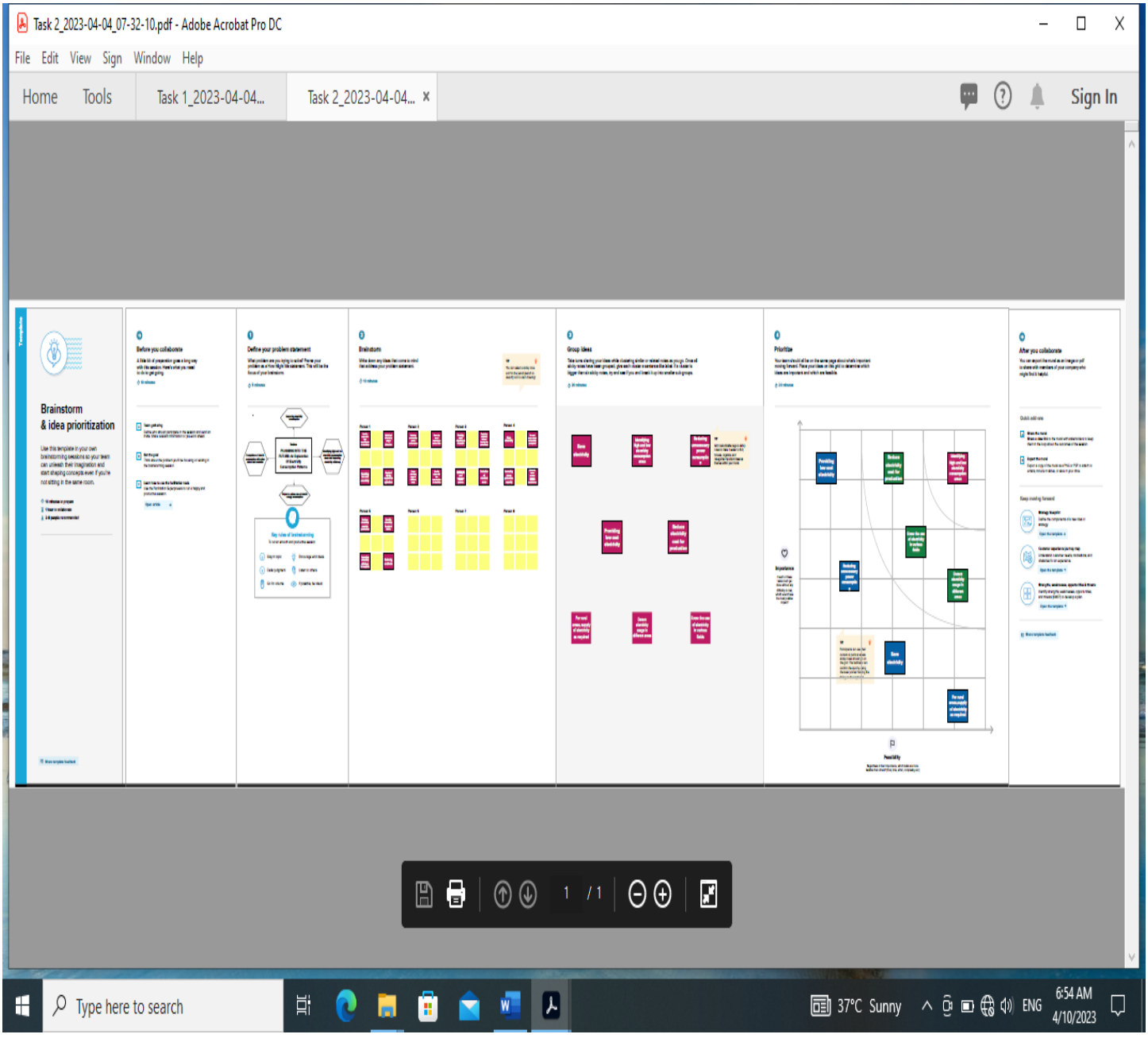
- Identifying high and low electricity consumption areas and improving electricity efficiency.
- Comparison of electricity consumption with other states and countries.
- Project to reduce use of electric energy consumption.
- Improving electricity consumption.
- Reducing unnecessary power consumption.
- For rural areas, supply of electricity as required.

2.Problem Definition and Design Thinking

2.1 Empathy Map

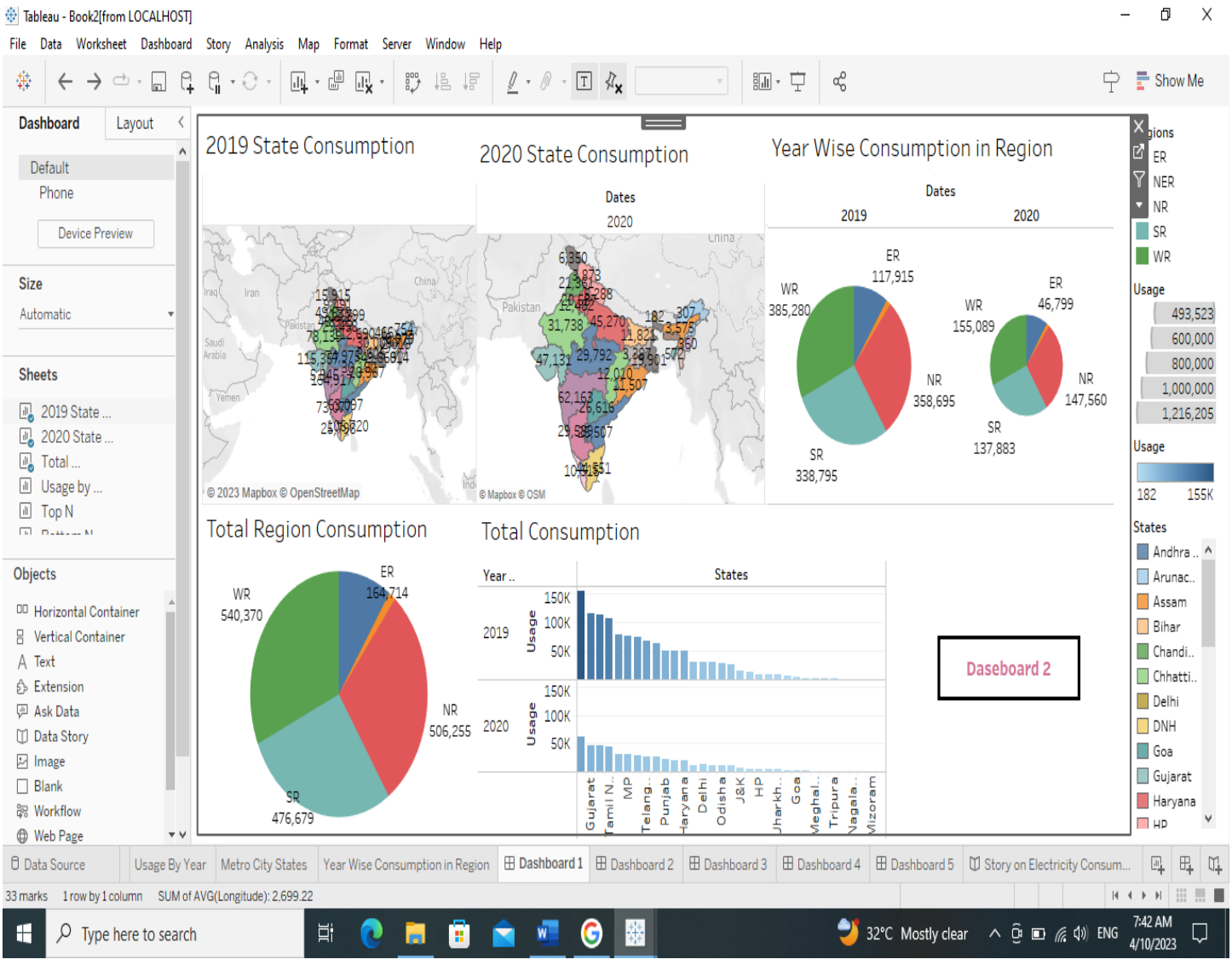


2.2 Ideation and Brainstorming Map:



3.RESULT

Dashboard:



