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

SUBMITTED BY

REG NO:	NAME
32720U28003	GOPI.P
32720U28007	KARTHI.K
32720U28010	NANDHAKUMAR.C
32720U28015	SAKTHIKUMAR.K

DEPARTMENT OF BACHELOR OF SCIENCE IN PHYSICS

S.S.S COLLEGE ARTS, SCIENCE AND MANAGEMENT

ARCOT-632505

PROJECT CONTENT

1. INTRODUCTION

Global warming is one of the biggest challenges currently being faced by the human race, although correlation is not causation, a likely Cause of global warming is due to increased atmospheric carbon dioxide from human activities. **CO2 Emission** refers to the Carbon Dioxide emitted throughout the world. For this analysis we will be focusing on CO2 Emissions and its effect on the world we live in as well as some key factors and stats that may play a role in the emission of CO2 globally. Fossil fuel use is the primary source of CO2. The data throws light onto how much fossil fuels are burnt, per year per nation, which amounts to an increase in CO2 every year. This will help researchers and environment experts to predict global warming.

Carbon dioxide is also a greenhouse gas produced as a byproduct of human activities. Burning fossil fuels—coal, oil, and natural gas—is the number one source of global CO2 emissions. In 2009, the world got more than 80% of its energy from fossil fuels. Sixteen countries got 99% or more of their energy from fossil fuels.

So countries should set a goal to decrease this amount yearly. Analyzing Global Co2 Emission across countries from 1975 to 2020. This dataset contains a record of Co2 Emission by each Country and Region of Earth, here we are going to analyze and visualize Country wise, Region wise and Overall Co2 Emission on Earth.

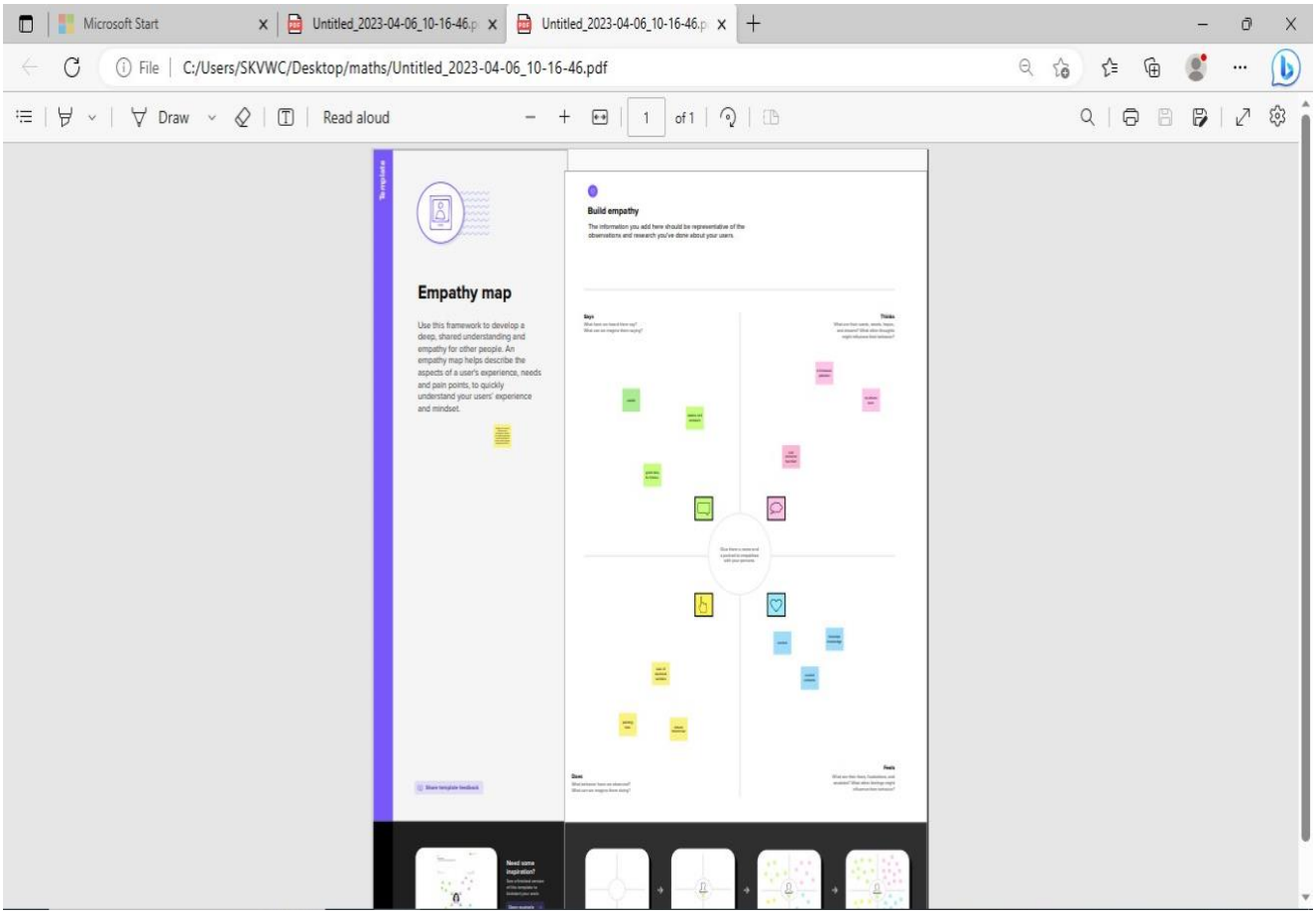
2. PROJECT DEFINITION, PURPOSE & DESIGN THINKING

New opportunities to use carbon dioxide (CO2) in the development of an products services are capturing the attention of governments, industry and the investment community interested in mitigating climate change as well as in other factors, including technology leadership & supporting a circular economy. This analysis considers the near - term market potential for five key categories of CO_2 derived products and services: fuels, chemicals, building materials from minerals, building materials from waste, and CO_2 use to enhance the yields of biological processes.

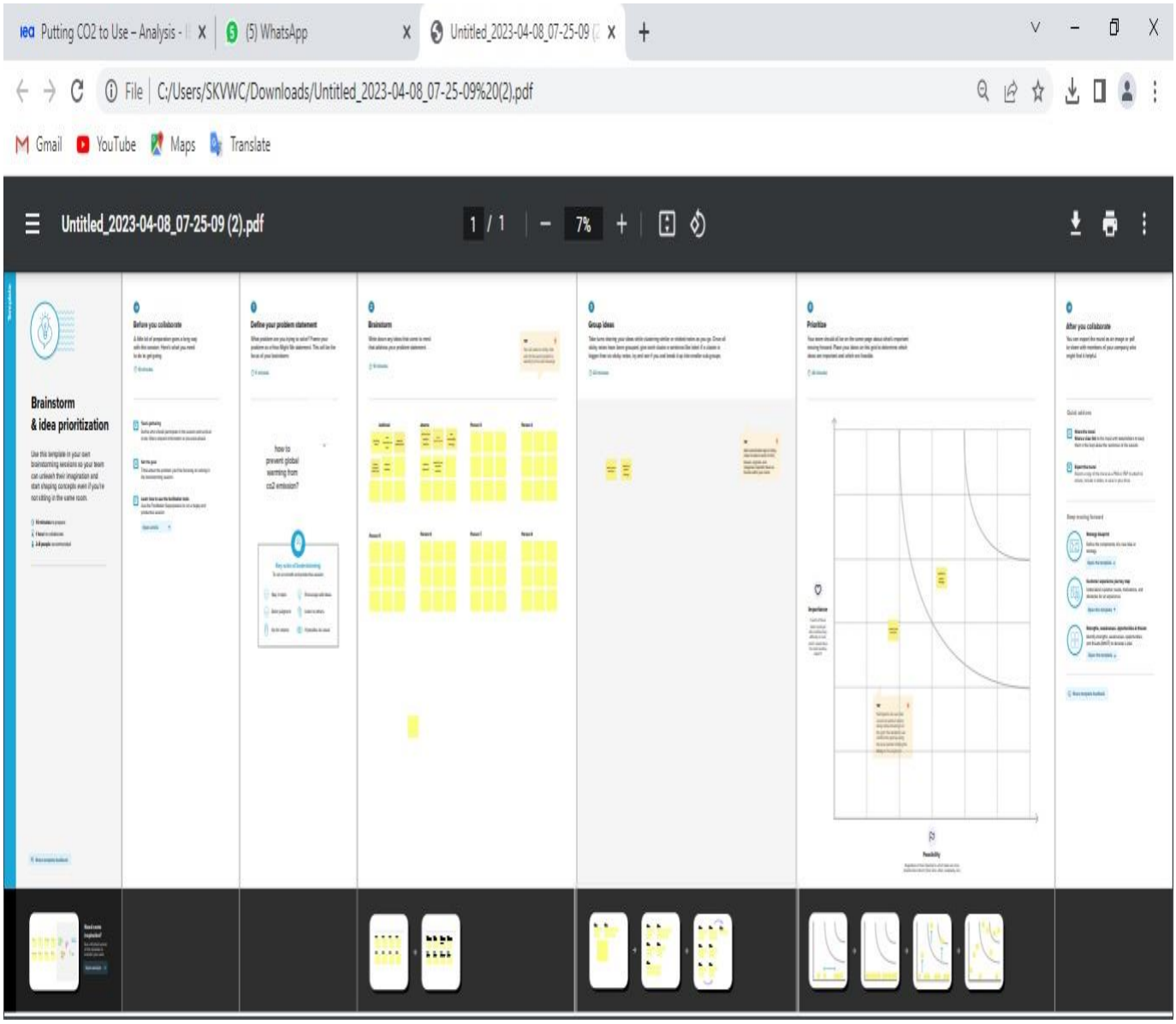
Five categories could individually Be scaled- up to a market size of at least almost as the current CO_2 demand for food and beverages but most face commercial and regulatory barriers. CO_2 use can support climate goals where the application is scalable, uses low carbon energy and displaces a product with higher life-cycle emissions.

