

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

PROJECT REPORT TEMPLATE

INTRODUCTION

Human activities are the main driver of increasing the emission of CO₂ in the atmosphere which is very dangerous as it makes global warming more powerful day by day. Let us discuss about that,

1.1 Overview

Carbon dioxide is an important gas for life on the planet. (Remember our deep breath in and out?) It is crucial to maintaining the protective blanket that is Earth's atmosphere. Carbon dioxide is often called "C-O-2" (pronounced see-oh-two) and written as "CO₂" because "C" stands for carbon and "O" stands for oxygen. Carbon dioxide is one of the primary greenhouse gases on Earth.

The global CO₂ emissions and energy demand numbers are based on the IEA's detailed region-by-region and fuel-by-fuel analysis, drawing on the latest official national data and publicly available energy, economic and weather data. Combined with the methane emissions estimates published by the IEA and estimates of nitrous oxide and flaring related CO₂ emissions, this new analysis shows that overall greenhouse gas emissions from energy rose to their highest ever level in 2021.

1.2 Purpose

USES

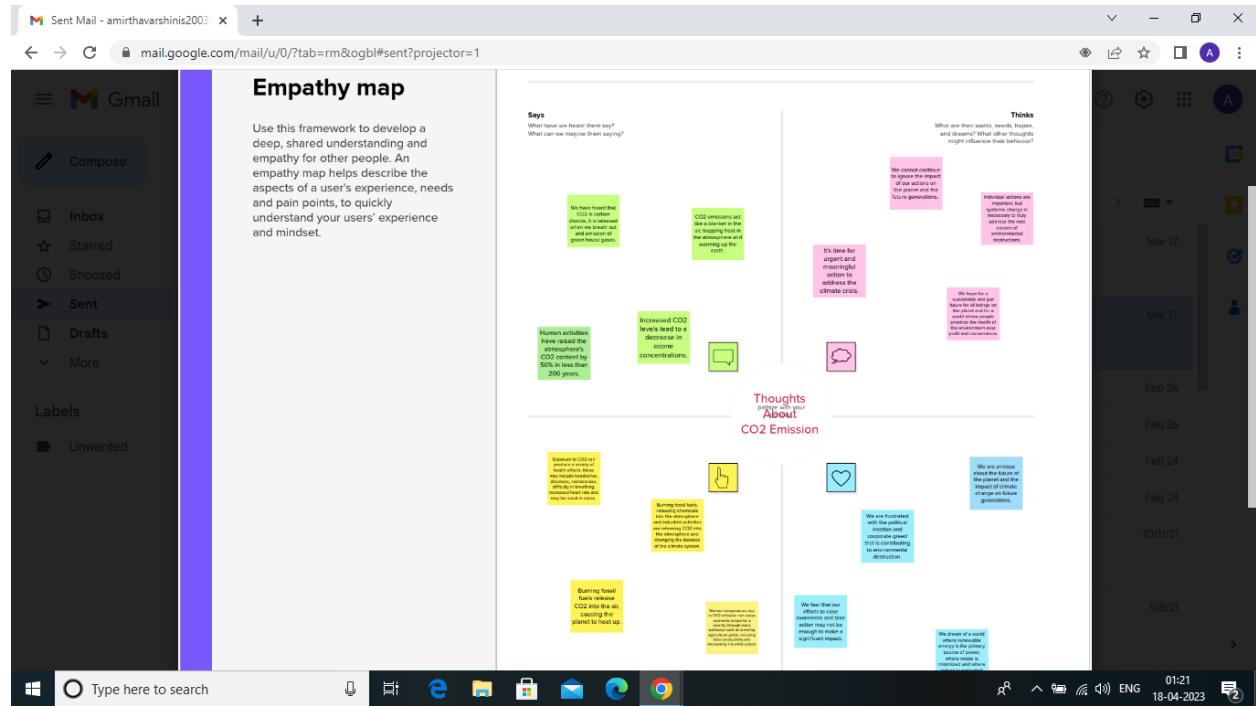
Carbon is in carbon dioxide, which is a greenhouse gas that traps heat close to Earth.

It helps Earth hold some of the heat it receives from the Sun so it doesn't all escape back into space.