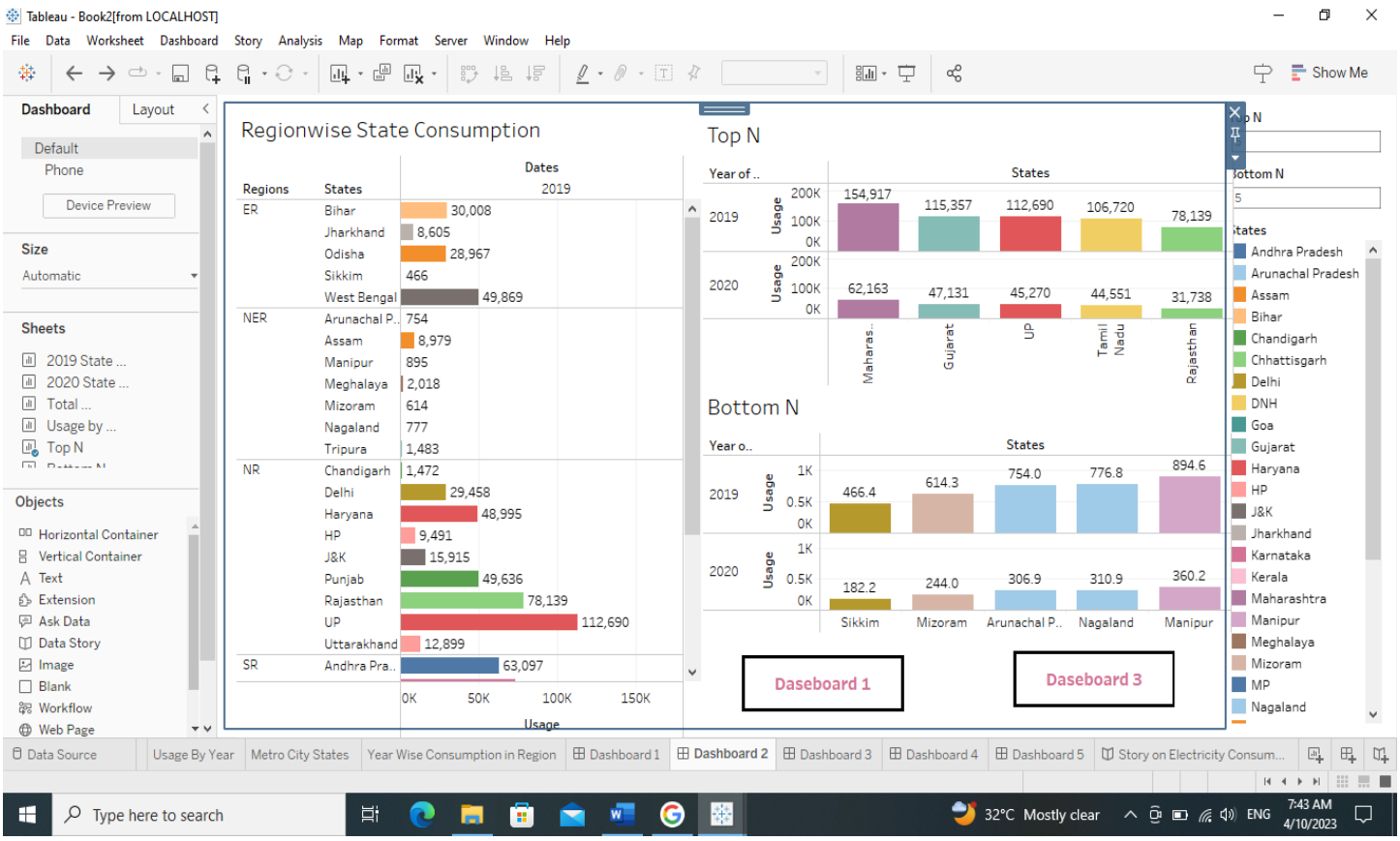


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Show Me
Dashboard Layout
Default
Phone
Device Preview
Size
Automatic
Sheets
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Objects
Horizontal Container
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page
Regionwise State Consumption
Regions
States
Dates
2019
ER
Bihar 30,008
Jharkhand 8,605
Odisha 28,967
Sikkim 466
West Bengal 49,869
NER
Arunachal P.. 754
Assam 8,979
Manipur 895
Meghalaya 2,018
Mizoram 614
Nagaland 777
Tripura 1,483
NR
Chandigarh 1,472
Delhi 29,458
Haryana 48,995
HP 9,491
J&K 15,915
Punjab 49,636
Rajasthan 78,139
UP 112,690
Uttarakhand 12,899
SR
Andhra Pra.. 63,097
0K 50K 100K 150K
Usage
Top N
Year of ..
States
2019
2020
Usage
200K
100K
0K
154,917
115,357
112,690
106,720
78,139
62,163
47,131
45,270
44,551
31,738
Maharas..
Gujarat
UP
Tamil Nadu
Rajasthan
Bottom N
Year o..
1K
0.5K
466.4
614.3
754.0
776.8
894.6
182.2
244.0
306.9
310.9
360.2
Sikkim
Mizoram
Arunachal P..
Nagaland
Manipur
Daseboard 1
Daseboard 3
Bottom N
5
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
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consum...
Type here to search
32°C Mostly clear
ENG
7:43 AM
4/10/2023