Some CO2-derived products also involve permanent carbon retention, in particular building materials. Fossil fuel use is the primary source of CO_2. CO_2 can also be emitted from direct human-induced impacts on forestry and other land use, such as through deforestation, land clearing for agriculture, and degradation of soils. Likewise, land can also remove CO_2 from the atmosphere through reforestation, improvement of soils, and other activities.

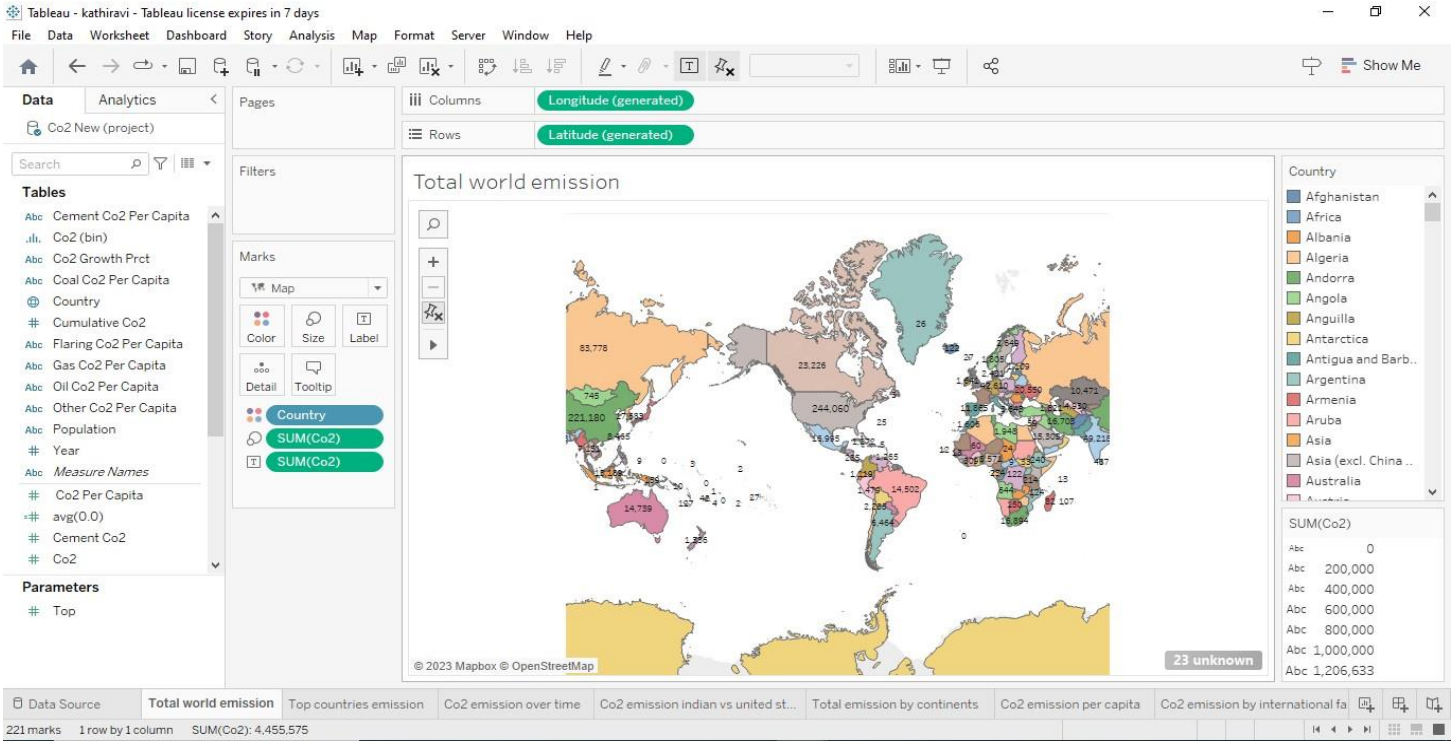
2.1 EMPATHY MAP



2.2 IDEATION AND BRAINSTORMING MAP



3.RESULTS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Co2 New (project)
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Cement Co2 Per Capita
Co2 (bin)
Co2 Growth Prct
Coal Co2 Per Capita
Country
Cumulative Co2
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Year
Measure Names
Co2 Per Capita
avg(0.0)
Cement Co2
Co2
Parameters
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Pages
Filters
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Map
Color
Size
Label
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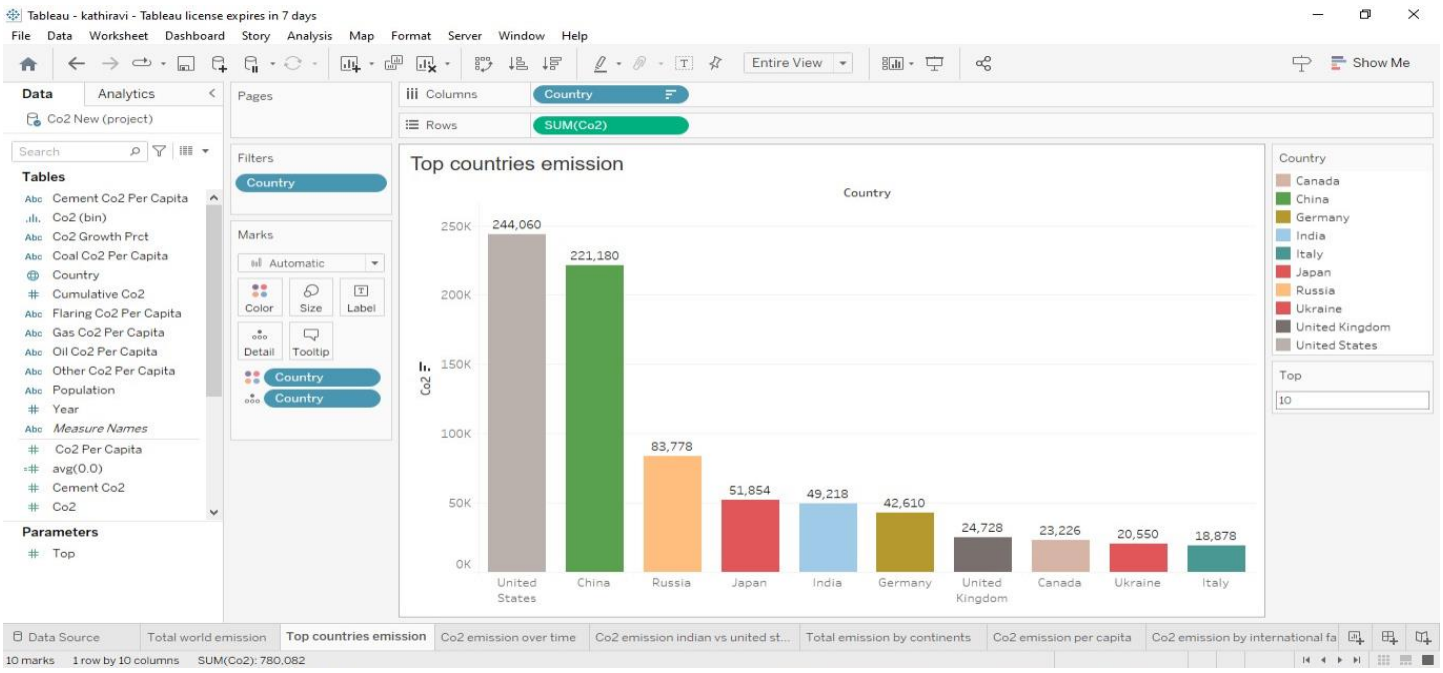
Tooltip
Country
SUM(Co2)
SUM(Co2)
Columns
Longitude (generated)
Rows
Latitude (generated)
Total world emission
© 2023 Mapbox © OpenStreetMap
23 unknown
Country
Afghanistan
Africa
Albania
Algeria
Andorra
Angola
Anguilla
Antarctica
Antigua and Barb..
Argentina
Armenia
Aruba
Asia
Asia (excl. China ..
Australia
SUM(Co2)
0
200,000
400,000
600,000
800,000
1,000,000
1,206,633
Data Source
Total world emission
Top countries emission
Co2 emission over time
Co2 emission indian vs united st...