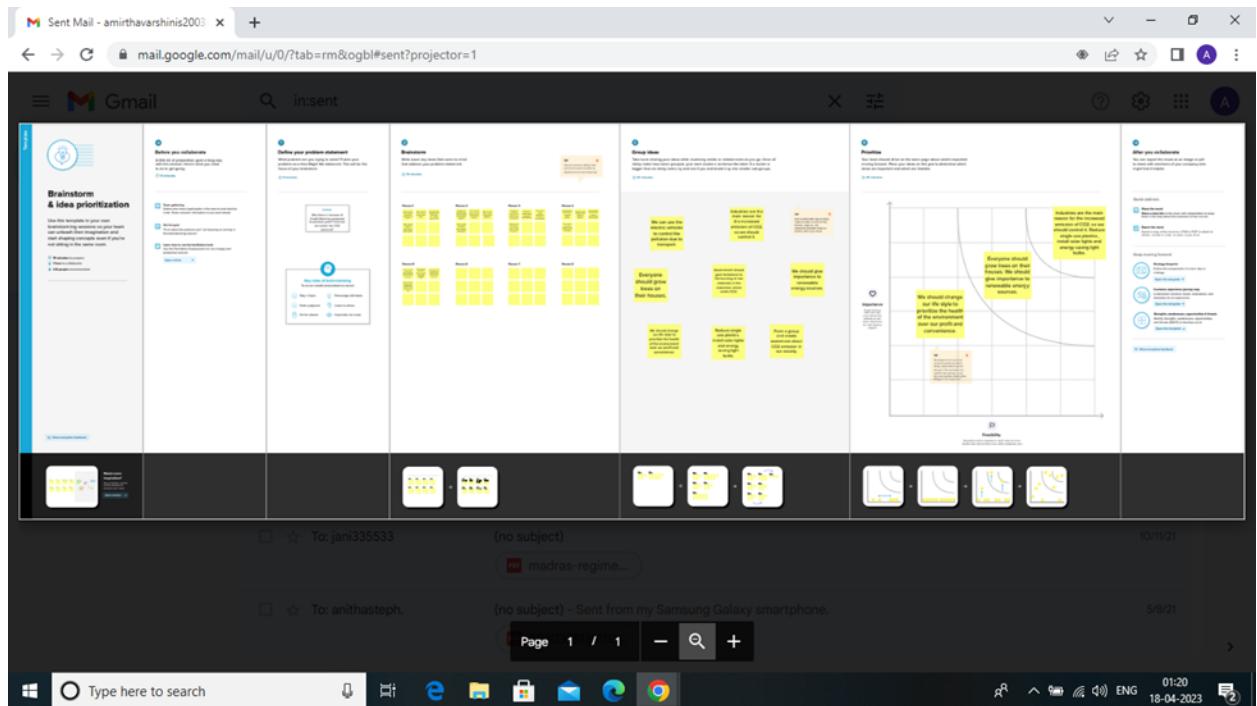
But CO₂ is only good up to a point – beyond that point, Earth's temperature warms up too much.