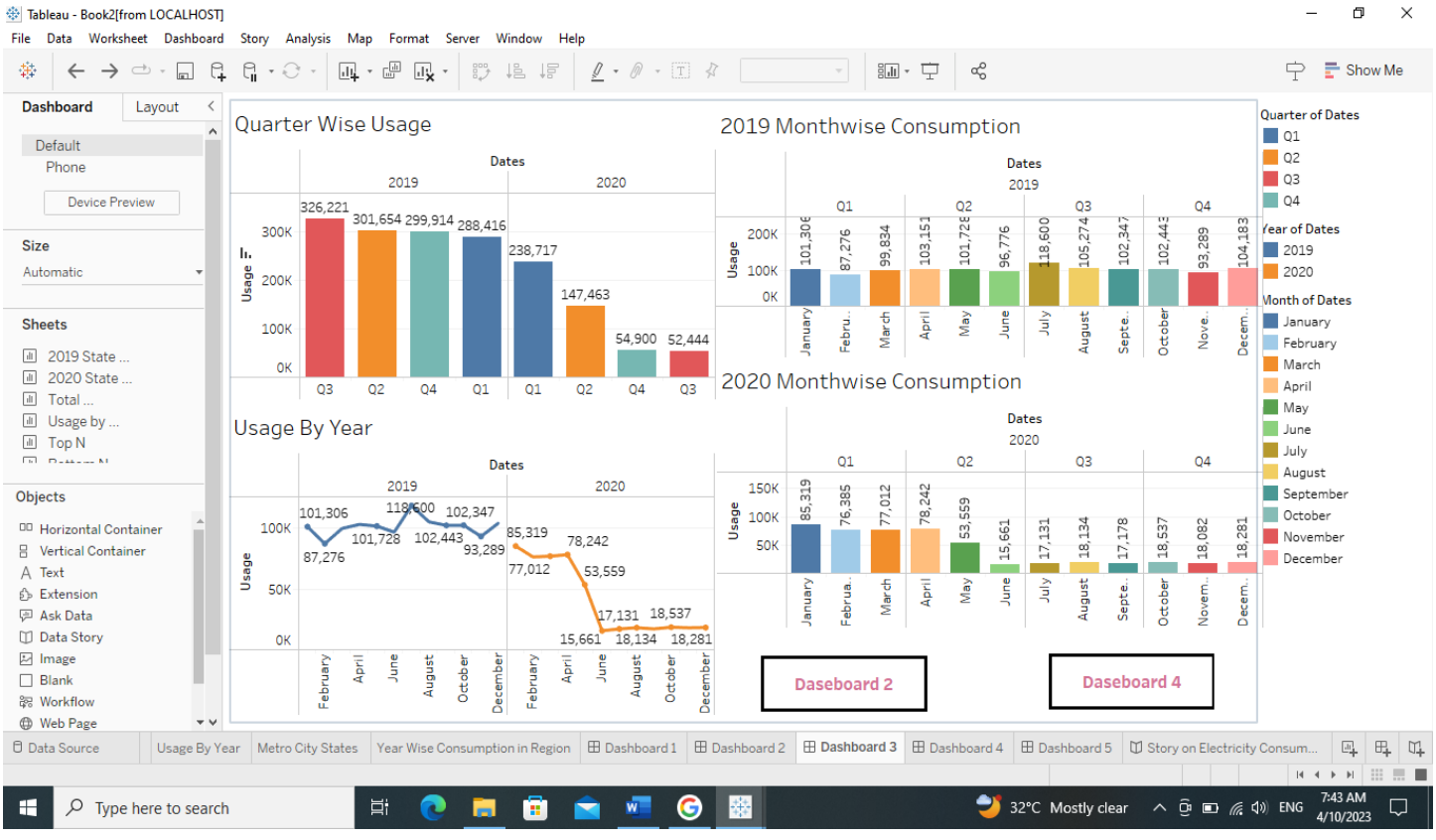


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Show Me
Dashboard Layout
Default
Phone
Device Preview
Size
Automatic
Sheets
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Objects
Horizontal Container
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page
Quarter Wise Usage
Dates
2019
2020
Usage
300K
200K
100K
0K
326,221
301,654
299,914
288,416
238,717
147,463
54,900
52,444
Q3 Q2 Q4 Q1 Q1 Q2 Q4 Q3
2019 Monthwise Consumption
Dates
2019
Q1
Q2
Q3
Q4
Usage
200K
100K
0K
101,306
87,276
99,834
103,151
101,728
96,776
118,600
105,274
102,347
102,443
93,289
104,183
January
Febru..
March
April
May
June
July
August
Septe..
October
Nove..
Decem..
Usage By Year
Dates
2019
2020
Usage
100K
50K
0K
101,306
87,276
118,600
101,728
102,347
102,443
93,289
85,319
77,012
78,242
53,559
15,661
17,131
18,134
18,537
18,281
February
April
June
August
October
December
2020 Monthwise Consumption
Dates
2020
Q1
Q2
Q3
Q4
Usage
150K
100K
50K
85,319
76,385
77,012
78,242
53,559
15,661
17,131
18,134
17,178
18,537
18,082
18,281
January
Februa..
March
April
May
June
July
August
Septe..
October
Novem..
Decem..
Quarter of Dates
Q1
Q2
Q3
Q4
Year of Dates
2019
2020
Month of Dates
January
February
March
April
May
June
July
August
September
October
November
December
Daseboard 2
Daseboard 4
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consum...
Type here to search
32°C Mostly clear
ENG
7:43 AM
4/10/2023

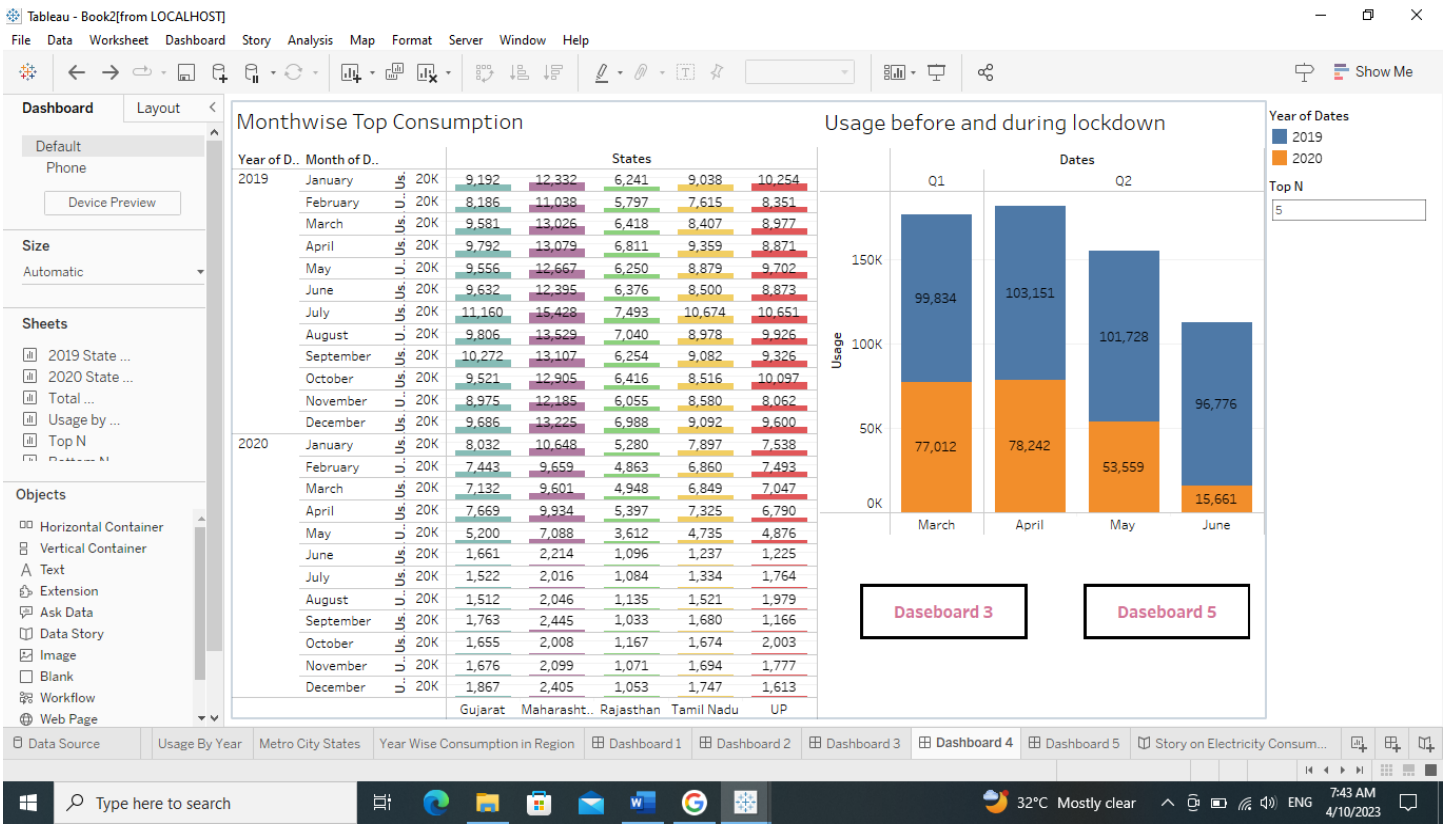


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Show Me
Dashboard Layout
Default
Phone
Device Preview
Size
Automatic
Sheets
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Objects
Horizontal Container
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page
Monthwise Top Consumption
Year of D.. Month of D..
States
2019 January 9,192 12,332 6,241 9,038 10,254
February 8,186 11,038 5,797 7,615 8,351
March 9,581 13,026 6,418 8,407 8,977
April 9,792 13,079 6,811 9,359 8,871
May 9,556 12,667 6,250 8,879 9,702
June 9,632 12,395 6,376 8,500 8,873
July 11,160 15,428 7,493 10,674 10,651
August 9,806 13,529 7,040 8,978 9,926
September 10,272 13,107 6,254 9,082 9,326
October 9,521 12,905 6,416 8,516 10,097
November 8,975 12,185 6,055 8,580 8,062
December 9,686 13,225 6,988 9,092 9,600
2020 January 8,032 10,648 5,280 7,897 7,538
February 7,443 9,659 4,863 6,860 7,493
March 7,132 9,601 4,948 6,849 7,047
April 7,669 9,934 5,397 7,325 6,790
May 5,200 7,088 3,612 4,735 4,876
June 1,661 2,214 1,096 1,237 1,225
July 1,522 2,016 1,084 1,334 1,764
August 1,512 2,046 1,135 1,521 1,979
September 1,763 2,445 1,033 1,680 1,166
October 1,655 2,008 1,167 1,674 2,003
November 1,676 2,099 1,071 1,694 1,777
December 1,867 2,405 1,053 1,747 1,613
Gujarat Maharasht.. Rajasthan Tamil Nadu UP
Usage before and during lockdown
Dates
Q1 Q2
Usage
150K 100K 50K 0K
99,834 77,012 103,151 78,242 101,728 53,559 96,776 15,661
March April May June
Daseboard 3
Daseboard 5
Year of Dates
2019
2020
Top N
5
Data Source Usage By Year Metro City States Year Wise Consumption in Region Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Dashboard 5 Story on Electricity Consum...
Type here to search
32°C Mostly clear
ENG
7:43 AM
4/10/2023

