UNEARTHING THE ENVIRONMENTAL IMPACT OF HUMAN ACTIVITY: A GLOBAL CO2 EMISSION ANALYSIS

1. INTRODUCTION:

1.1 OVERVIEW:

- Carbon dioxide is the main greenhouse gas. Carbon emissions are dangerous in that they threaten the livelihood our planet, animal, humans, and ultimately, life as we know it. The amount of carbon emissions trapped in our atmosphere causes global warming, which causes climate change, symptoms of which include melting of the polar ice caps, the rising of sea levels, the disturbance of animals' natural habitats, extreme weather events, and so many more negative side effects that are dangerous to the planet, to human and animal life, and to our future.
- Carbon dioxide emissions are the primary driver of global climate change. It's widely recognised that to avoid the worst impacts of climate change, the world needs to urgently reduce emissions.
- The increase in global CO2 emissions of over 2 billion tonnes was the largest in history in absolute terms, more than offsetting the previous year's pandemic-induced decline, the IEA analysis shows. The recovery of energy demand in 2021 was compounded by adverse weather and energy market conditions – notably the spikes in natural gas prices – which led to more coal being burned despite renewable power generation registering its largest ever growth.
- Coal accounted for over 40% of the overall growth in global CO2 emissions in 2021, reaching an all-time high of 15.3 billion tonnes. CO2 emissions from natural gas rebounded well above their 2019 levels to 7.5 billion tonnes. At 10.7 billion tonnes, CO2 emissions from oil remained significantly below pre-pandemic levels because of the limited recovery in global transport activity in 2021, mainly in the aviation sector.

1.2 PURPOSE:

- Carbon emission analysis is a part of greenhouse gas monitoring refers to tracking how much carbon dioxide or methane is produced by a particular activity at a particular time.
- Taking actions to reduce greenhouse gas emissions yields important economic benefits.
- These benefits are from the reduced risk to human health and welfare that results from lower emissions of greenhouse gases and less global warming and climate change.
- Provides information on the efficiency and effectiveness of processes used by local authorities in exercising powers or performing their functions and duties.
- By analyzing the total carbon emission, we can reduce the carbon emission in our country, house, workplace, etc.

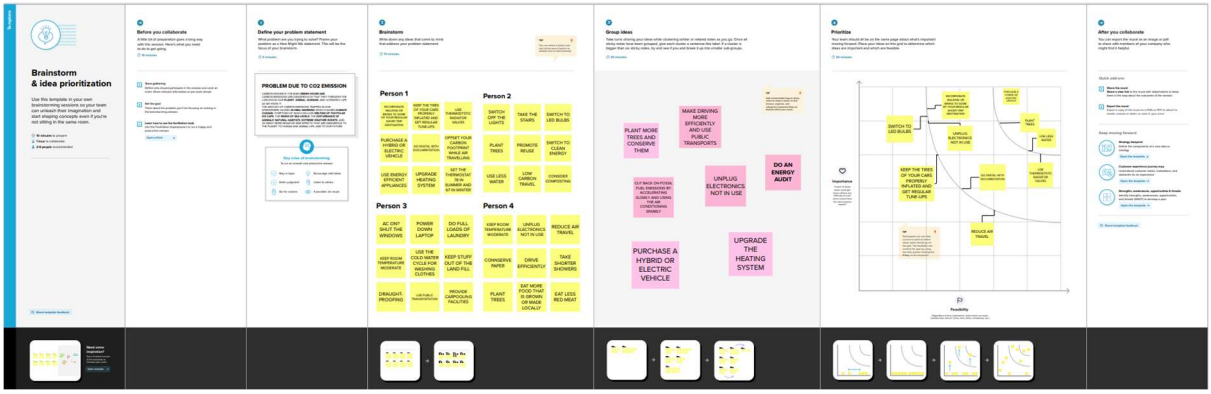
2. PROBLEM DEFINITION AND DESIGN THINKING:

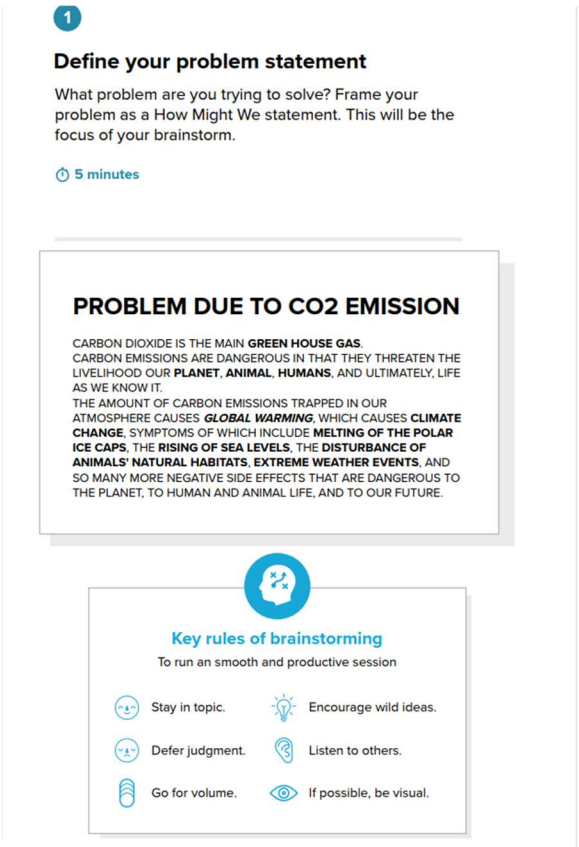
2.1 EMPATHY MAP:

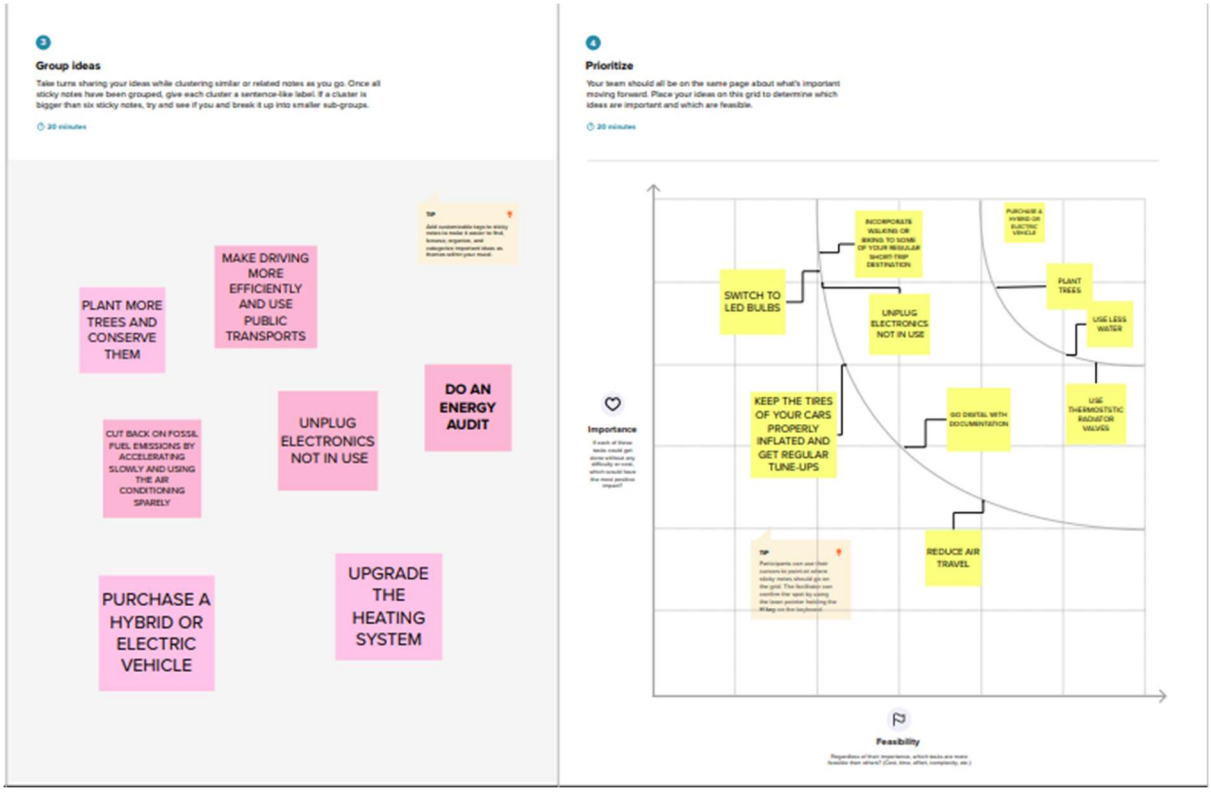
An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. The four quadrants refer to what the user: **Said, Did, Thought, and Felt**. Here, we made the Empathy map by analyzing and questioning the common people for our project. And we made their response as this kind of map.