Problem Definition & Design Thinking

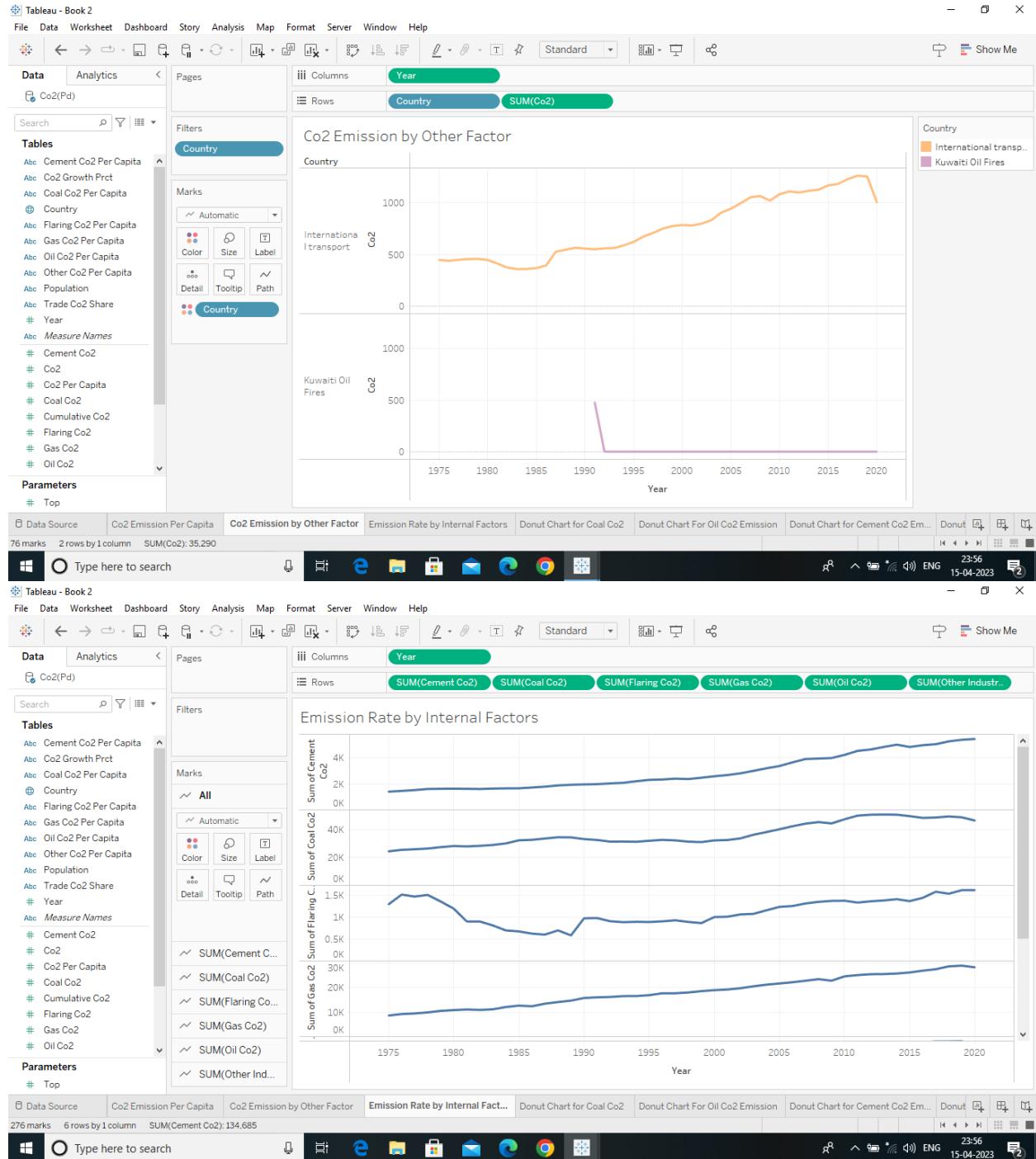
2.1 EMPATHY MAP