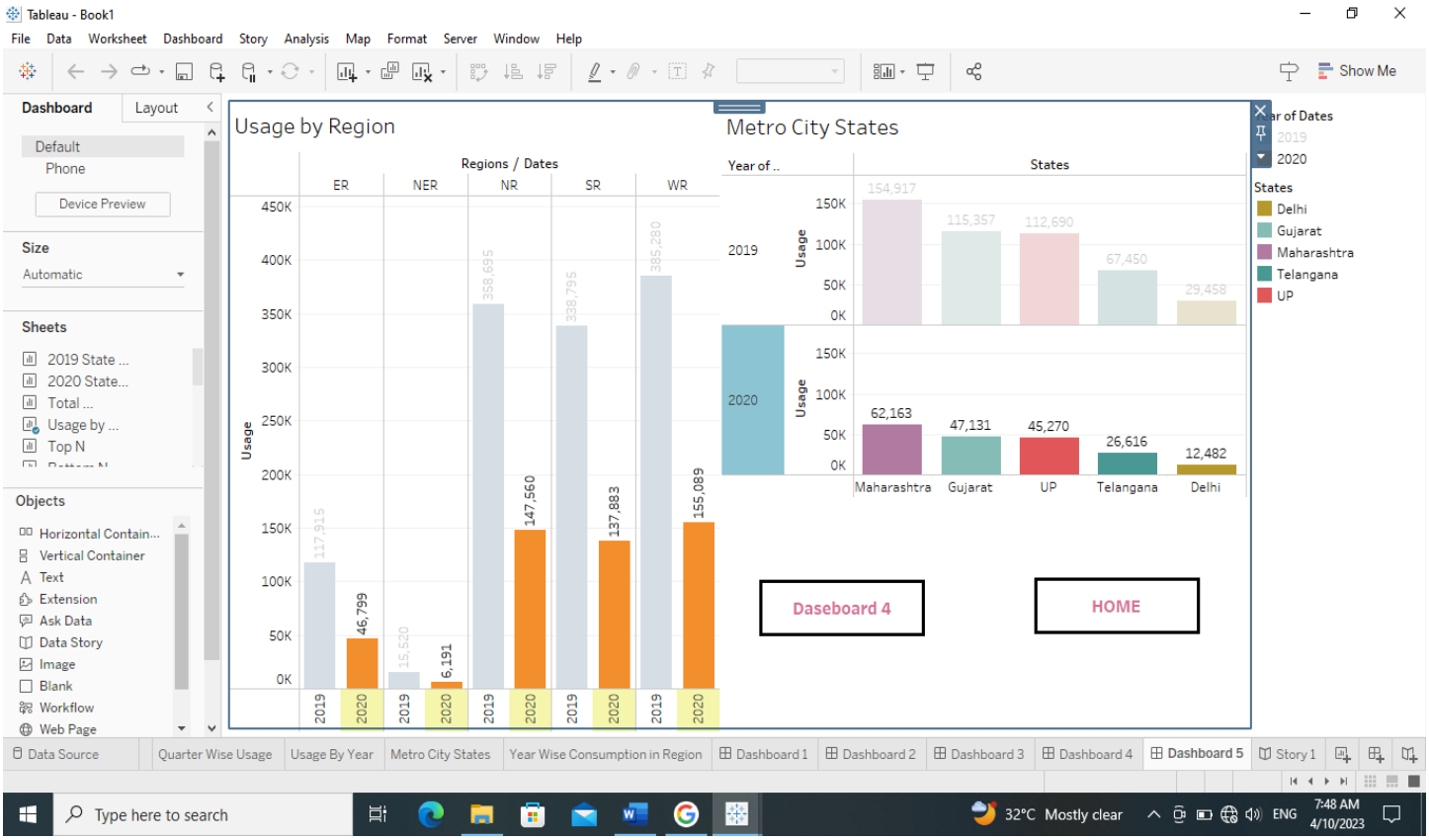
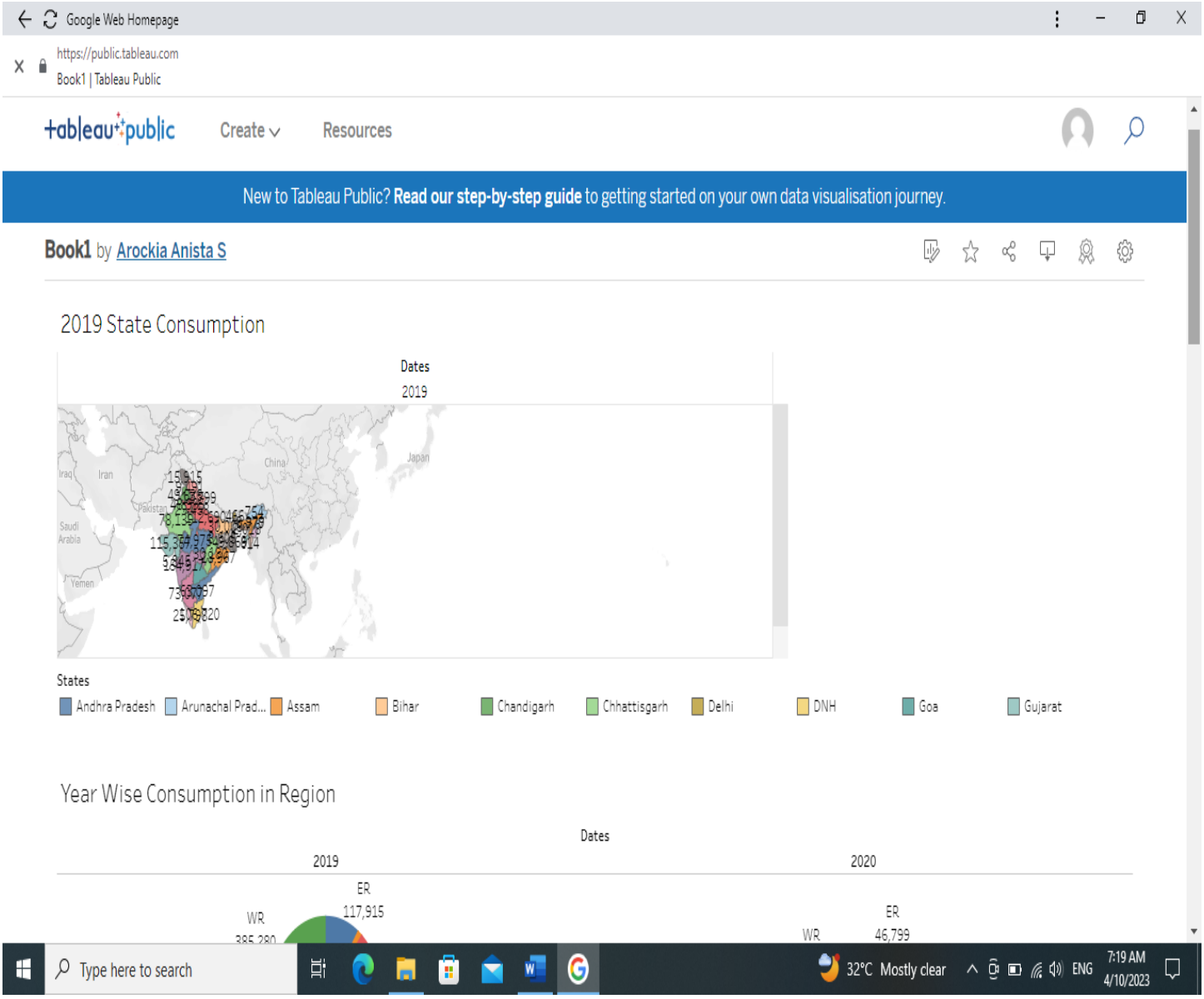
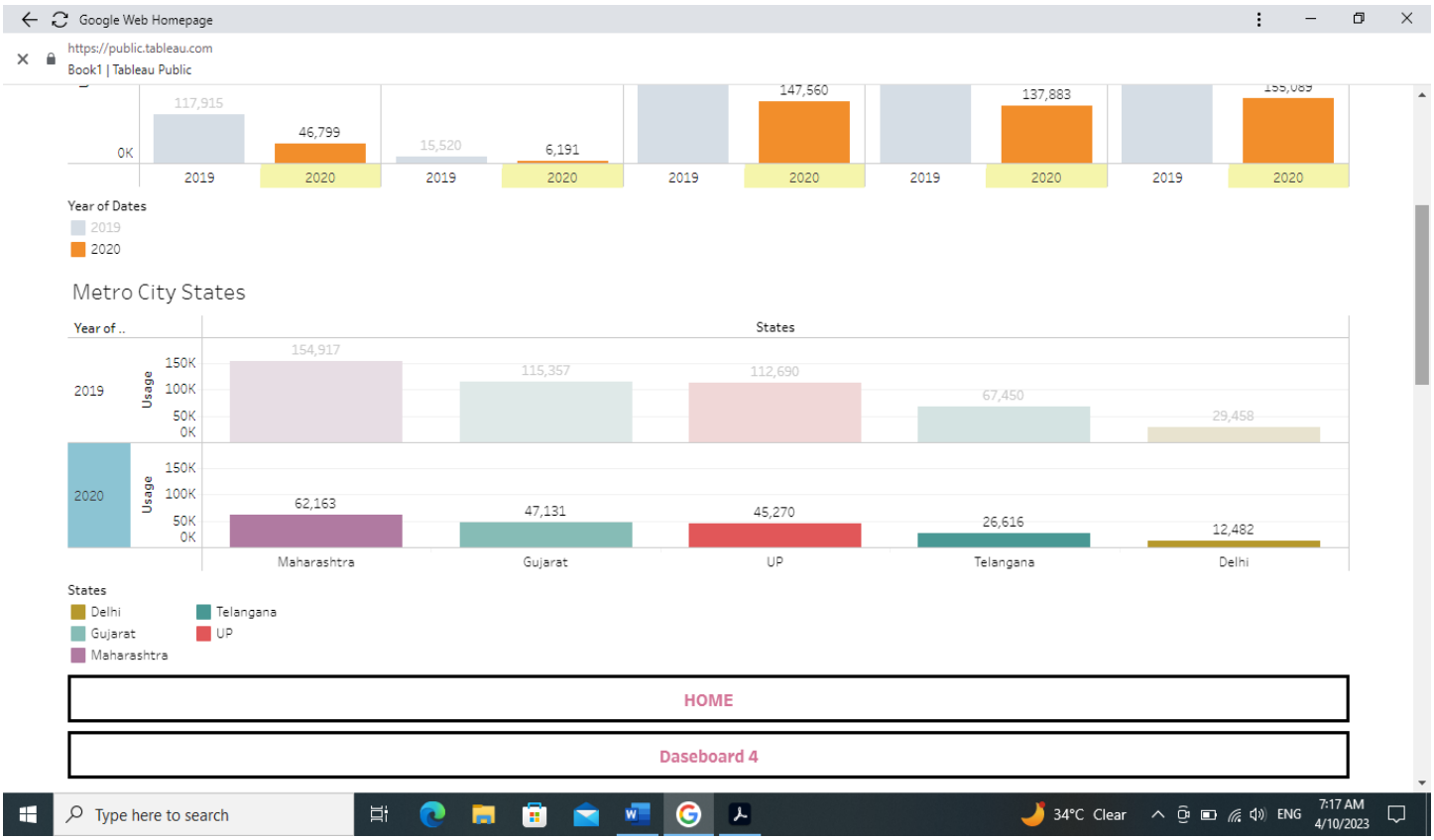