2.2 IDEATION AND BRAINSTROMING:

Brainstorming is the most frequently practiced form of ideation. The intention of brainstorming is to leverage the collective thinking of the group, by engaging with each other, listening, and building on other ideas. Here, we people sat together and put our ideas and group it and also prioritize it in graph. This process shows our idea towards this project.



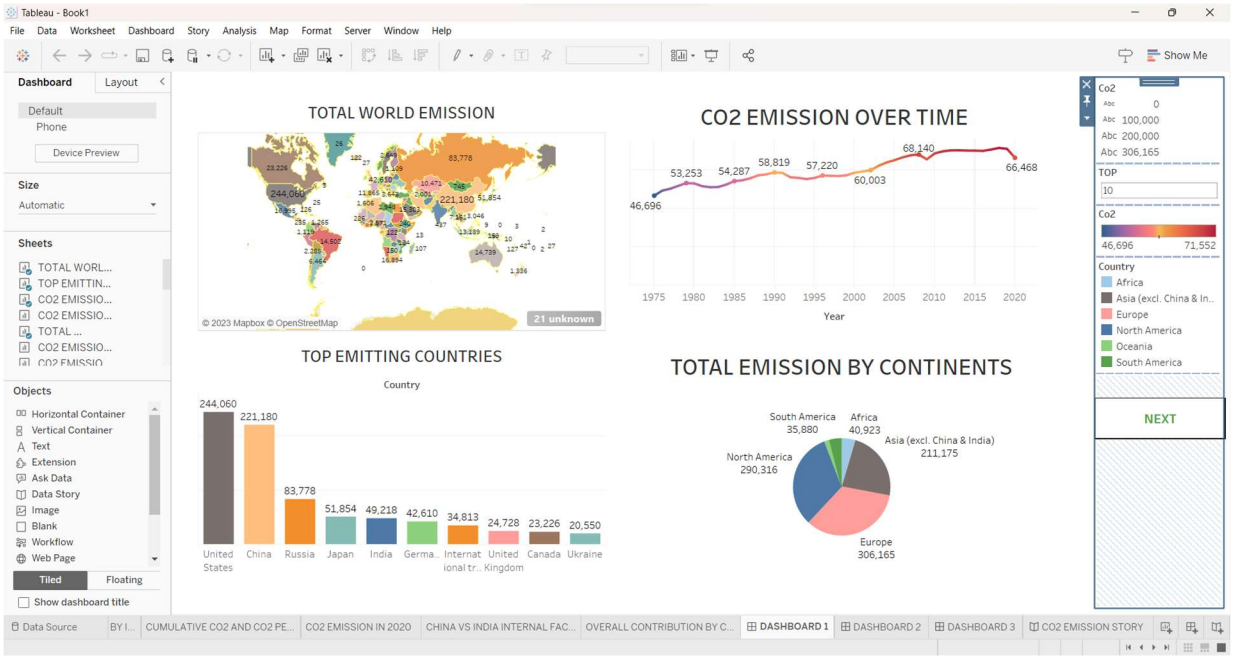


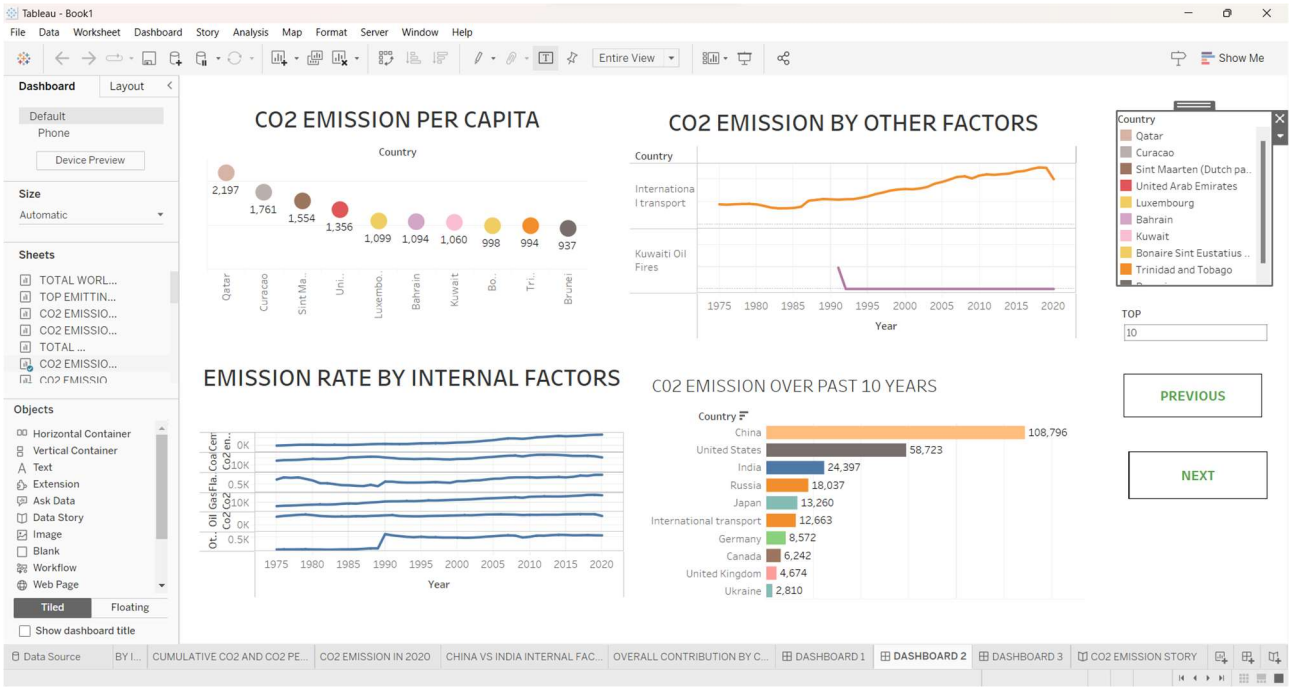


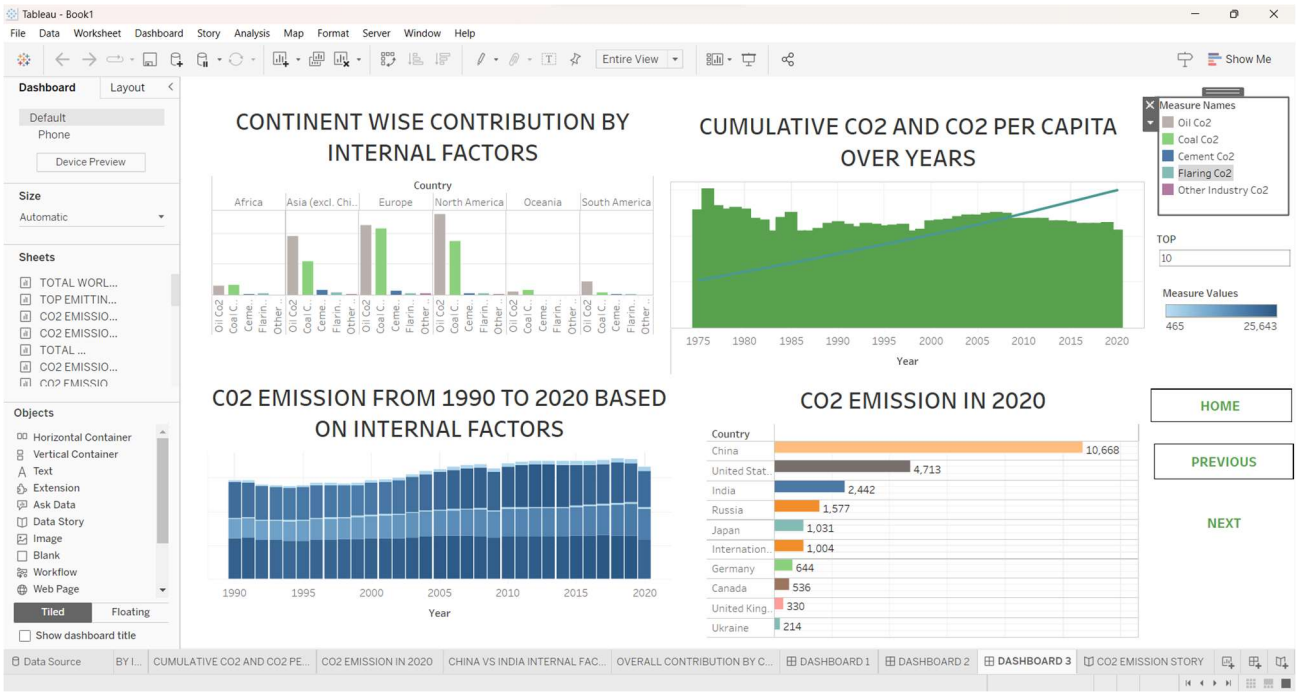
3. RESULT:

Here, we attach the final outputs of our project such as DASHBOARD, STORY and WEB INTEGRATION as screenshot.