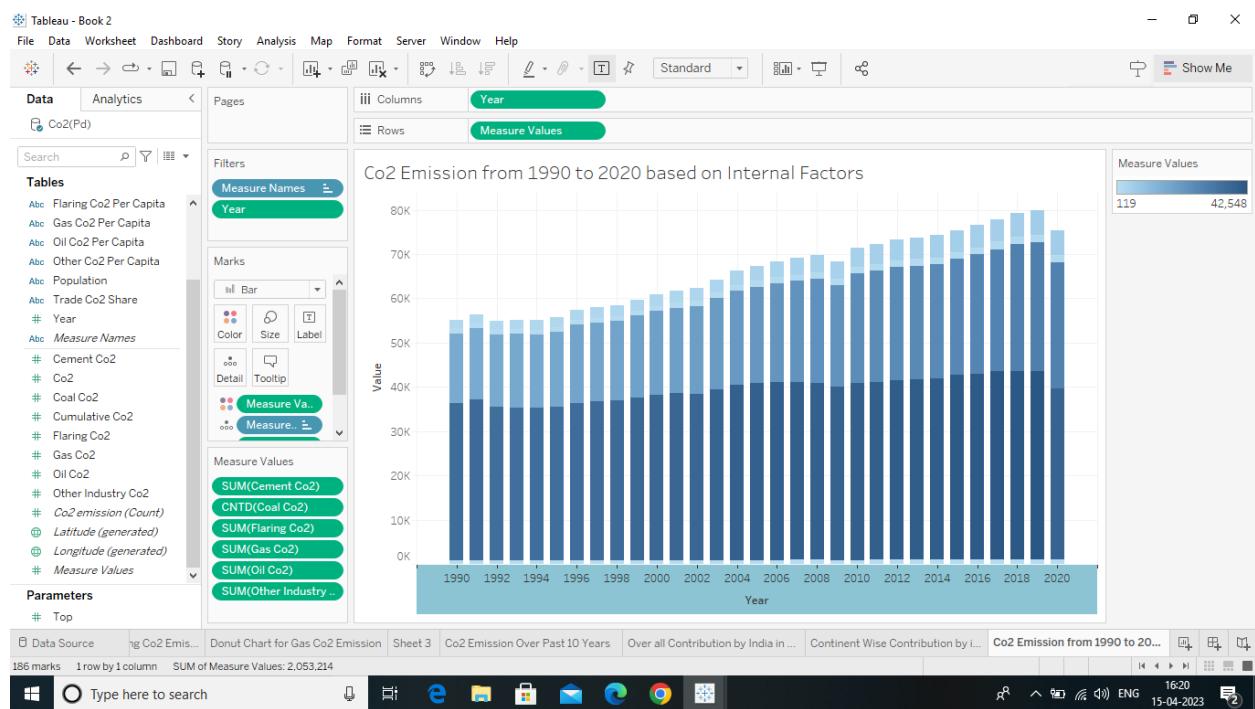
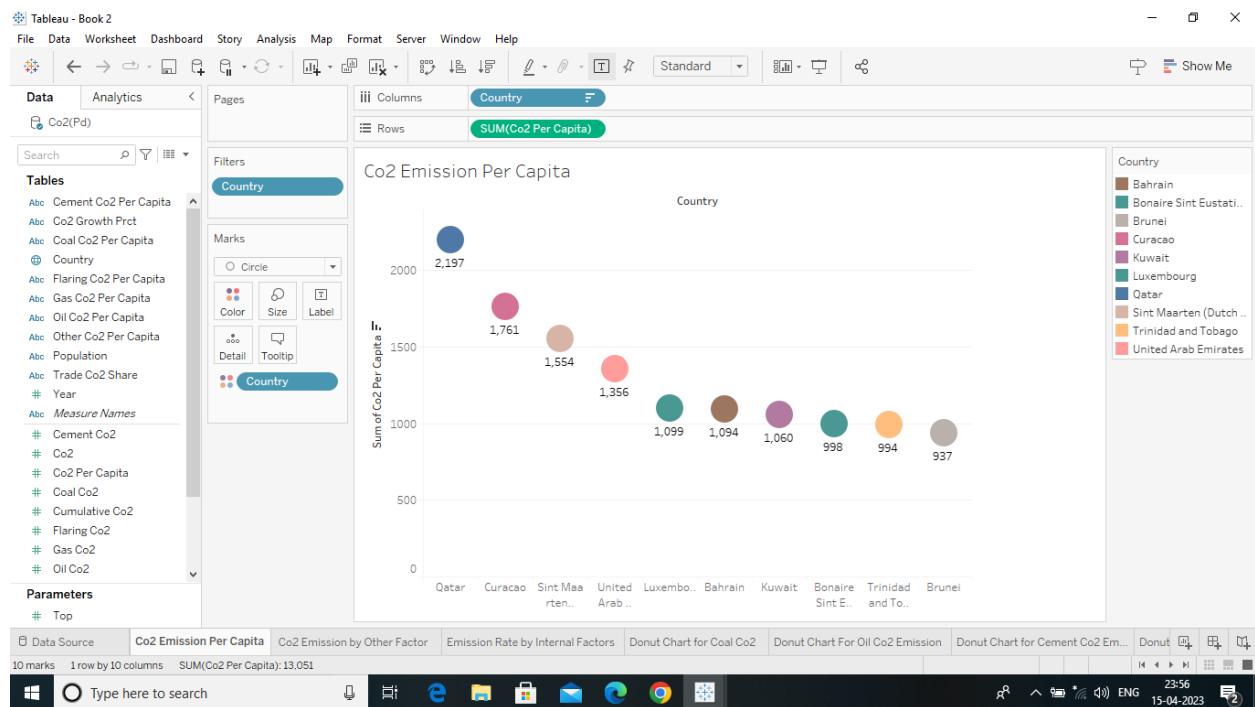