Tableau - Book1
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Show Me
Dashboard Layout
Default
Phone
Device Preview
Size
Automatic
Sheets
2019 State ...
2020 State...
Total ...
Usage by ...
Top N
Objects
Horizontal Contain...
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page
Usage by Region
Regions / Dates
ER NER NR SR WR
Usage
450K 400K 350K 300K 250K 200K 150K 100K 50K 0K
117,915 46,799 15,520 6,191 358,695 147,560 338,795 137,883 385,280 155,089
2019 2020 2019 2020 2019 2020 2019 2020 2019 2020
Metro City States
Year of ..
States
2019
2020
Usage
154,917 115,357 112,690 67,450 29,458
62,163 47,131 45,270 26,616 12,482
Maharashtra Gujarat UP Telangana Delhi
Daseboard 4
HOME
Year of Dates
2019
2020
States
Delhi
Gujarat
Maharashtra
Telangana
UP
Data Source Quarter Wise Usage Usage By Year Metro City States Year Wise Consumption in Region Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Dashboard 5 Story 1
Type here to search
32°C Mostly clear
ENG
7:48 AM
4/10/2023

Final Dashboard Output in tableau public:




Google Web Homepage
https://public.tableau.com
Book1 | Tableau Public
117,915
46,799
15,520
6,191
147,560
137,883
155,089
0K
2019
2020
Year of Dates
2019
2020
Metro City States
Year of ..
States
154,917
115,357
112,690
67,450
29,458
62,163
47,131
45,270
26,616
12,482
150K
100K
50K
0K
Usage
Maharashtra
Gujarat
UP
Telangana
Delhi
HOME
Daseboard 4
Type here to search
34°C Clear
ENG
7:17 AM
4/10/2023

Story:

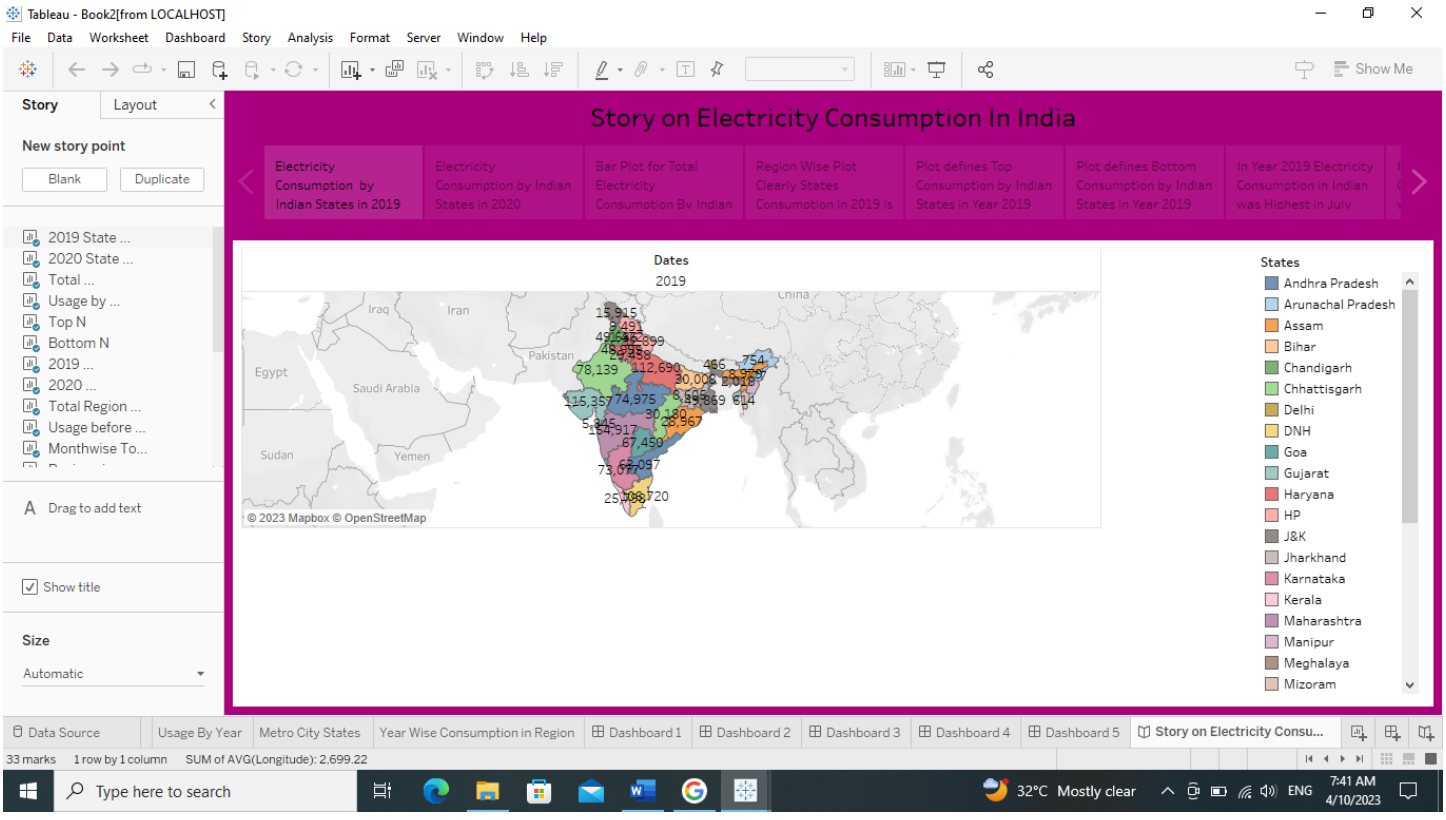


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Show Me
Story
Layout
New story point
Blank
Duplicate
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Bottom N
2019 ...
2020 ...
Total Region ...
Usage before ...
Monthwise To...
Drag to add text
Show title
Size
Automatic
Story on Electricity Consumption In India
Electricity Consumption by Indian States in 2019
Electricity Consumption by Indian States in 2020
Bar Plot for Total Electricity Consumption By Indian
Region Wise Plot Clearly States Consumption in 2019 is
Plot defines Top Consumption by Indian States in Year 2019
Plot defines Bottom Consumption by Indian States in Year 2019
In Year 2019 Electricity Consumption in Indian was Highest in July
Dates
2019
Iraq
Iran
China
Pakistan
Egypt
Saudi Arabia
Sudan
Yemen
© 2023 Mapbox © OpenStreetMap
States
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
DNH
Goa
Gujarat
Haryana
HP
J&K
Jharkhand
Karnataka
Kerala
Maharashtra
Manipur
Meghalaya
Mizoram
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consu...
33 marks
1 row by 1 column
SUM of AVG(Longitude): 2,699.22
Type here to search
32°C Mostly clear
ENG
7:41 AM
4/10/2023