Total emission by continents
Co2 emission per capita
Co2 emission by international fa
221 marks
1 row by 1 column
SUM(Co2): 4,455,575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Country
Cumulative Co2
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Year
Measure Names
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Co2
Parameters
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Country
Marks
Automatic
Color
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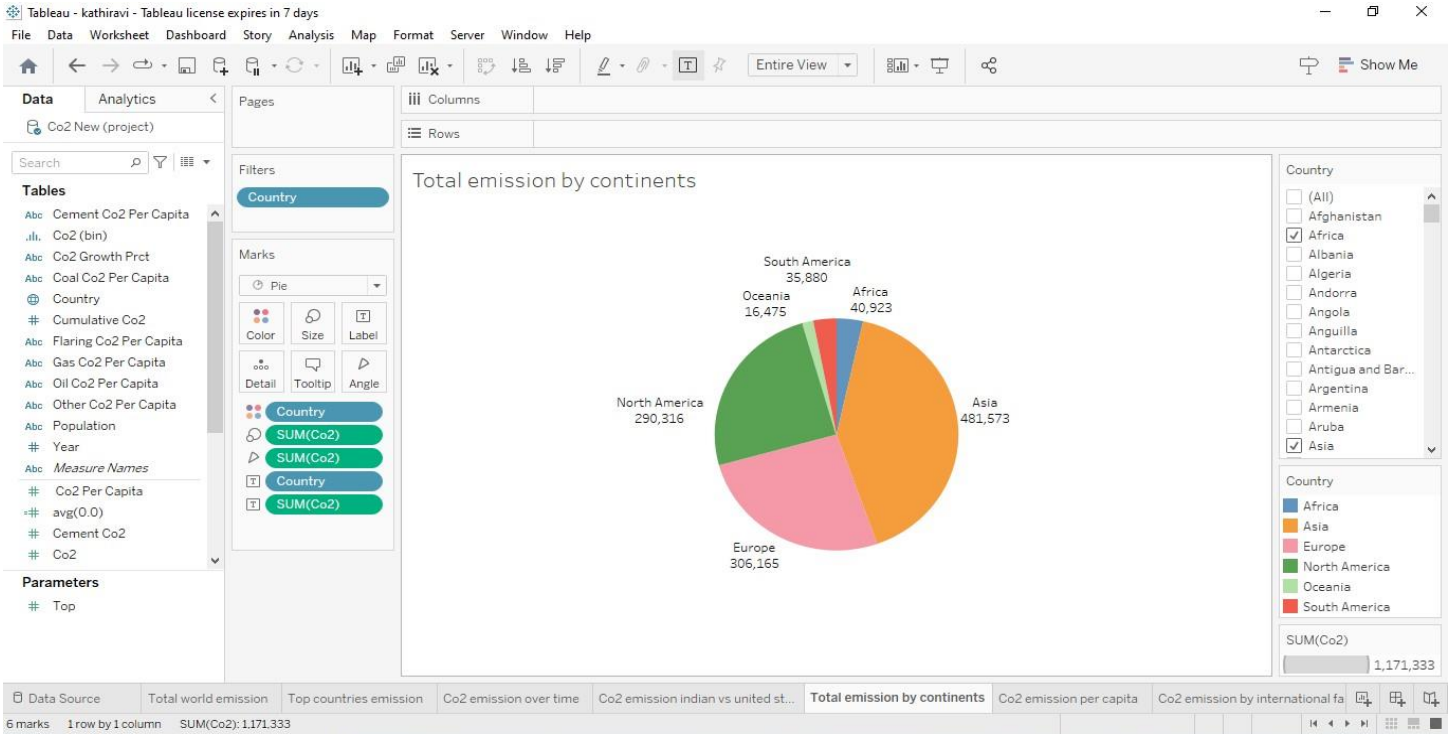
Country
Country
Columns
Country
Rows
SUM(Co2)
Top countries emission
Country
Co2
250K
200K
150K
100K
50K
0K
244,060
221,180
83,778
51,854
49,218
42,610
24,728
23,226
20,550
18,878
United States
China
Russia
Japan
India
Germany
United Kingdom
Canada
Ukraine
Italy
Country
Canada
China
Germany
India
Italy
Japan
Russia
Ukraine
United Kingdom
United States
Top
10
Data Source
Total world emission
Top countries emission
Co2 emission over time
Co2 emission indian vs united st...
Total emission by continents
Co2 emission per capita
Co2 emission by international fa
10 marks
1 row by 10 columns
SUM(Co2): 780,082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Abc Gas Co2 Per Capita
Abc Oil Co2 Per Capita
Abc Other Co2 Per Capita
Abc Population
Year
Abc Measure Names
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Cement Co2
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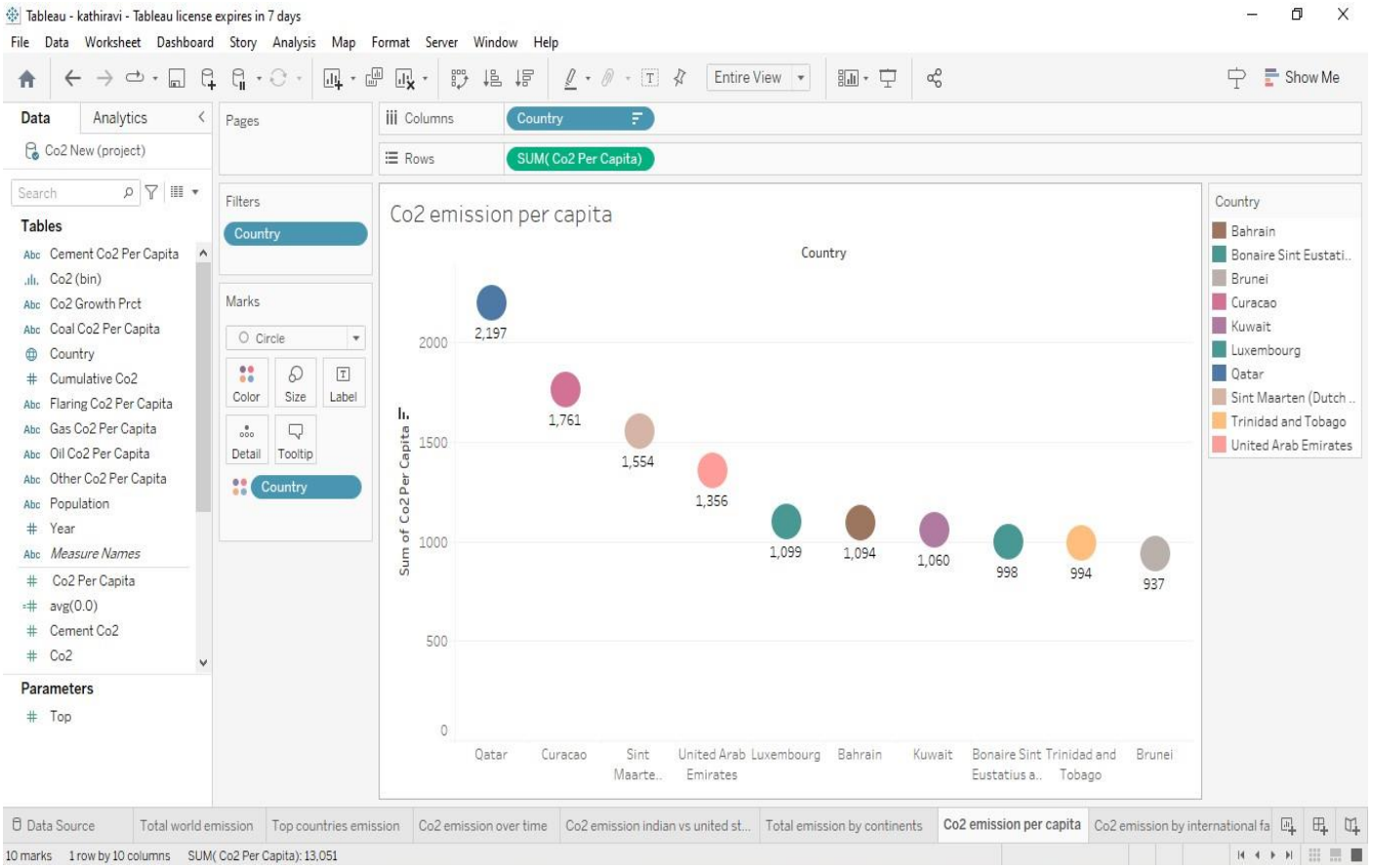
Country
SUM(Co2)
SUM(Co2)
Country
SUM(Co2)
Total emission by continents
South America
35,880
Oceania
16,475
Africa
40,923
North America
290,316
Asia
481,573
Europe
306,165