3.1 DASHBOARD:

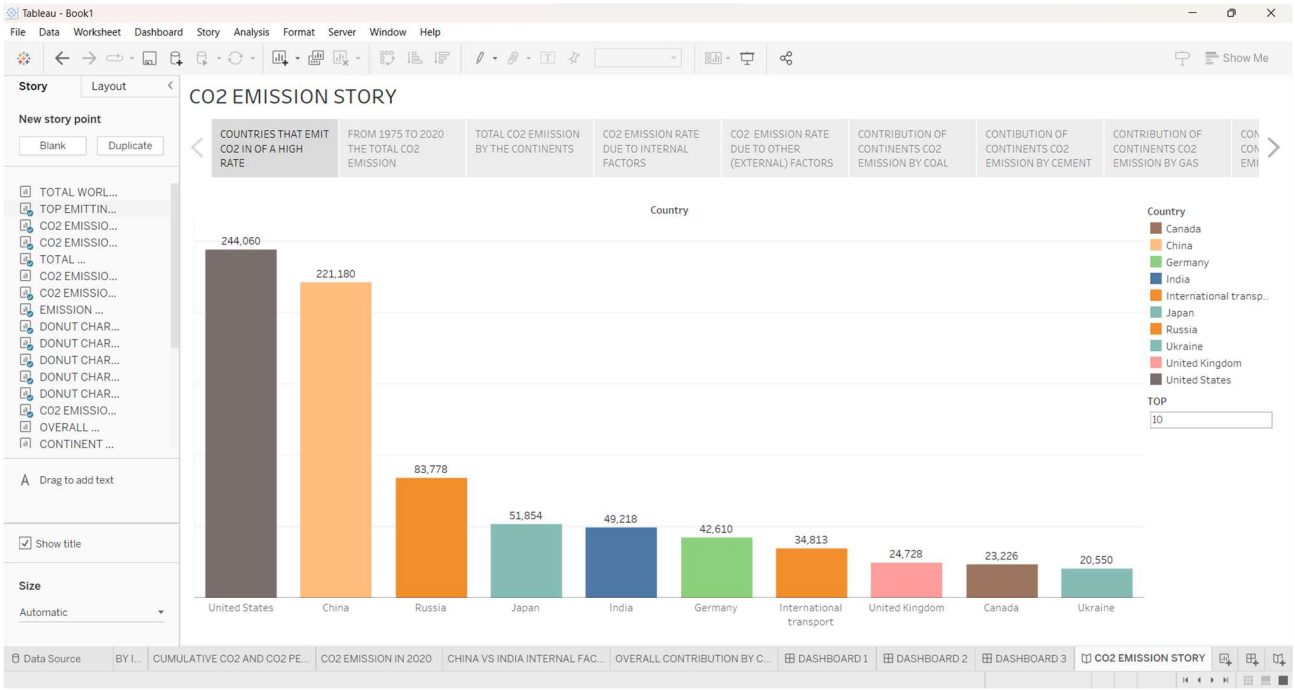






The main use of a dashboard is to show a comprehensive overview of data from different sources. Dashboards are useful for monitoring, measuring, and analyzing relevant data in key areas. Here, we use the dashboard for the overall analysis and comparison of carbon emission in different countries.

3.2 STORY:



In Tableau, a story is a sequence of visualizations that work together to convey information. Here, is the story of our project C02 emission analysis.

3.3 WEB INTEGRATION:

Web data integration (WDI) is the process of aggregating and managing data from different websites into a single, homogeneous workflow. This process includes data access, transformation, mapping, quality assurance and fusion of data. Data that is sourced and structured from websites is referred to as "web data". We done web integration by html coding. Here, is our final output after web integration.

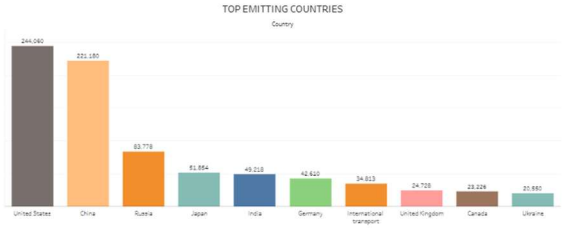
ABOUT US

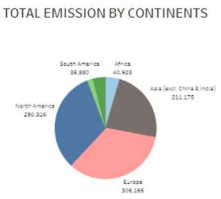
Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

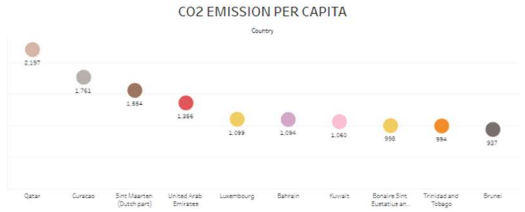
Global carbon dioxide (CO2) emissions from fossil fuels and industry have increased considerably since 2000, and in 2019 reached a record high of 36.7 billion metric tons of CO2. In 2020, the COVID-19 pandemic caused global CO2 emissions to plummet five percent to 34.81 billion metric tons.

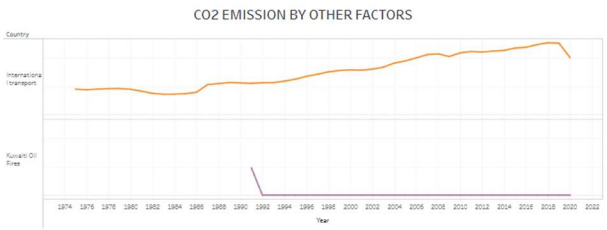
Historically, major global events cause emission reductions. The 2009 global recession caused worldwide CO2 emissions to fall by approximately 460 million metric tons. But this pales in comparison to the emission reductions in 2020. Countries around the world were put under strict lockdowns, meaning transportation and industrial activities were significantly reduced. CO2 emission levels in India dropped for the first time in four decades in the year ending March 2020. Global CO2 emissions per capita also experienced a substantial decline in 2020, falling to an average of 4.47 metric tons per person.

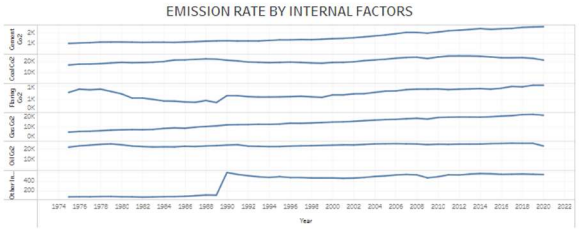
DASHBOARD

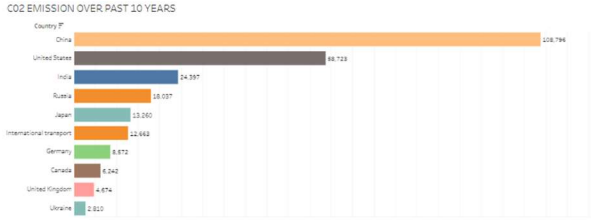




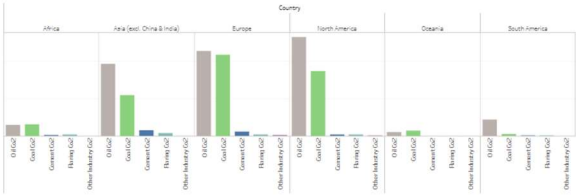




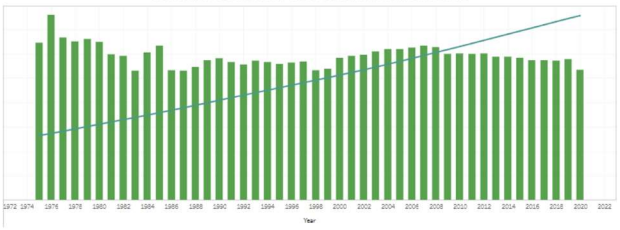




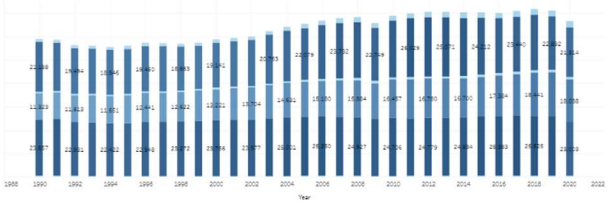
CONTINENT WISE CONTRIBUTION BY INTERNAL FACTORS



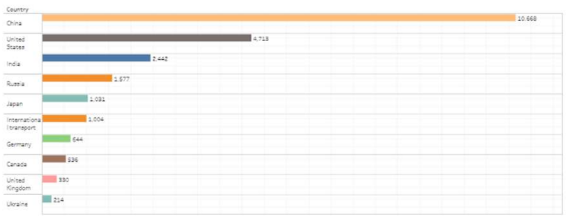
CUMULATIVE CO2 AND CO2 PER CAPITA OVER YEARS