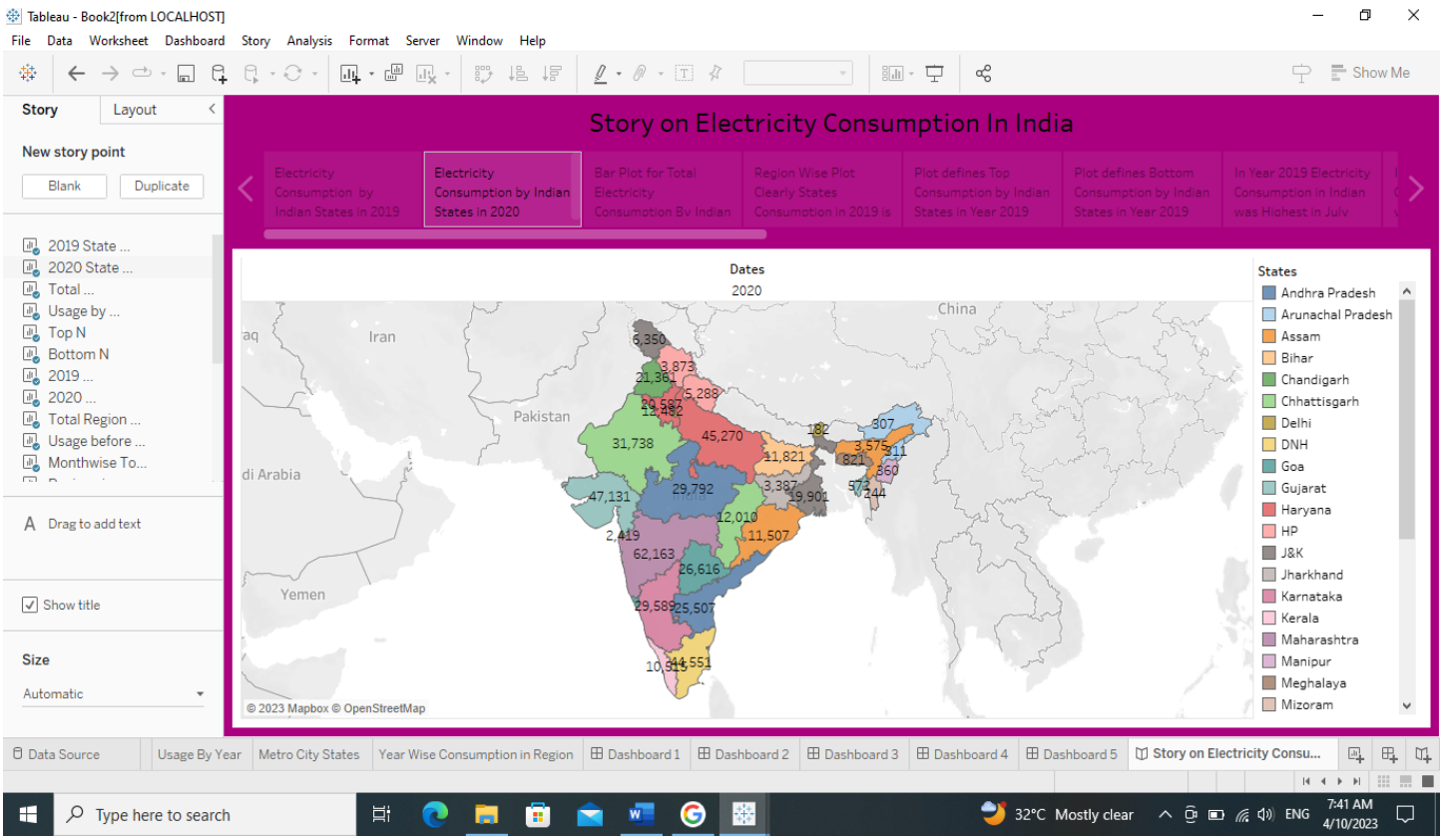


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Show Me
Story
Layout
New story point
Blank
Duplicate
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Bottom N
2019 ...
2020 ...
Total Region ...
Usage before ...
Monthwise To...
Drag to add text
Show title
Size
Automatic
Story on Electricity Consumption In India
Electricity Consumption by Indian States in 2019
Electricity Consumption by Indian States in 2020
Bar Plot for Total Electricity Consumption By Indian
Region Wise Plot Clearly States Consumption in 2019 is
Plot defines Top Consumption by Indian States in Year 2019
Plot defines Bottom Consumption by Indian States in Year 2019
In Year 2019 Electricity Consumption in Indian was Highest in July
Dates
2020
States
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
DNH
Goa
Gujarat
Haryana
HP
J&K
Jharkhand
Karnataka
Kerala
Maharashtra
Manipur
Meghalaya
Mizoram
China
Iran
Pakistan
Yemen
di Arabia
5,350
3,873
21,361
5,288
29,587
12,432
45,270
31,738
182
307
3,575
11,821
821
311
860
3,387
573
244
47,131
29,792
19,901
12,010
2,419
11,507
62,163
26,616
29,589
25,507
10,315
44,551
© 2023 Mapbox © OpenStreetMap
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consu...
Type here to search
32°C Mostly clear
ENG
7:41 AM
4/10/2023