Country
(All)
Afghanistan
Africa
Albania
Algeria
Andorra
Angola
Anguilla
Antarctica
Antigua and Bar...
Argentina
Armenia
Aruba
Asia
Country
Africa
Asia
Europe
North America
Oceania
South America
SUM(Co2)
1,171,333
Data Source
Total world emission
Top countries emission
Co2 emission over time
Co2 emission indian vs united st...
Total emission by continents
Co2 emission per capita
Co2 emission by international fa
6 marks
1 row by 1 column
SUM(Co2): 1,171,333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Cumulative Co2
Abc Flaring Co2 Per Capita
Abc Gas Co2 Per Capita
Abc Oil Co2 Per Capita
Abc Other Co2 Per Capita
Abc Population
Year
Abc Measure Names
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Country
Co2 emission per capita
Country
Sum of Co2 Per Capita
2000
1500
1000
500
0
2,197
1,761
1,554
1,356
1,099
1,094
1,060
998
994
937
Qatar
Curacao
Sint Maarte..
United Arab Emirates
Luxembourg
Bahrain
Kuwait
Bonaire Sint Eustatius a..
Trinidad and Tobago
Brunei
Country
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United Arab Emirates
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Total world emission
Top countries emission
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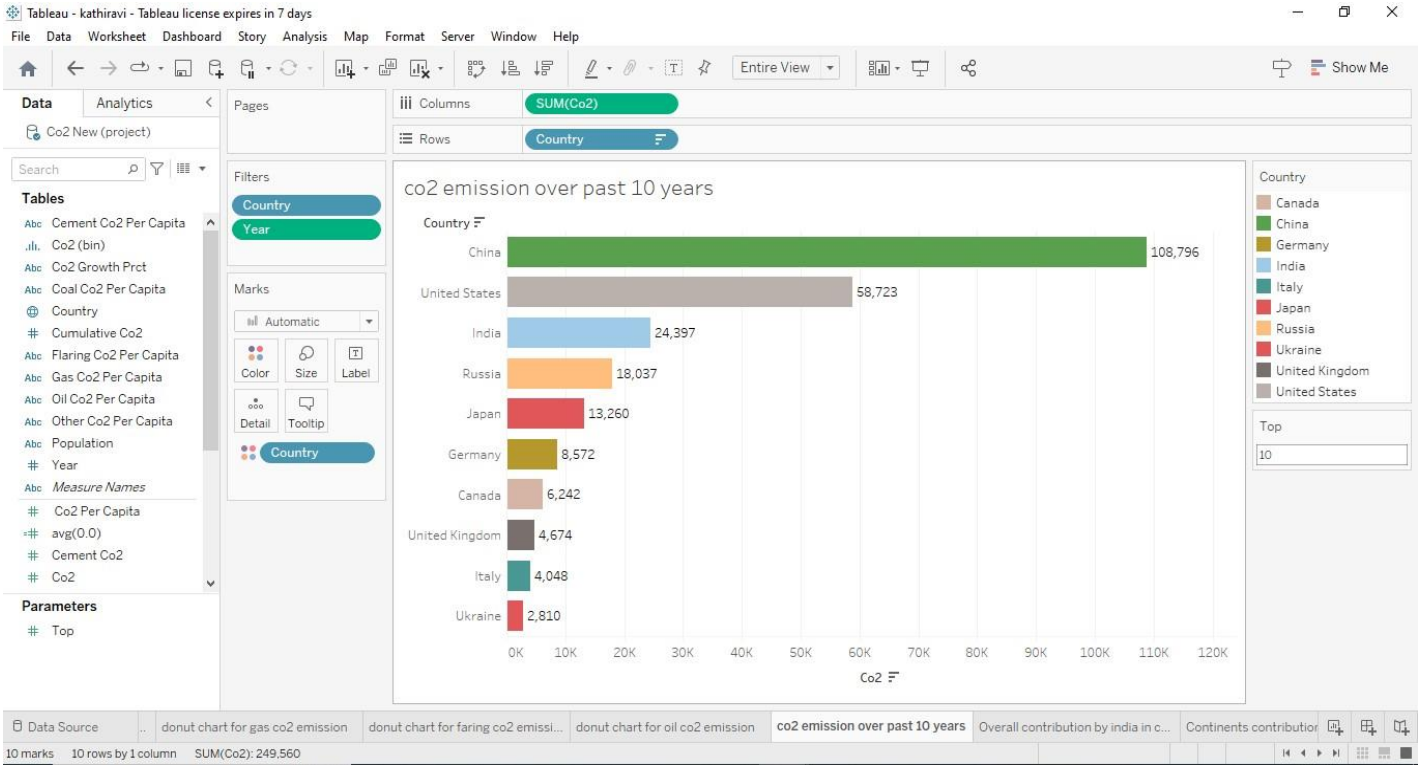
10 marks
1 row by 10 columns
SUM(Co2 Per Capita): 13,051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Abc Coal Co2 Per Capita
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Abc Other Co2 Per Capita
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SUM(Co2)
Rows
Country
co2 emission over past 10 years
Country
China
United States
India
Russia
Japan
Germany