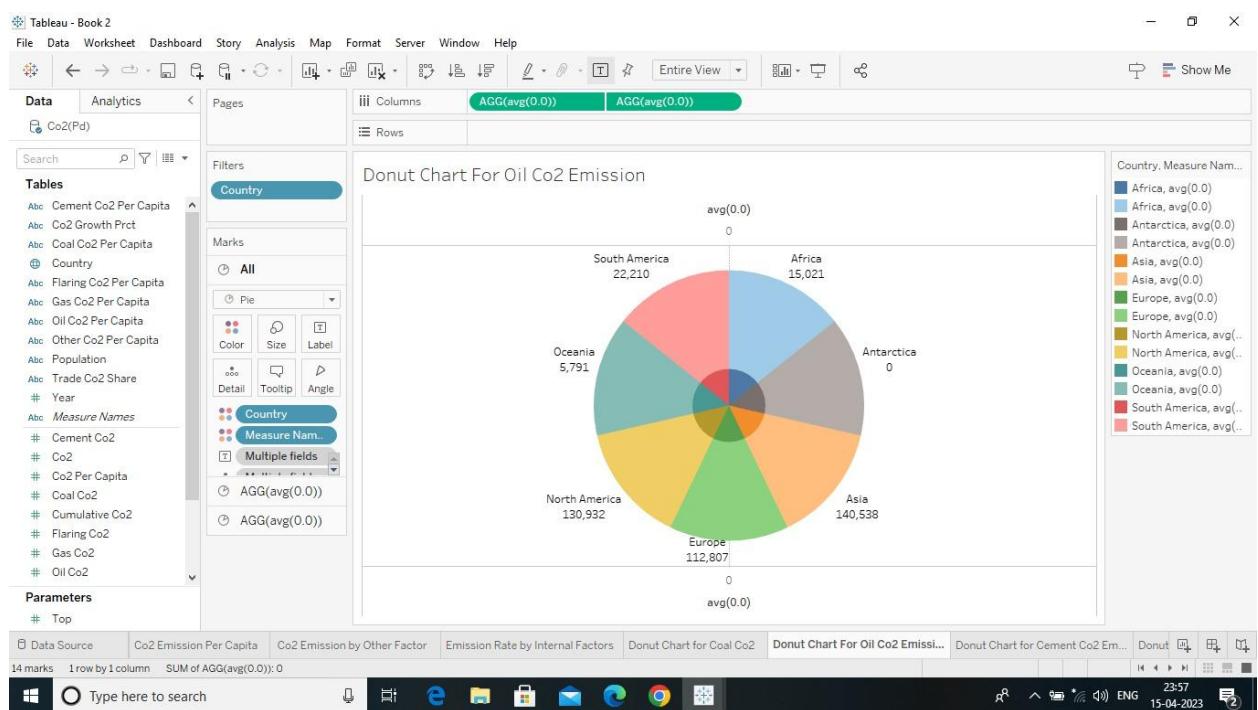
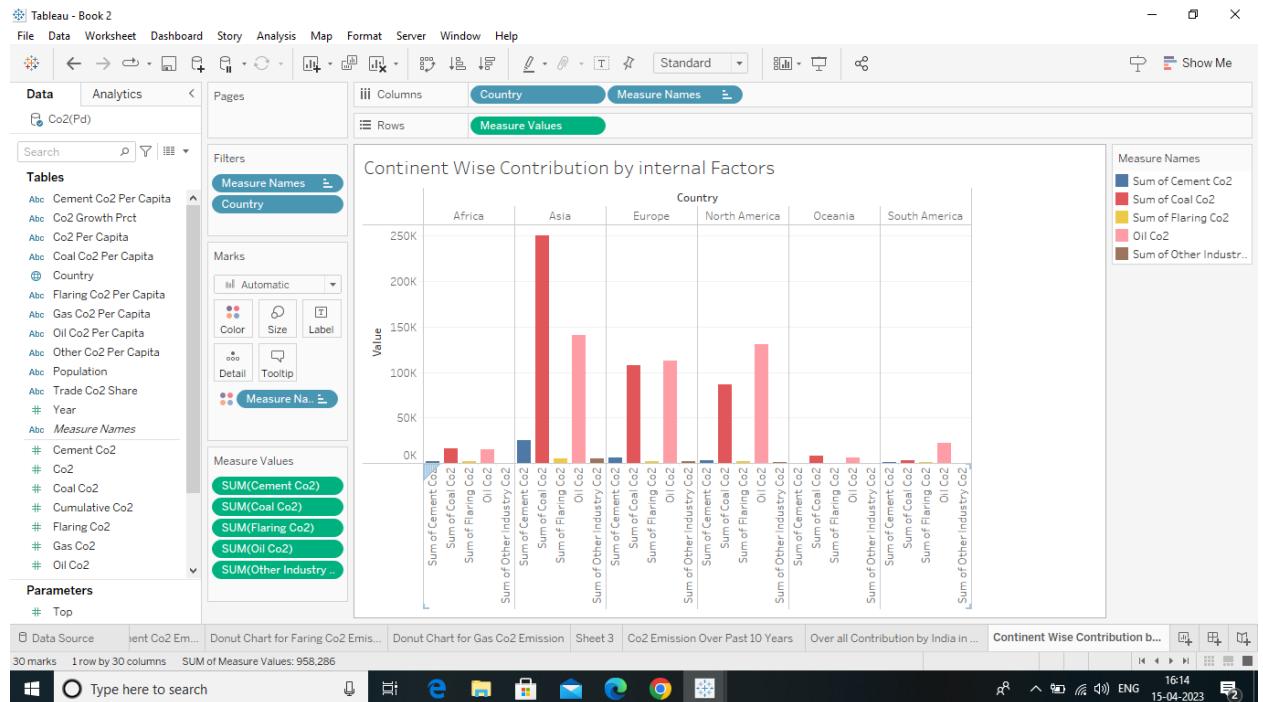
2.2 IDEATION & BRAINSTORMING MAP