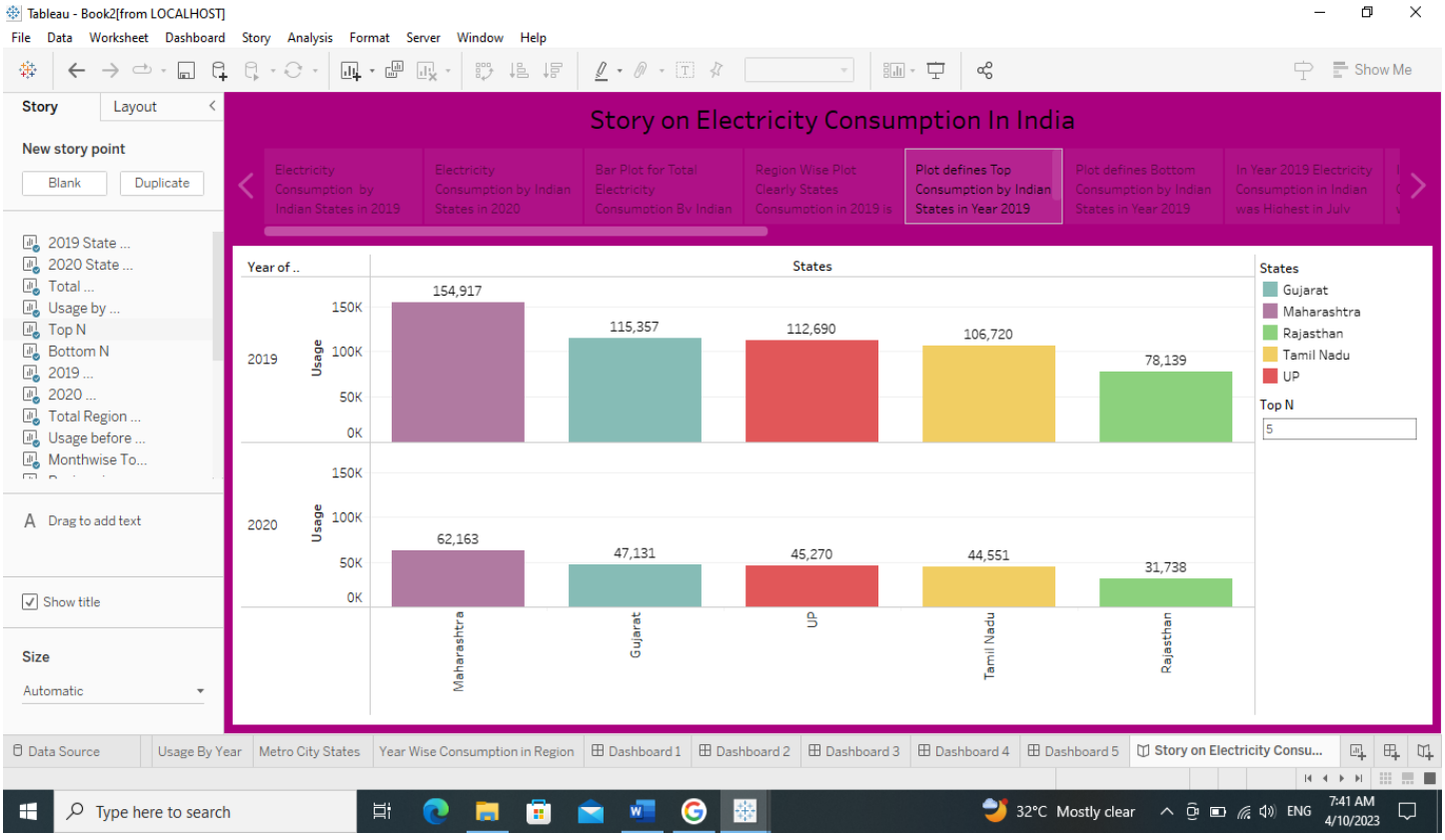


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Show Me
Story
Layout
New story point
Blank
Duplicate
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Bottom N
2019 ...
2020 ...
Total Region ...
Usage before ...
Monthwise To...
Drag to add text
Show title
Size
Automatic
Story on Electricity Consumption In India
Electricity Consumption by Indian States in 2019
Electricity Consumption by Indian States in 2020
Bar Plot for Total Electricity Consumption By Indian
Region Wise Plot Clearly States Consumption in 2019 is
Plot defines Top Consumption by Indian States in Year 2019
Plot defines Bottom Consumption by Indian States in Year 2019
In Year 2019 Electricity Consumption in Indian was Highest in July
Year of ..
States
2019
2020
Usage
150K
100K
50K
0K
154,917
115,357
112,690
106,720
78,139
62,163
47,131
45,270
44,551
31,738
Maharashtra
Gujarat
UP
Tamil Nadu
Rajasthan
States
Gujarat
Maharashtra
Rajasthan
Tamil Nadu
UP
Top N
5
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consu...
Type here to search
32°C Mostly clear
ENG
7:41 AM
4/10/2023

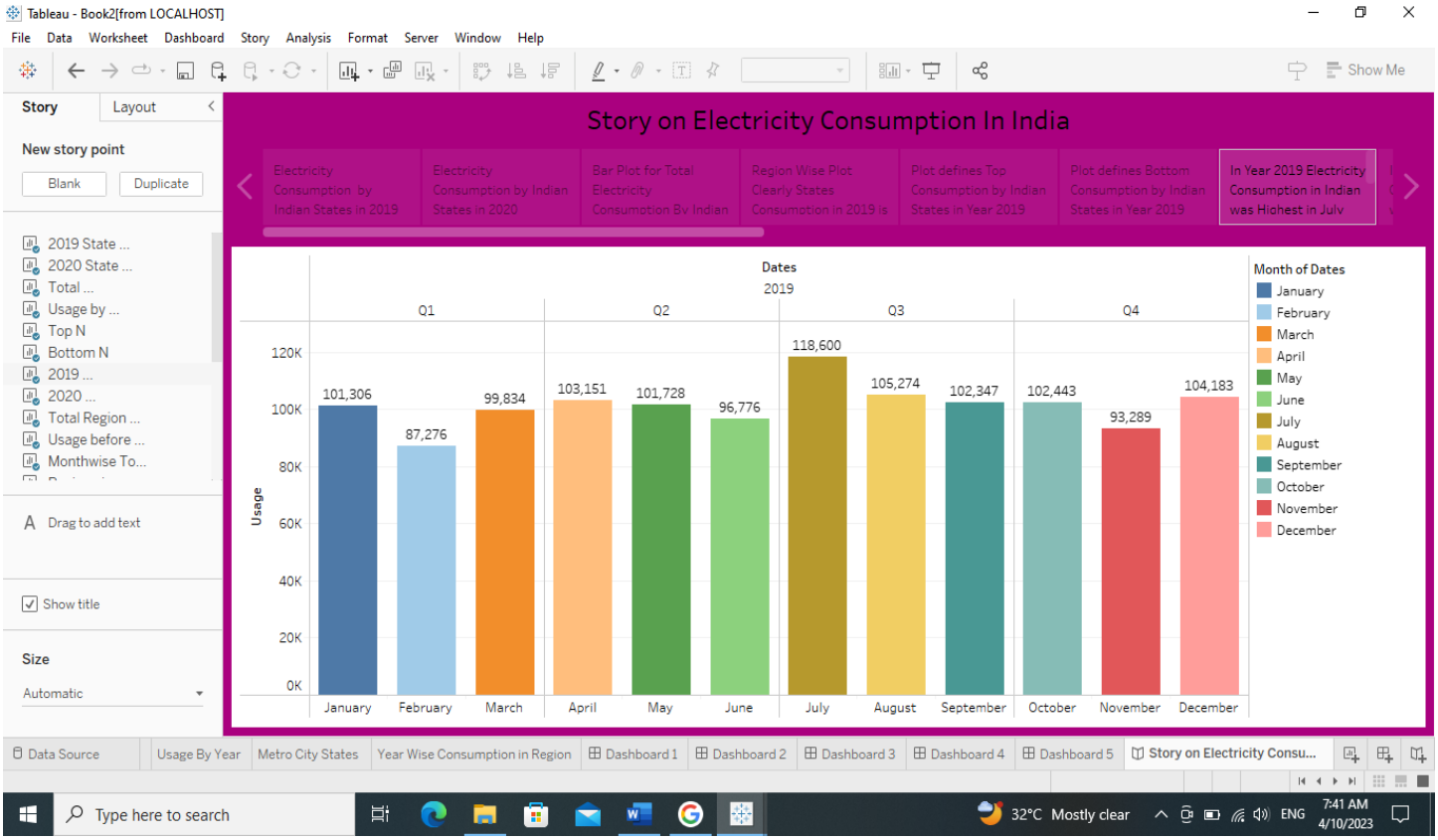


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Story
Layout
New story point
Blank
Duplicate
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Bottom N
2019 ...
2020 ...
Total Region ...
Usage before ...
Monthwise To...
Drag to add text
Show title
Size
Automatic
Story on Electricity Consumption In India
Electricity Consumption by Indian States in 2019
Electricity Consumption by Indian States in 2020
Bar Plot for Total Electricity Consumption By Indian
Region Wise Plot Clearly States Consumption in 2019 is
Plot defines Top Consumption by Indian States in Year 2019
Plot defines Bottom Consumption by Indian States in Year 2019
In Year 2019 Electricity Consumption in Indian was Highest in July
Dates
2019
Q1
Q2
Q3
Q4
Usage
120K
100K
80K
60K
40K
20K
0K
101,306
87,276
99,834
103,151
101,728
96,776
118,600
105,274
102,347
102,443
93,289
104,183
January
February
March
April
May
June
July
August
September
October
November
December
Month of Dates
January
February
March
April
May
June
July
August
September
October
November
December
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consu...
Type here to search
32°C Mostly clear
ENG
7:41 AM
4/10/2023