Canada
Italy
United Kingdom
Ukraine
108,796
58,723
24,397
18,037
13,260
8,572
6,242
4,674
4,048
2,810
0K 10K 20K 30K 40K 50K 60K 70K 80K 90K 100K 110K 120K
Co2
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donut chart for gas co2 emission
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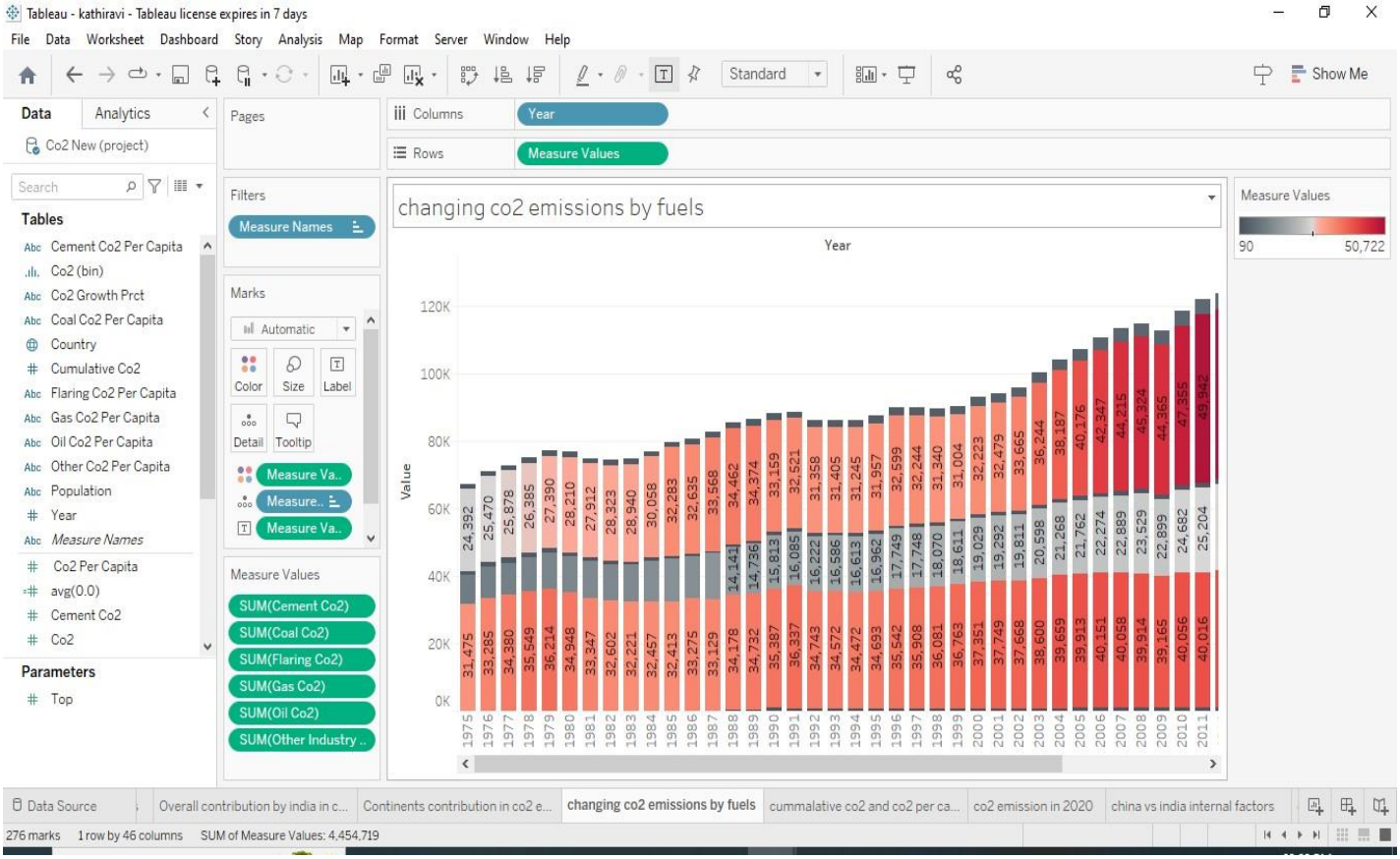
Overall contribution by india in c...
Continents contributior
10 marks
10 rows by 1 column
SUM(Co2): 249,560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Abc Gas Co2 Per Capita
Abc Oil Co2 Per Capita
Abc Other Co2 Per Capita
Abc Population
Year
Abc Measure Names
Co2 Per Capita
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Cement Co2
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SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Gas Co2)
SUM(Oil Co2)
SUM(Other Industry ..
Columns
Year
Rows
Measure Values
changing co2 emissions by fuels
Year
Value
120K
100K
80K
60K
40K
20K
0K
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Measure Values
90
50,722
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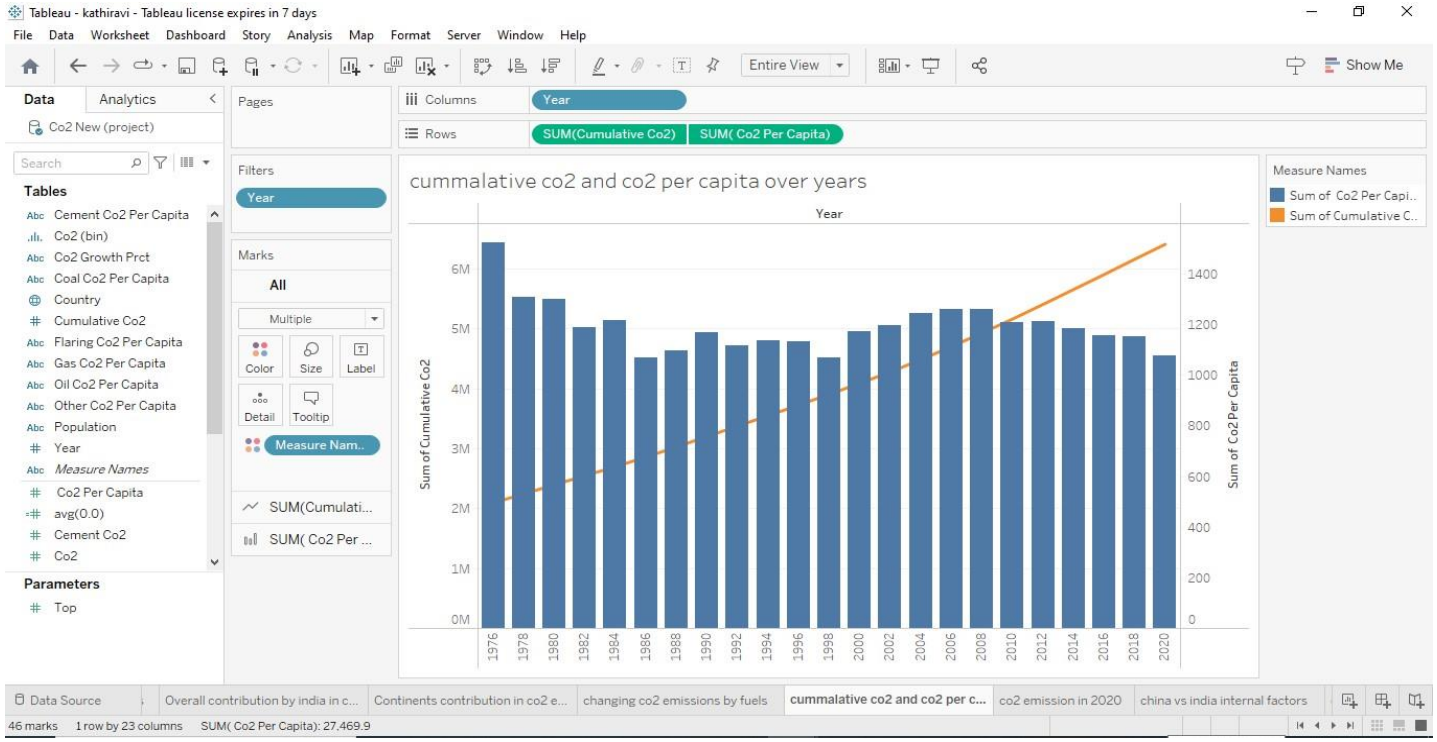
Overall contribution by india in c...
Continents contribution in co2 e...
changing co2 emissions by fuels
cummalative co2 and co2 per ca...
co2 emission in 2020
china vs india internal factors
276 marks
1 row by 46 columns
SUM of Measure Values: 4,454,719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Co2 (bin)
Co2 Growth Prct
Coal Co2 Per Capita
Country
Cumulative Co2
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Year
Measure Names
Co2 Per Capita
avg(0.0)
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Co2