CO2 EMISSION FROM 1990 TO 2020 BASED ON INTERNAL FACTORS

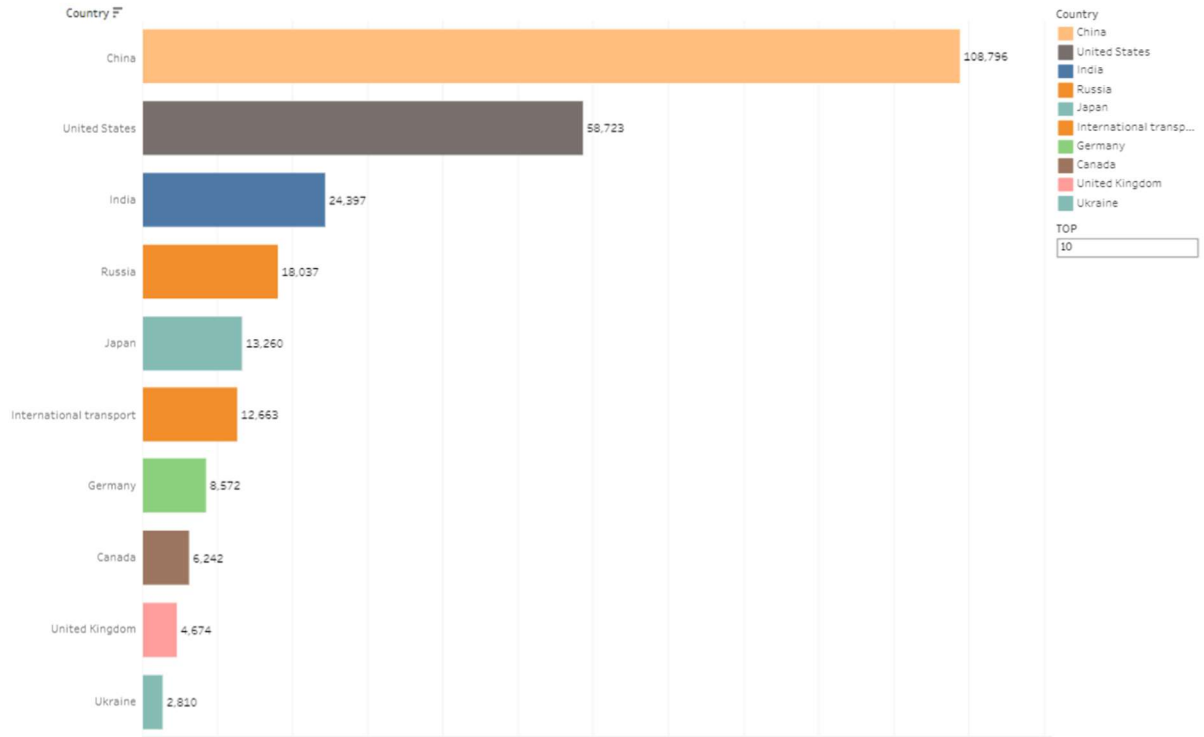


CO2 EMISSION IN 2020

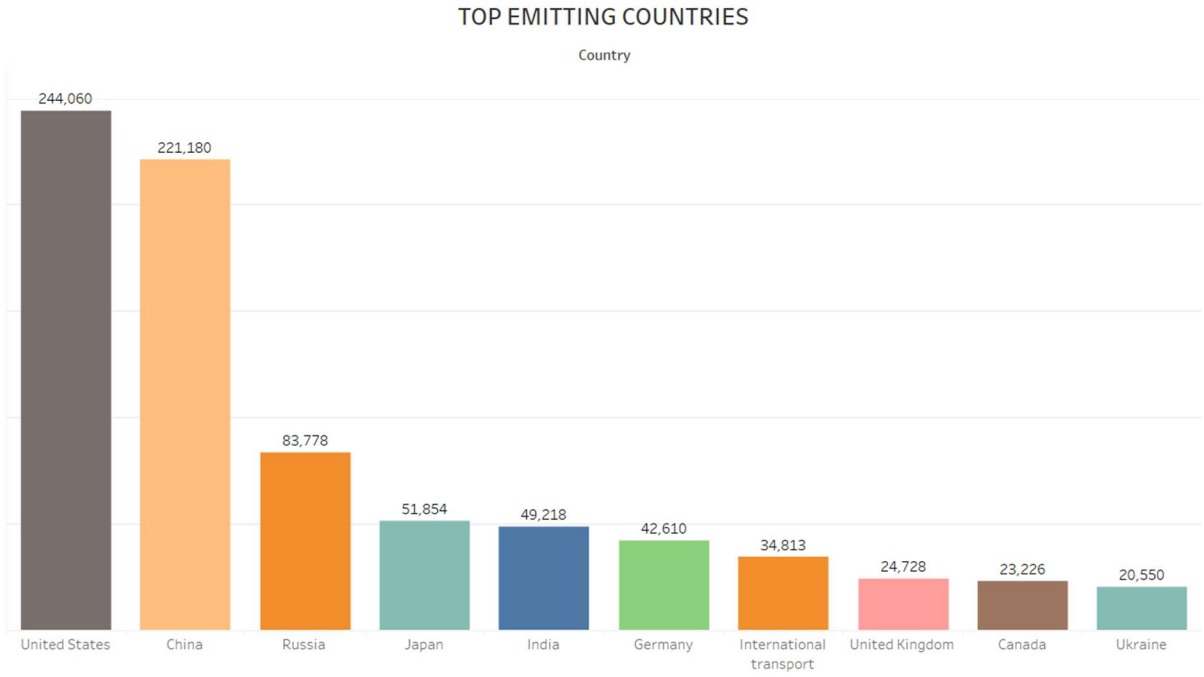


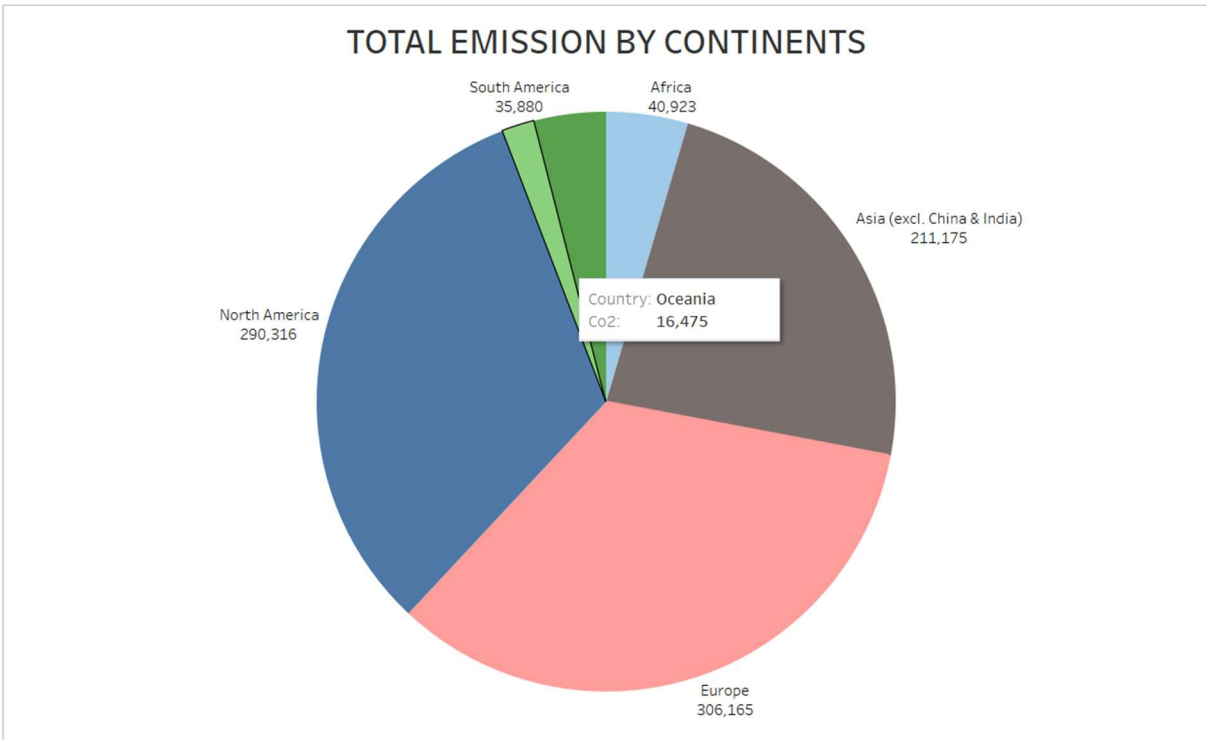
CO2 EMISSION STORY

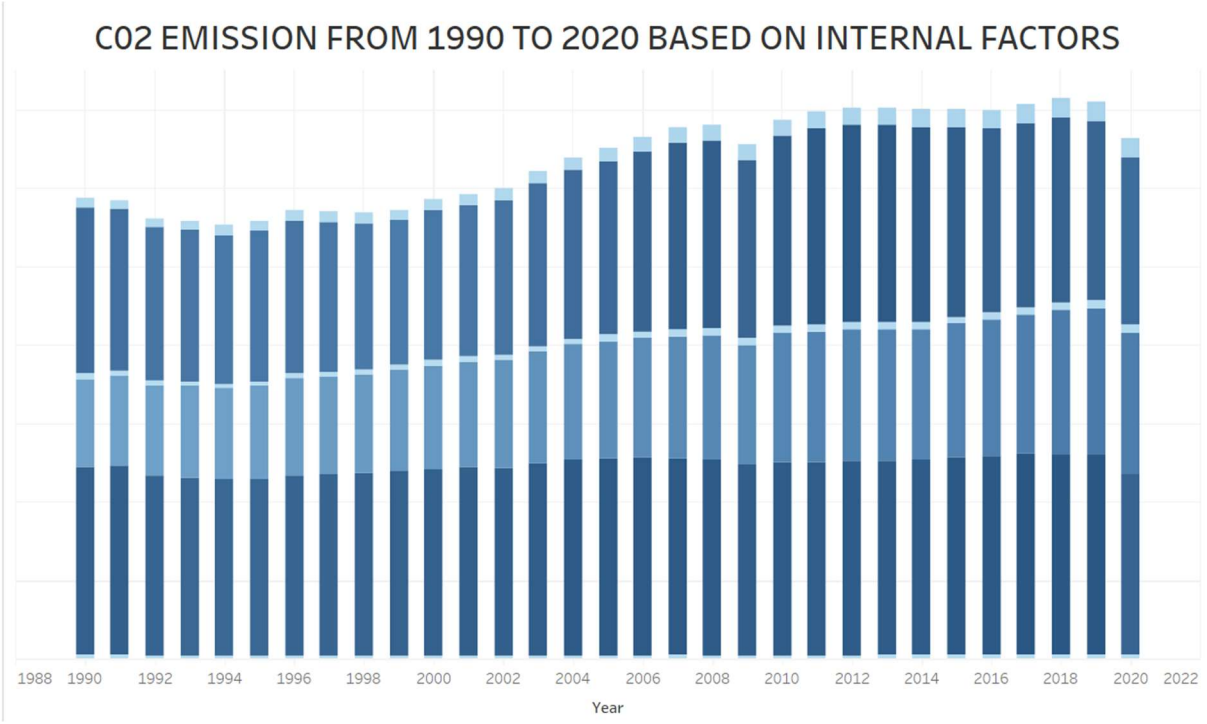
MISSION RATE D INTERNAL IRS | CO2 EMISSION RATE DUE TO OTHER (EXTERNAL) FACTORS | CONTRIBUTION OF CONTINENTS CO2 EMISSION BY COAL | CONTIBUTION OB CONTINENTS CO2 EMISSION BY CEMENT | CONTRIBUTION OF CONTINENTS CO2 EMISSION BY GAS | CONTRIBUTION OF CONTINENTS CO2 EMISSION BY FLARING | CONTRIBUTION OF CONTINENTS CO2 EMISSION BY OIL | **CO2 EMISSION FOR PAST 10 YEARS** | EMISS INDIA STATES