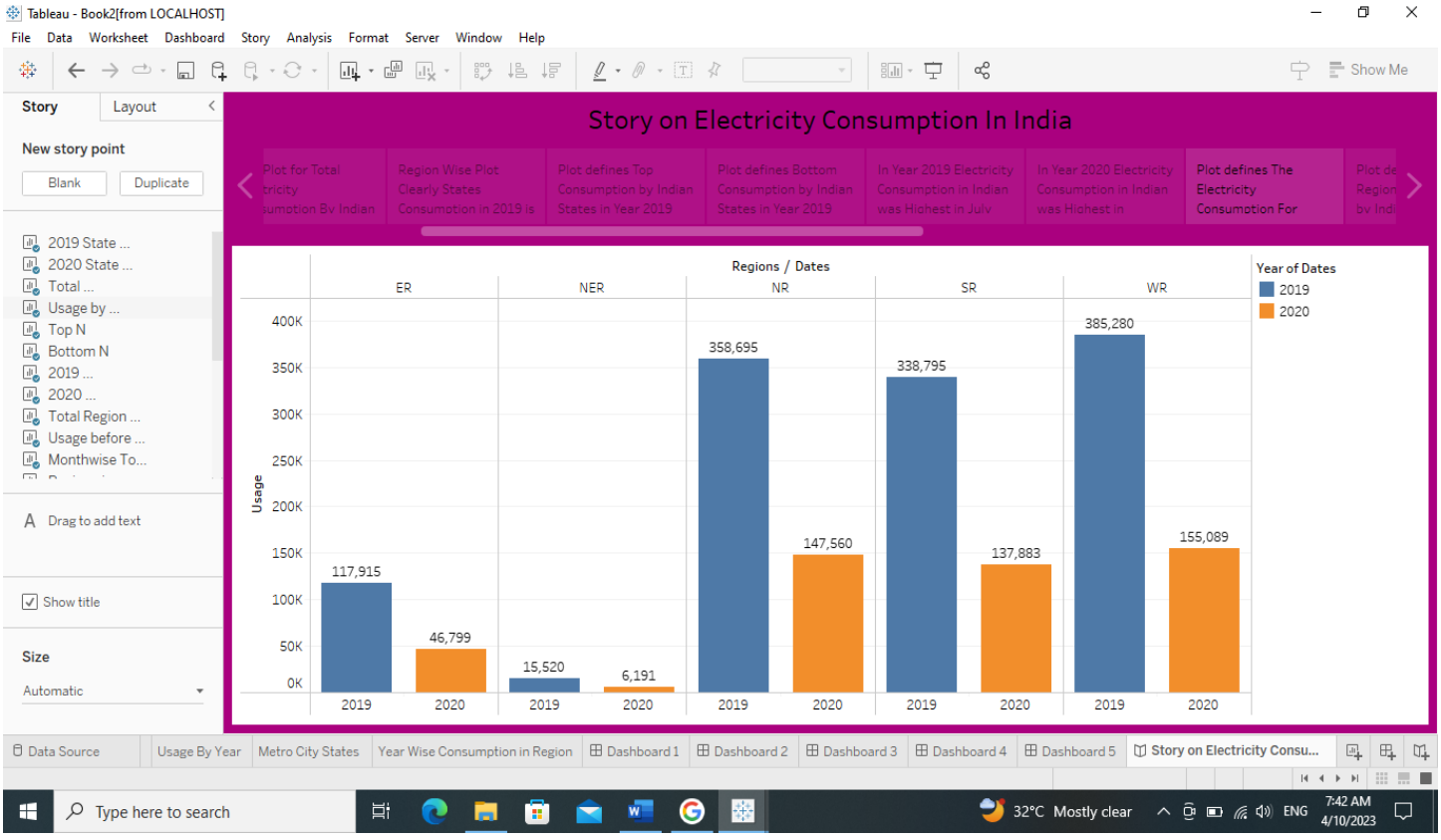
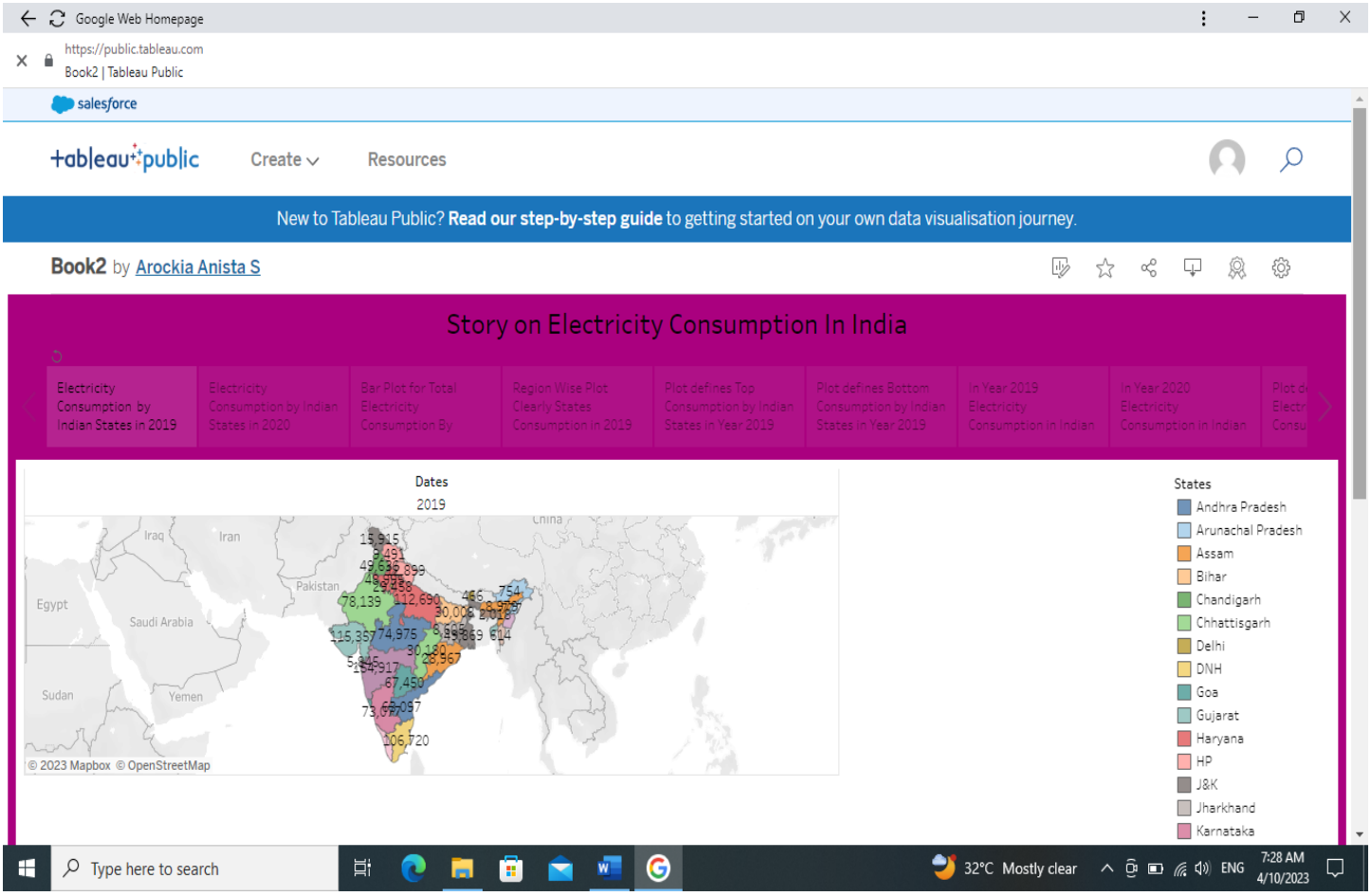


Tableau - Book2[from LOCALHOST]
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Story
Layout
New story point
Blank
Duplicate
2019 State ...
2020 State ...
Total ...
Usage by ...
Top N
Bottom N
2019 ...
2020 ...
Total Region ...
Usage before ...
Monthwise To...
Drag to add text
Show title
Size
Automatic
Story on Electricity Consumption In India
Plot for Total tricity sumption By Indian
Region Wise Plot Clearly States Consumption in 2019 is
Plot defines Top Consumption by Indian States in Year 2019
Plot defines Bottom Consumption by Indian States in Year 2019
In Year 2019 Electricity Consumption in Indian was Highest in July
In Year 2020 Electricity Consumption in Indian was Highest in
Plot defines The Electricity Consumption For
Regions / Dates
ER
NER
NR
SR
WR
Usage
400K
350K
300K
250K
200K
150K
100K
50K
0K
117,915
46,799
15,520
6,191
358,695
147,560
338,795
137,883
385,280
155,089
2019
2020
Year of Dates
2019
2020
Data Source
Usage By Year
Metro City States
Year Wise Consumption in Region
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Dashboard 5
Story on Electricity Consu...
Type here to search
32°C Mostly clear
ENG
7:42 AM
4/10/2023

Final Story Output in tableau public:



4.ADVANTAGES AND DISADVANTAGES

We all know that electricity is a set of physical phenomena associated with the presence and motion of electric charge.

Advantages:

- It is a clean, safe, cheap and convenient source of energy
- More efficient
- We all know that it can be set up in many sizes
- Reduces greenhouse emission
- Relatively low maintenance cost

- It is renewable
- Makes barely any pollution compare to other ways of creating or generating electricity

Disadvantages:

- More expensive than gasoline
- Sometimes messes up wildlife
- More power plants and more pollution
- Hydroelectric natural seasonal changes in river and ecosystems can be destroyed
- Drought can affect power production
- Cost for construction

5.APPLICATIONS

This project use to find the electricity consumption in India. It is used to compare the electricity consumption in other states. This project has to help the good understanding for the given data into the visualization method. Data analytics is very useful to this project. This project gives which states are highest electricity consumption and lowest electricity consumption. Date analytics is used for every field to find the required solution.

This project is useful in future for how to implement in electricity sources and how to improve lowest electricity consumption areas with low cost.

6.CONCLUSION

- Maharashtra is the Highest Electricity Consumption user of India.
- Gujarat is the Second Highest Electricity Consumption user of India.
- Sikkim is the Lowest Electricity Consumption user of India.
- Total Electricity Consumption in Western Region is Highest.
- Total Electricity Consumption in North Eastern Region is Lowest.

7.FUTURE SCOPE

- To create the Electricity Consumption APP for find the sources of electricity to that place

- Which states are the lowest electricity consumption. It is help to resolve the power supply
- To improve the sources of electricity

8.APPENDIX

Source Code:

Nil