Parameters
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Columns
Year
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SUM(Co2 Per Capita)
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Measure Nam..
SUM(Cumulati...
SUM(Co2 Per ...
cummalative co2 and co2 per capita over years
Year
Sum of Cumulative Co2
Sum of Co2 Per Capita
Measure Names
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Sum of Cumulative C..
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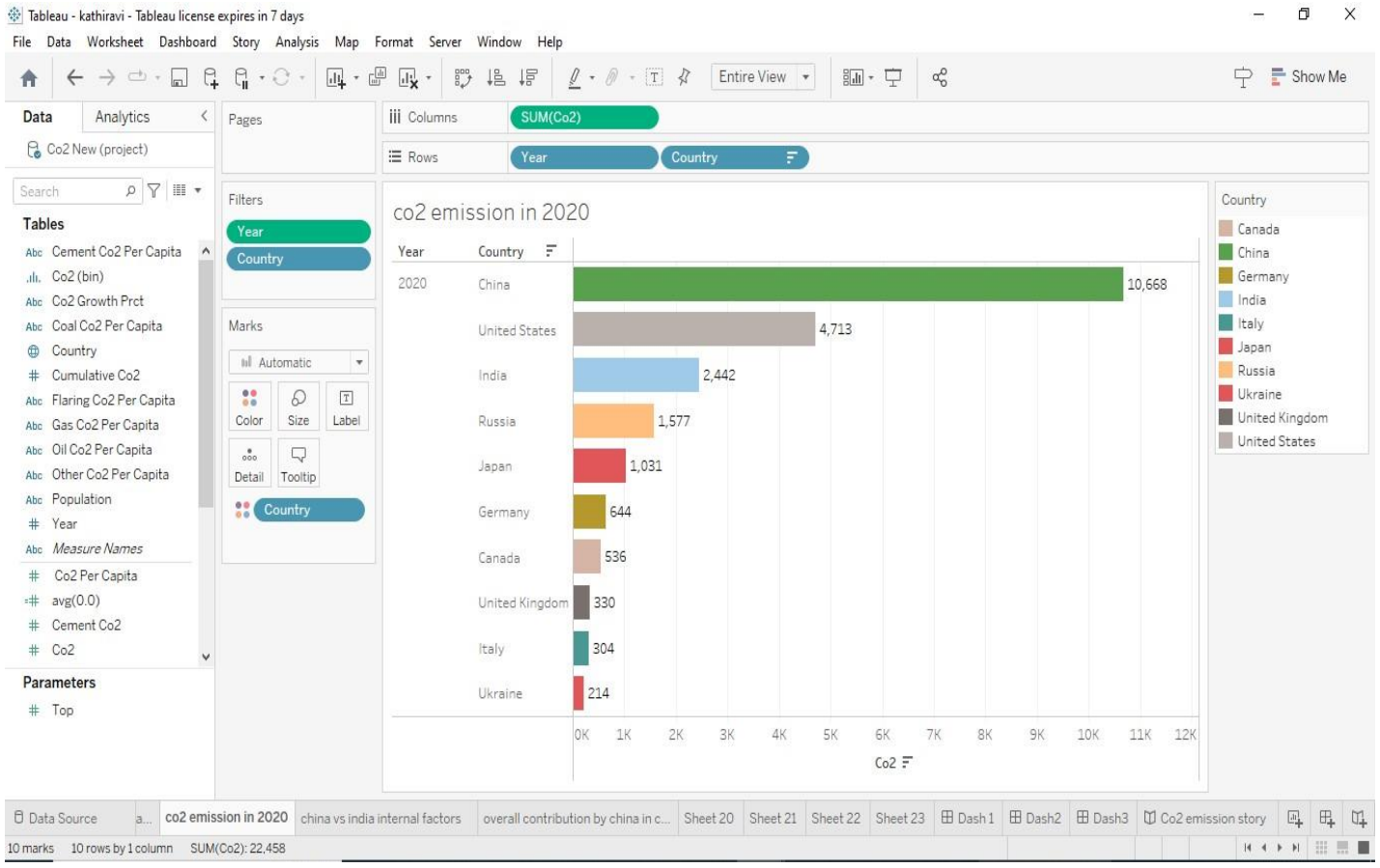
Overall contribution by india in c...
Continents contribution in co2 e...
changing co2 emissions by fuels
cummalative co2 and co2 per c...
co2 emission in 2020
china vs india internal factors
46 marks
1 row by 23 columns
SUM(Co2 Per Capita): 27,469.9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Co2 (bin)
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Cumulative Co2
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
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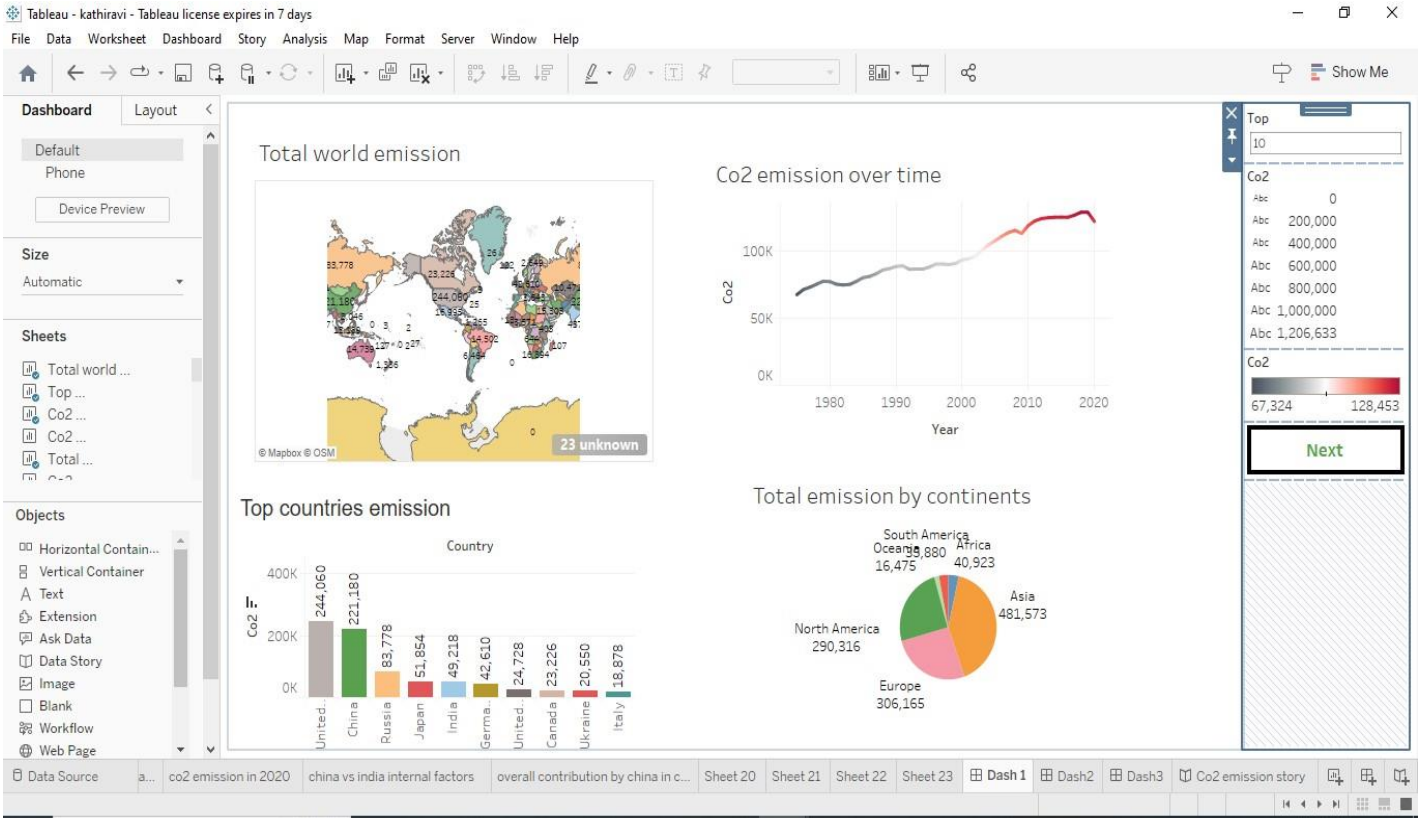
Country
co2 emission in 2020
Year
Country
2020
China
United States
India
Russia
Japan
Germany
Canada
United Kingdom
Italy
Ukraine
10,668
4,713
2,442
1,577
1,031
644
536
330
304
214
0K
1K
2K
3K
4K
5K
6K
7K
8K
9K
10K
11K
12K
Co2
Country
Canada
China
Germany
India
Italy
Japan
Russia
Ukraine
United Kingdom
United States
Data Source
co2 emission in 2020
china vs india internal factors
overall contribution by china in c...
Sheet 20
Sheet 21
Sheet 22
Sheet 23
Dash1
Dash2
Dash3
Co2 emission story
10 marks
10 rows by 1 column
SUM(Co2): 22,458