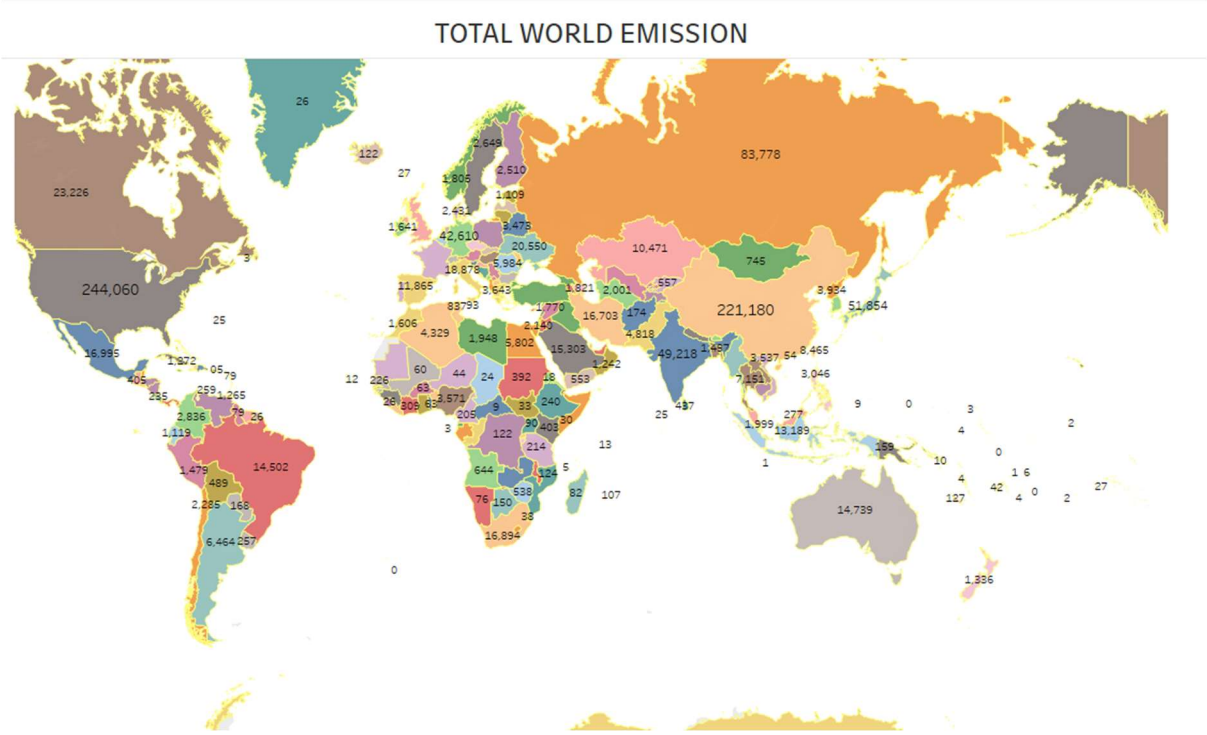


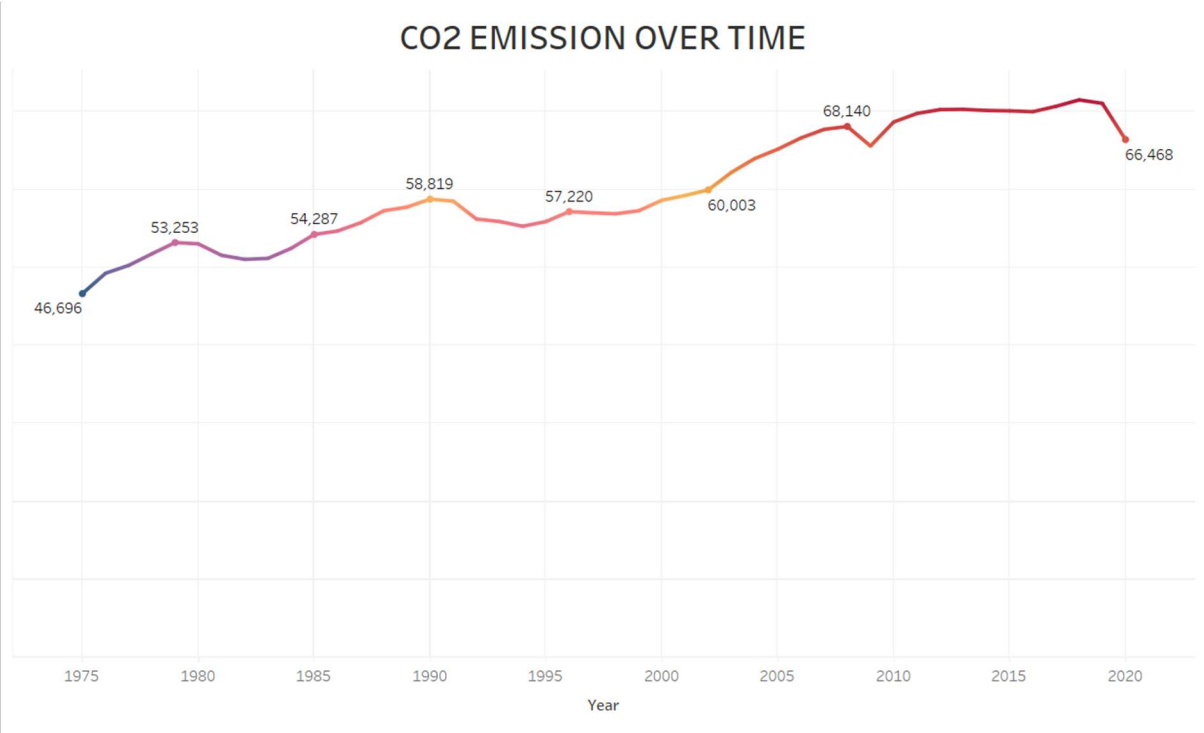
VISUALIZATIONS

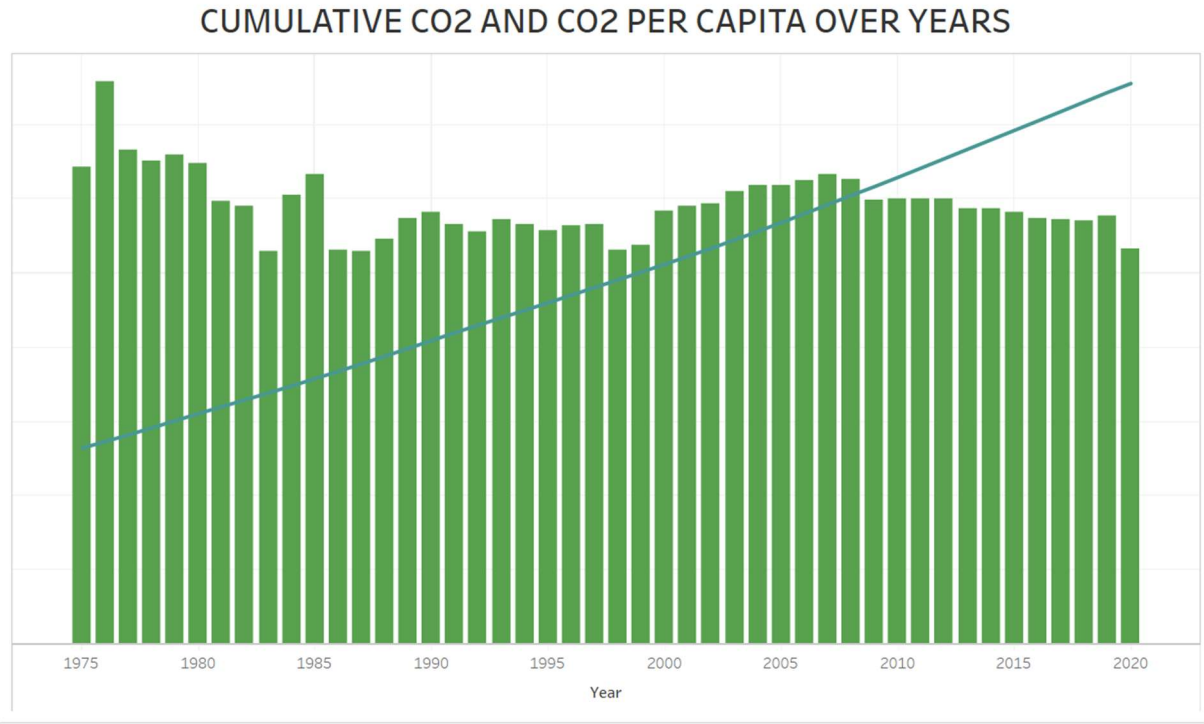





C02 EMISSION FROM 1990 TO 2020 BASED ON INTERNAL FACTORS
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year


TOTAL WORLD EMISSION
83,778
23,226
244,060
221,180
51,854
49,218
42,610
14,502
14,739


CO2 EMISSION OVER TIME
46,696
53,253
54,287
58,819
57,220
60,003
68,140
66,468
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

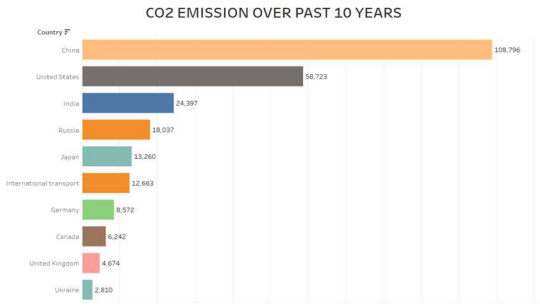

CUMULATIVE CO2 AND CO2 PER CAPITA OVER YEARS
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

Top Co2 Emitting countries for Past 10 Years

China is the highest Co2 Emitting country among the other countries.

United States is the second highest Co2 Emitting country.

India is the Third highest Co2 Emitting country.

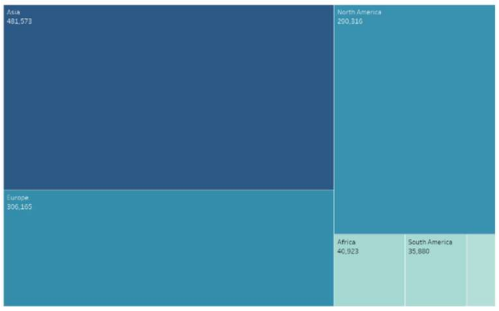


Continents Contribution towards Co2 Emission

Asian is the highest Co2 Emitting country among the other continents.

Europe is the second highest Co2 Emitting continent.

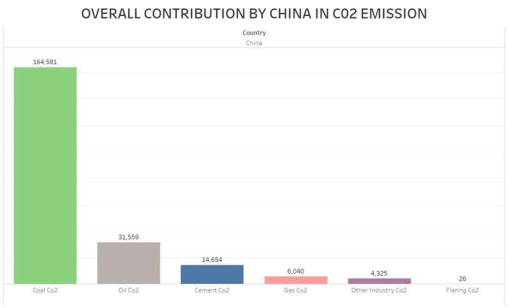
Antartica is the lowest Co2 Emitting countries because of low human activity/existence in the continent.



Overall India Contribution towards Co2 Emission

Coal is the highest factor of Co2 Emission.

Oil is the second highest Co2 Emitting factor.

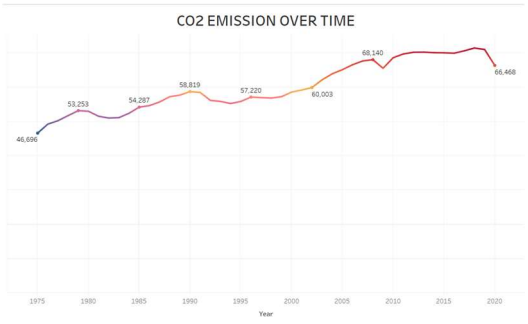


Overall Co2 Emission over time

Co2 Emission in 1975 was 67324 (in metric tons).

Co2 Emission in 2019 was 128423 (in metric tons) which was highest in the past years.

Co2 Emission in 2020 was found to be 121593 (in metric tons).



4. ADVANTAGES AND DISADVANTAGES:

4.1 ADVANTAGES:

- Make fact-based business decisions more quickly and with greater knowledge.
- Identify performance problems that need to be fixed.
- Gain a deeper comprehension to decrease CO2 Emission.