DASHBOARD


Total world emission
23 unknown
© Mapbox © OSM
Co2 emission over time
Co2
100K
50K
0K
1980
1990
2000
2010
2020
Year
Top
10
Co2
0
200,000
400,000
600,000
800,000
1,000,000
1,206,633
67,324
128,453
Next
Top countries emission
Country
400K
200K
0K
244,060
221,180
83,778
51,854
49,218
42,610
24,728
23,226
20,550
18,878
China
Russia
Japan
India
Canada
Ukraine
Italy
Total emission by continents
South America
Oceania 38,880
16,475
Africa
40,923
Asia
481,573
North America
290,316
Europe
306,165
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overall contribution by china in c...
Sheet 20
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Sheet 22
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Dash 1
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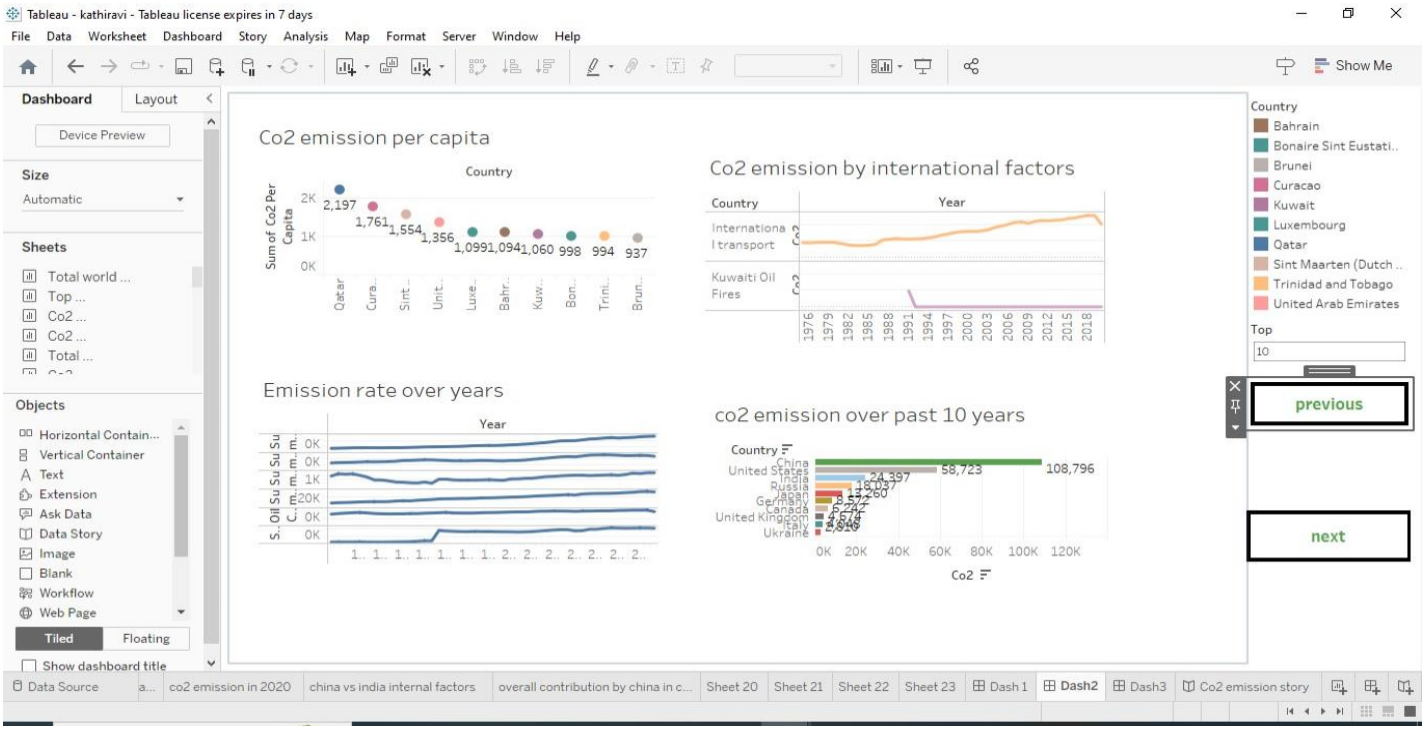
Dash3
Co2 emission story


Co2 emission per capita
Country
Sum of Co2 Per Capita
2K
1K
0K
2,197
1,761
1,554
1,356
1,099
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1,060
998
994
937
Qatar
Cura...
Sint...
Unit...
Luxe...
Bahr...
Kuw...
Bon...
Trini...
Brun...
Co2 emission by international factors
Country
Year
Internationa l transport
Kuwaiti Oil Fires
Co2
1976
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
Emission rate over years
Year
Co2 emission over past 10 years
Country
China
United States
India
Russia
Japan
Germany
Canada
United Kingdom
Italy
Ukraine
58,723
24,397
18,037
108,796
0K
20K
40K
60K
80K
100K
120K
Co2
Country
Bahrain
Bonaire Sint Eustati..
Brunei
Curacao
Kuwait
Luxembourg
Qatar
Sint Maarten (Dutch ..
Trinidad and Tobago
United Arab Emirates
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Data Source
co2 emission in 2020
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overall contribution by china in c...
Sheet 20
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Dash 1
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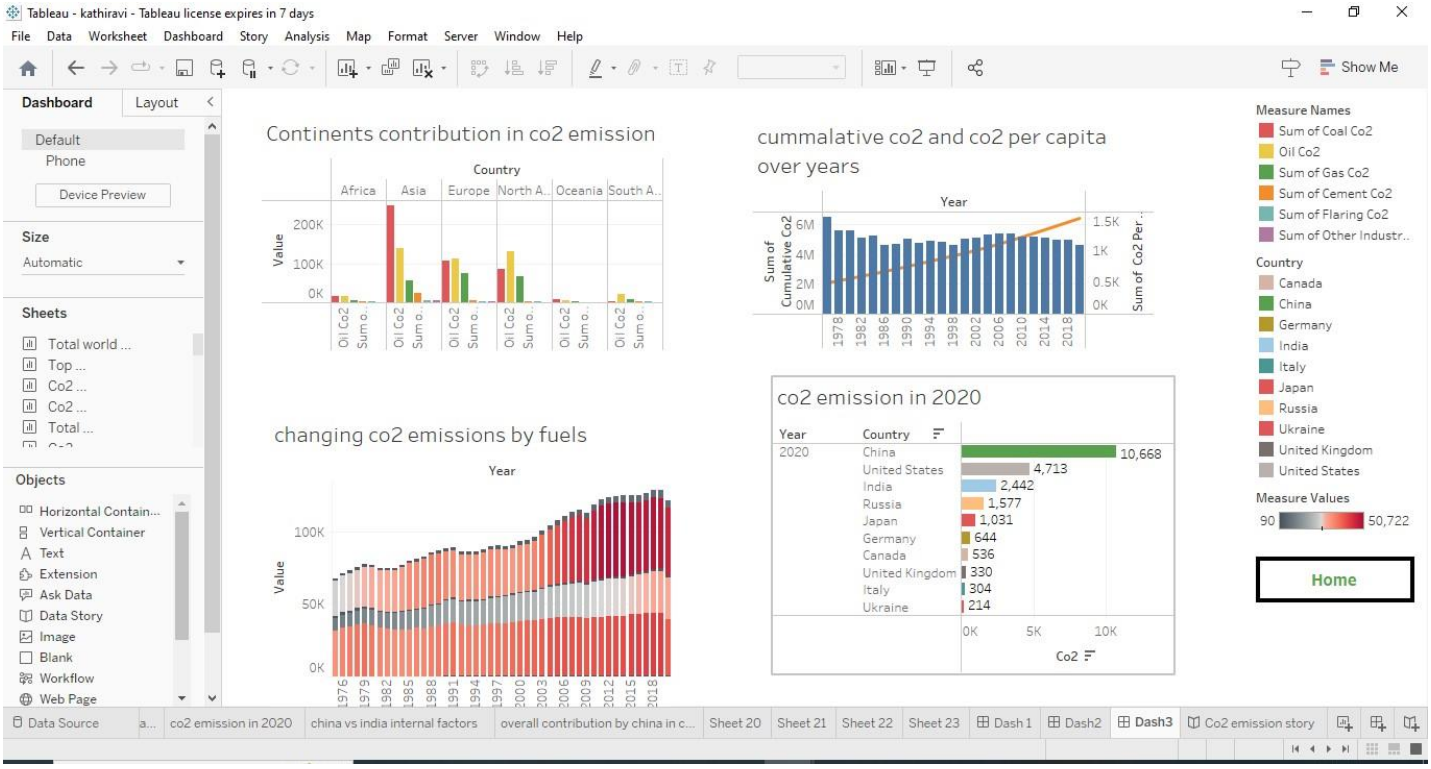
Co2 emission story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Top ...
Co2 ...
Co2 ...
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Extension
Ask Data
Data Story
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Workflow
Web Page
Continents contribution in co2 emission
Country
Africa
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Europe
North A...
Oceania
South A...
Value
200K
100K
0K
cummalative co2 and co2 per capita over years
Year
Sum of Cumulative Co2
6M
4M
2M
0M
1.5K
1K
0.5K
0K
Sum of Co2 Per ...
changing co2 emissions by fuels
Year
Value
100K
50K
0K
co2 emission in 2020
Year
Country
2020
China
10,668
United States
4,713
India
2,442
Russia
1,577
Japan
1,031
Germany
644
Canada
536
United Kingdom
330
Italy
304
Ukraine
214
0K
5K
10K
Co2
Measure Names
Sum of Coal Co2
Oil Co2
Sum of Gas Co2
Sum of Cement Co2
Sum of Flaring Co2
Sum of Other Industr..
Country
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Germany
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Italy
Japan
Russia
Ukraine
United Kingdom
United States
Measure Values
90
50,722
Home
Data Source
co2 emission in 2020
china vs india internal factors
overall contribution by china in c...
Sheet 20
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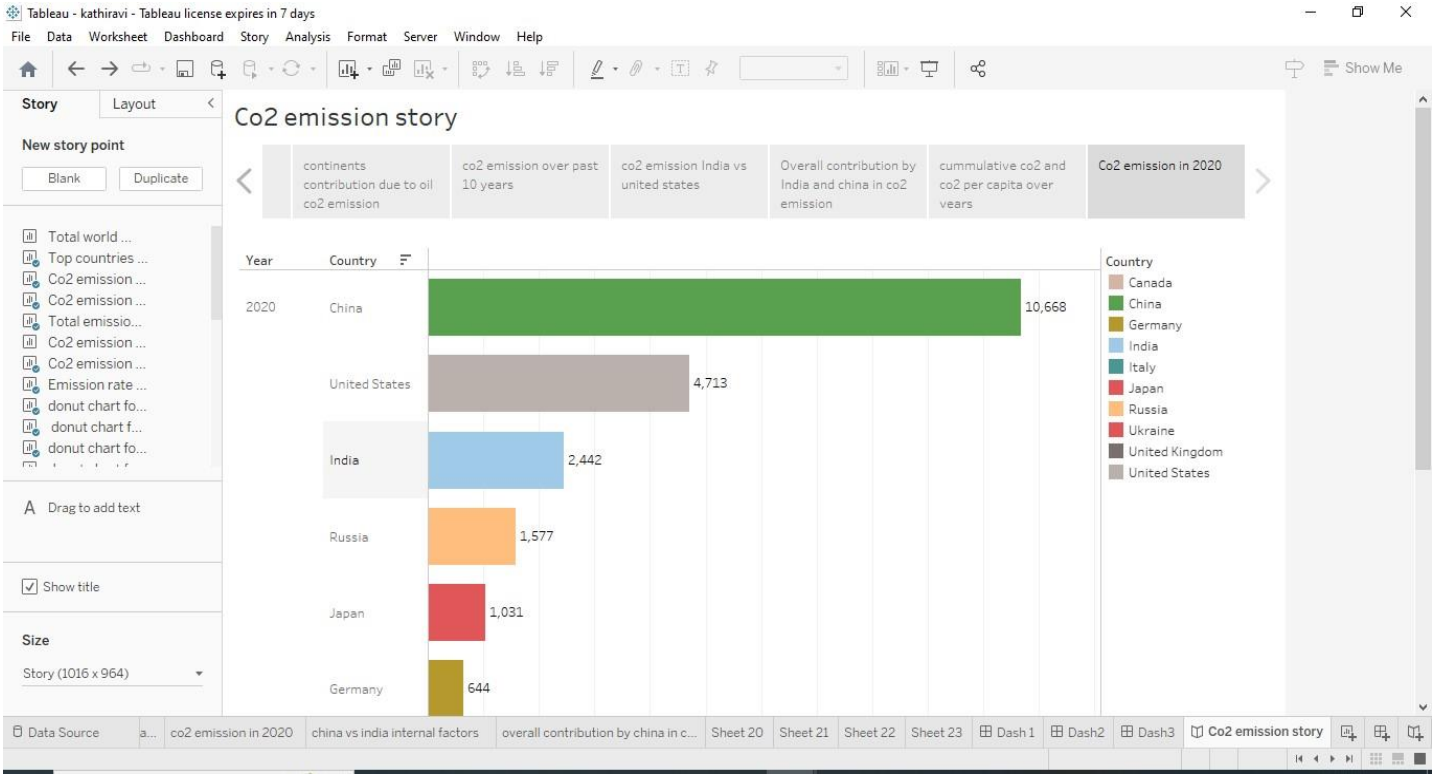
Dash 1
Dash2
Dash3
Co2 emission story