- To take preventative action, raise risk awareness.
- Visualize the data's various dimensions.
- Obtain a competitive edge.
- Find strategies to lower CO2 emission and boost alternating steps.

4.2 DISADVANTAGES:

- Data collection takes lot of time.
- Statements understood without context can often lead to incorrect conclusions.
- In some cases, researchers do not go through the hassle of using a large amount of data.
- Sometimes, we may get false data.
- It’s difficult for us to get the data correctly.

5. APPLICATIONS:

It is applicable in many areas like:

- House
- Schools and Colleges
- Offices
- Workplaces
- Factories
- Hospitals

5.1 PURPOSE:

- Saving our environment.
- To reduce CO2 emission.
- To teach students not to waste non-renewable sources.
- To do an energy audit.
- To gain better understanding about it.

6. CONCLUSION:

In this project, we downloaded MySQL and put our data format as csv file type. Then, we downloaded Tableau for making visualizations, dashboards and story. Then, to connect Tableau with MySQL we downloaded ODBC Connector Server and insert the data of MySQL in Tableau. Firstly, we created the visualization and then dashboard and story by dragging the visualizations. After completing these processes, we publish the visualizations, dashboard and story in Tableau Public and viewed it. For the next level we made web integration by using Bootstrap made and coded html language for that. In this, we get to know about how to analyze data, how to create maps, bar charts, and also filters.

Here, we gave solutions to the global CO2 emission. If we follow these means we will conserve our planet, Earth and can stop global warming.

There are many simple solutions such go by-walk to nearer places and use public transport more-over, plant more trees, avoid plastics, follow the 3R's Reduce, Reuse, Recycle and unplug the electronic gadgets when not in use.

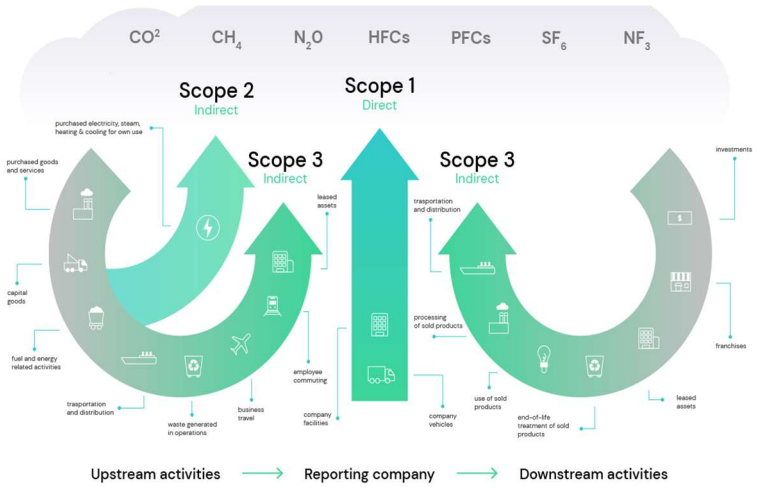
7. FUTURE SCOPE:

The energy sourced from fossil fuels is non-sustainable, and yet it accounts for a large percentage of the energy used in the construction and operation processes. The strategies to reduce CO_2 in the building sector are enforcing standards and policy, conducting impact assessment, adopting low carbon technology, and restricting energy utilization. If we continue with the current approach for the building sector, it will be too late to rectify the mistakes of our predecessors. The future of sustainable cities and communities will remain uncertain, and we might fail to achieve global sustainable development goals. The building sector must be given enough attention and care to reduce the rate of CO_2 emissions. A comprehensive and thorough analysis is necessary to study the CO_2 emission mitigation measures in the building sector, and global organizations must come up with a holistic framework to tackle the issue. For a more sustainable future, it is crucial to implement drastic actions and measures to reduce CO_2 emissions to aid the fight in combating climate change.

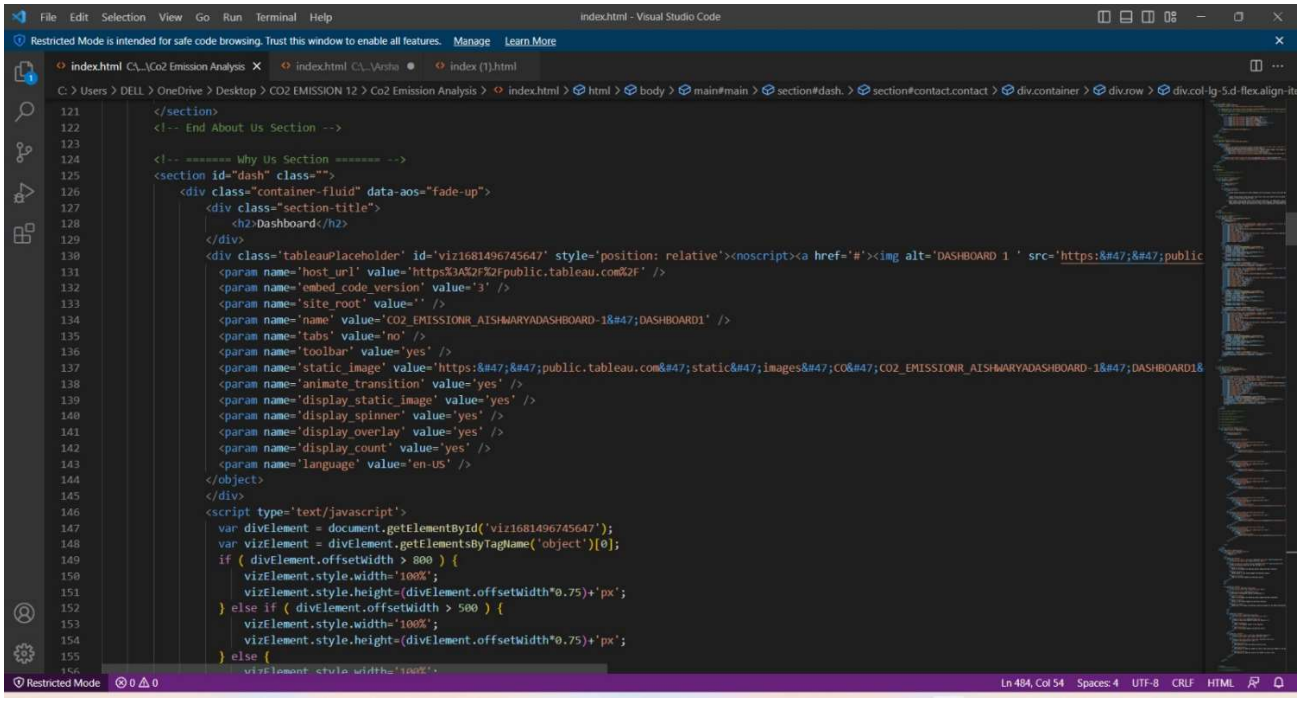
Carbon management is a growing field for addressing the contribution businesses have to climate change and reducing greenhouse gas emissions.

The approach is helpful for environmental management, because it applies a practical lens to an often-challenging problem of global warming.

Finding the most straightforward, effective strategies for businesses reducing emissions requires measurement, accuracy, a combination of technological and soft skills, and a commitment to becoming part of the solution to climate change.