STORY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Co2 emission story
continents contribution due to oil co2 emission
co2 emission over past 10 years
co2 emission India vs united states
Overall contribution by India and china in co2 emission
cummulative co2 and co2 per capita over years
Co2 emission in 2020
Year
Country
2020
China
10,668
United States
4,713
India
2,442
Russia
1,577
Japan
1,031
Germany
644
Country
Canada
China
Germany
India
Italy
Japan
Russia
Ukraine
United Kingdom
United States
Data Source
co2 emission in 2020
china vs india internal factors
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4. ADVANTAGES AND DISADVANTAGES

4.1 Advantages:

- Green plants grow faster with more CO2. Many also become more drought- resistant because higher CO2 levels allow plants to use water more efficiently. More abundant vegetation from increased CO2 is already apparent.
- Because air pollution and greenhouse gases are often released from the same sources, cutting greenhouse gas emissions in an effort to slow climate change also reduces air pollutants, such as fine particulate matter ($PM_{2.5}$).
- Reducing these co-emitted air pollutants improves air quality and benefits human health. Reducing global greenhouse gas emissions to slow climate change could prevent millions of premature deaths due to air pollution over the next century

4.2 Disadvantages:

- As CO_2 levels rise, the Earth's temperatures rise with it, causing the melting of the polar ice caps directly into the oceans. Increased water levels lower our oceanfront wetlands and sea fronts.
- Carbon dioxide in the atmosphere warms the planet, causing climate change. Human activities have raised the atmosphere's carbon dioxide content by 50% in less than 200 years.
- 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 Climate change is altering our planet, causing extreme weather events like tropical storms, wildfires, severe droughts and heat waves, negatively affecting crop production,

causing disruption to animals' natural habitats, and more. Because the emission of greenhouse gases is the main perpetrator that causes global warming .

5.APPLICATIONS

5.1 Multi-Industry Uses for Carbon Dioxide (CO_2):

Carbon dioxide in solid and in liquid form is used for refrigeration and cooling. It is used as an inert gas in chemical processes, in the storage of carbon powder and in fire extinguishers.

5.2 Metals Industry:

Carbon dioxide is used in the manufacture of casting molds to enhance their hardness.

5.3 Manufacturing and Construction Uses:

Carbon dioxide is used on a large scale as a shield gas in MIG/MAG welding, where the gas protects the weld puddle against oxidation by the surrounding air. A mixture of argon and carbon dioxide is commonly used today to achieve a higher welding rate and reduce the need for post weld treatment. .

5.4 Chemicals, Pharmaceuticals and Petroleum Industry Uses:

Large quantities are used as a raw material in the chemical process industry, especially for methanol and urea production. Carbon dioxide is used in oil wells for oil extraction and to maintain pressure within a formation. When CO_2 is pumped into an oil well, it is partially dissolved into the oil, rendering it less viscous, allowing the oil to be extracted more easily from the bedrock. Considerably more oil can be extracted from through this process.

5.5 Rubber and Plastics Industry Uses:

Flash is removed from rubber objects by tumbling them with crushed dry ice in a rotating drum.

6.CONCLUSION:

"The rising level of atmospheric CO2 could be the one global natural resource that is progressively increasing food production and total biological output, in a world of otherwise diminishing natural resources of land, water, energy, minerals, and fertilizer. It is a means of inadvertently increasing the productivity of farming systems and other photo synthetically active ecosystems. The effects know no boundaries and both developing and developed countries are, and will be, sharing equally," for "the rising level of atmospheric CO2 is a universally free premium, gaining in magnitude with time, on which we all can reckon for the foreseeable future".

7. FUTURE SCOPE OF CO2 EMISSION

- The carbon (and oxygen) in CO2 can be used as an alternative to fossil fuels in the production of chemicals, including plastics, and synthetic rubber. As with CO_2 derived fuels, converting CO_2 to methanol and methane is the most technologically mature pathway.
- In our project, set the goal for indian country, the world's third-biggest emitter of greenhouse gases, to reach net-zero emissions by 2070. To keep global warming to no more than 1.5°C as called for in the Paris Agreement – emissions need to be reduced by 45% by 2030 and reach net zero by 2050. To meet these goals, global carbon dioxide emissions need to be reduced by 45 percent by 2030 from 2010 levels, and reach net-zero emissions by 2050.