8. APPENDIX: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<!-- ======= Why Us Section ======= -->
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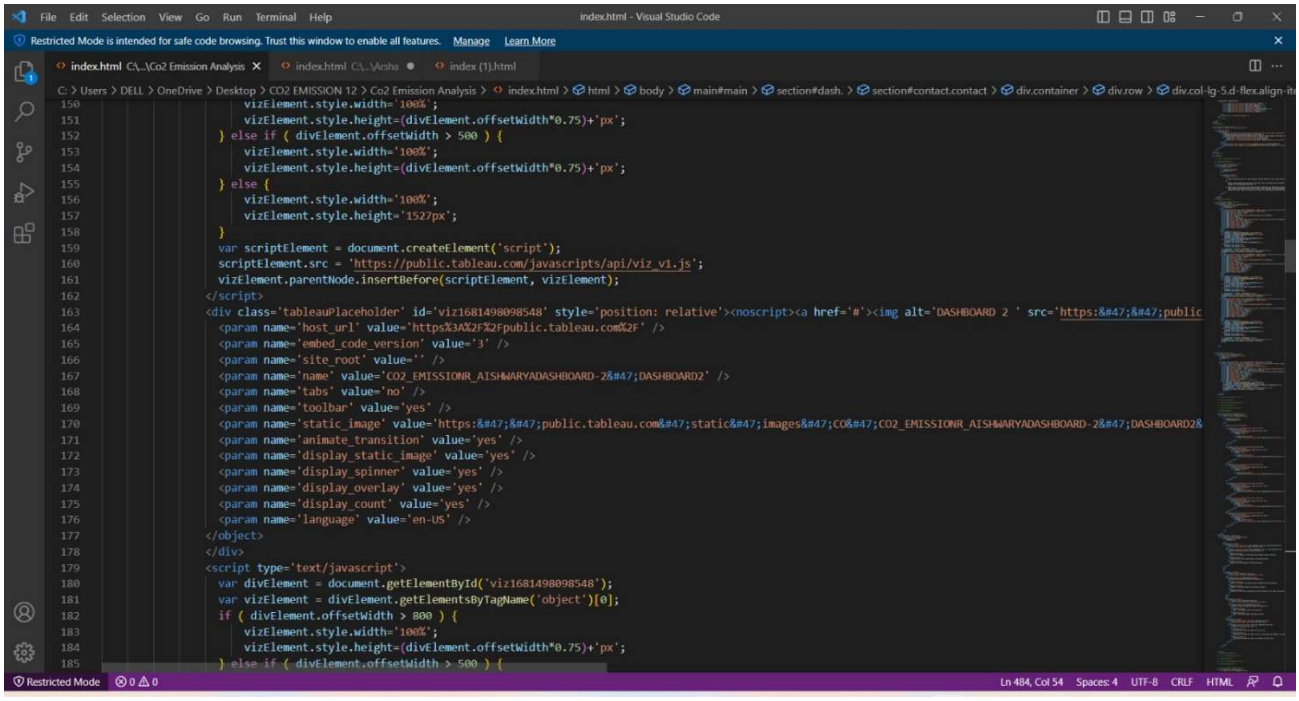
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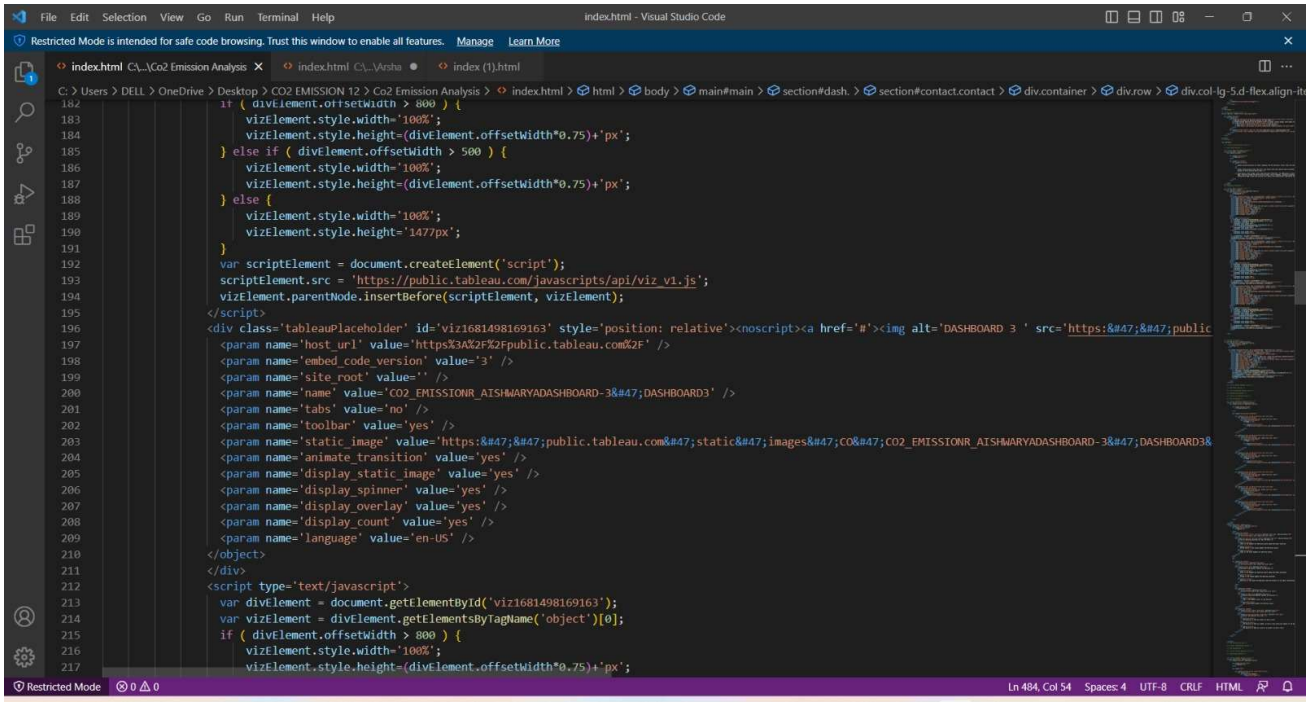
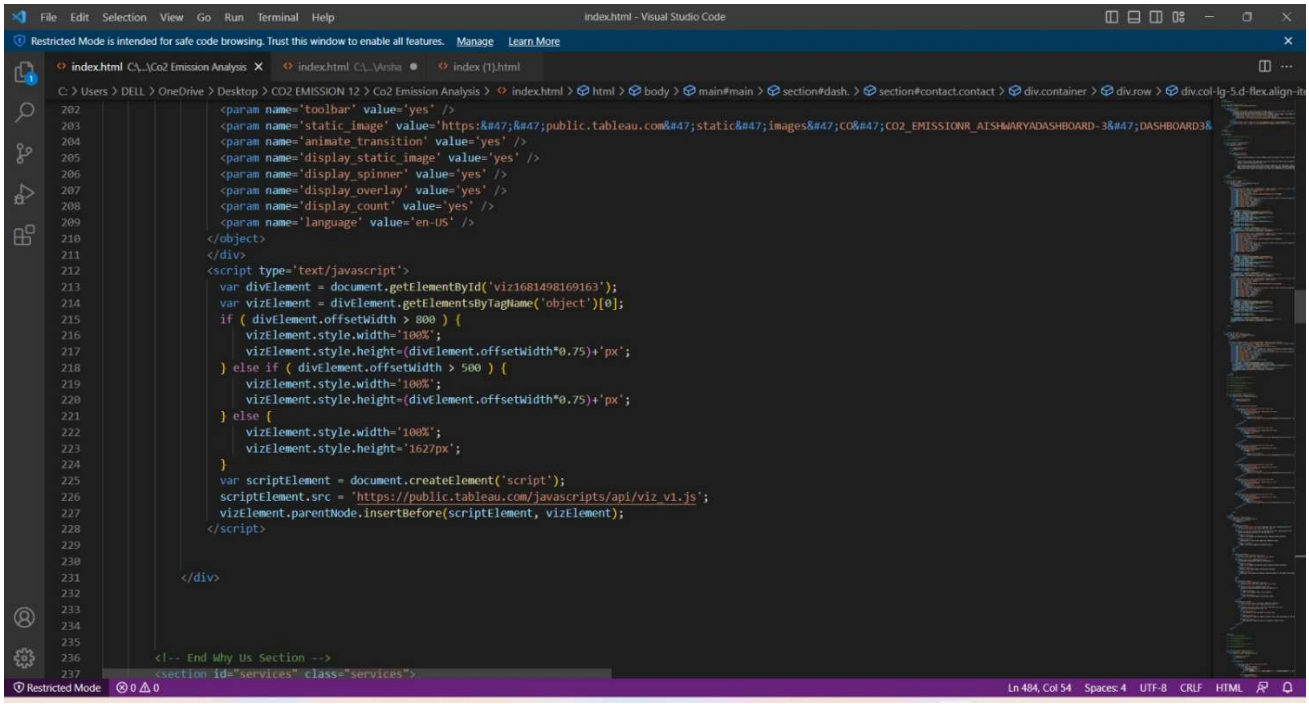
Restricted Mode
Ln 484, Col 54 Spaces: 4 UTF-8 CRLF HTML


File Edit Selection View Go Run Terminal Help
index.html - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
index.html C:\...\Co2 Emission Analysis
index.html C:\...\Arsha
index (1).html
C: > Users > DELL > OneDrive > Desktop > CO2 EMISSION 12 > Co2 Emission Analysis > index.html > html > body > main#main > section#dash. > section#contact.contact > div.container > div.row > div.col-lg-5.d-flex.align-it
if (divElement.offsetWidth > 800) {
vizElement.style.width='100%';
vizElement.style.height=(divElement.offsetWidth*0.75)+'px';
} else if (divElement.offsetWidth > 500) {
vizElement.style.width='100%';
vizElement.style.height=(divElement.offsetWidth*0.75)+'px';
} else {
vizElement.style.width='100%';
vizElement.style.height='1477px';
}
var scriptElement = document.createElement('script');
scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';
vizElement.parentNode.insertBefore(scriptElement, vizElement);
</script>
<noscript><a href='#'><img alt='DASHBOARD 3 ' src='https://public
<param name='host_url' value='https%3A%2F%2Fpublic.tableau.com%2F' />
<param name='embed_code_version' value='3' />
<param name='site_root' value='' />
<param name='name' value='CO2_EMISSIONR_AISHWARYADASHBOARD-3/DASHBOARD3' />
<param name='tabs' value='no' />
<param name='toolbar' value='yes' />
<param name='static_image' value='https://public.tableau.com/static/images/CO/CO2_EMISSIONR_AISHWARYADASHBOARD-3/DASHBOARD3&
<param name='animate_transition' value='yes' />
<param name='display_static_image' value='yes' />
<param name='display_spinner' value='yes' />
<param name='display_overlay' value='yes' />
<param name='display_count' value='yes' />
<param name='language' value='en-US' />
</object>

<script type='text/javascript'>
var divElement = document.getElementById('viz1681498169163');
var vizElement = divElement.getElementsByTagName('object')[0];
if (divElement.offsetWidth > 800) {
vizElement.style.width='100%';
vizElement.style.height=(divElement.offsetWidth*0.75)+'px';
Restricted Mode
Ln 484, Col 54 Spaces: 4 UTF-8 CRLF HTML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<param name='toolbar' value='yes' />
<param name='static_image' value='https://public.tableau.com/static/images/CO/CO2_EMISSIONR_AISHWARYADASHBOARD-3/DASHBOARD3&
<param name='animate_transition' value='yes' />
<param name='display_static_image' value='yes' />
<param name='display_spinner' value='yes' />
<param name='display_overlay' value='yes' />
<param name='display_count' value='yes' />
<param name='language' value='en-US' />
</object>

<script type='text/javascript'>
var divElement = document.getElementById('viz1681498169163');
var vizElement = divElement.getElementsByTagName('object')[0];
if (divElement.offsetWidth > 800) {
vizElement.style.width='100%';
vizElement.style.height=(divElement.offsetWidth*0.75)+'px';
} else if (divElement.offsetWidth > 500) {
vizElement.style.width='100%';
vizElement.style.height=(divElement.offsetWidth*0.75)+'px';
} else {
vizElement.style.width='100%';
vizElement.style.height='1627px';
}
var scriptElement = document.createElement('script');
scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';
vizElement.parentNode.insertBefore(scriptElement, vizElement);
</script>

<!-- End Why Us Section -->
<section id="services" class="services">
Restricted Mode
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