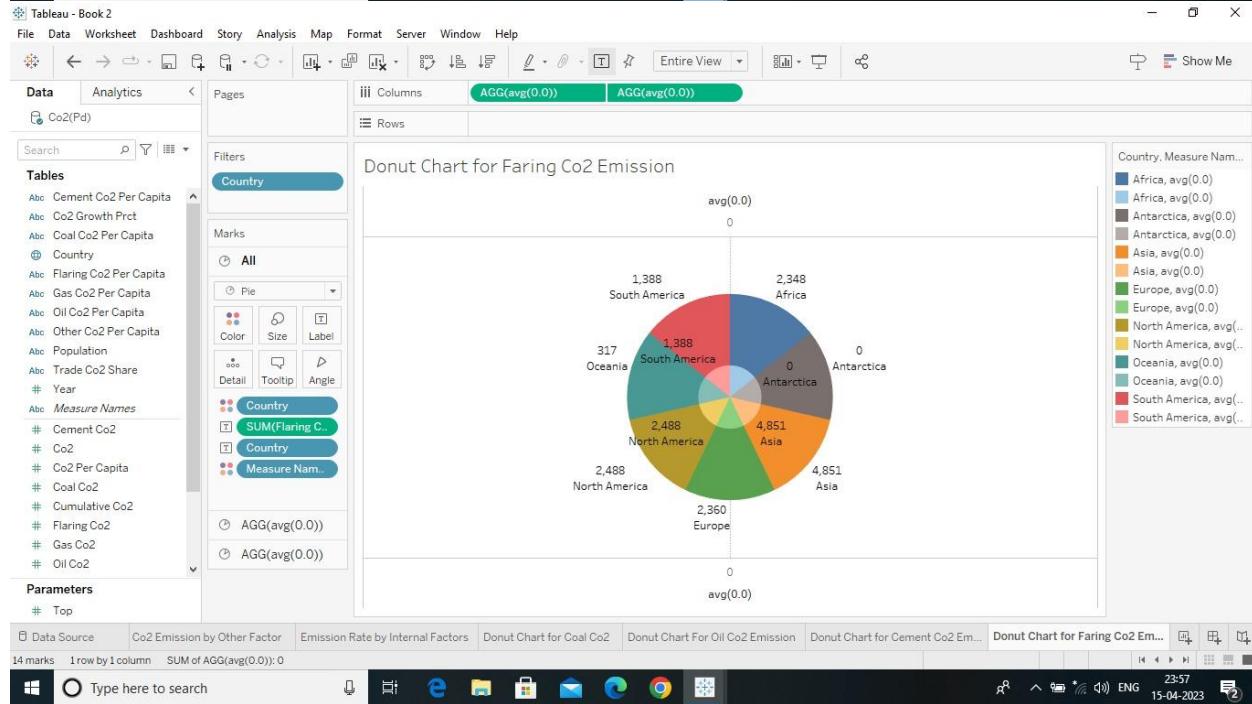
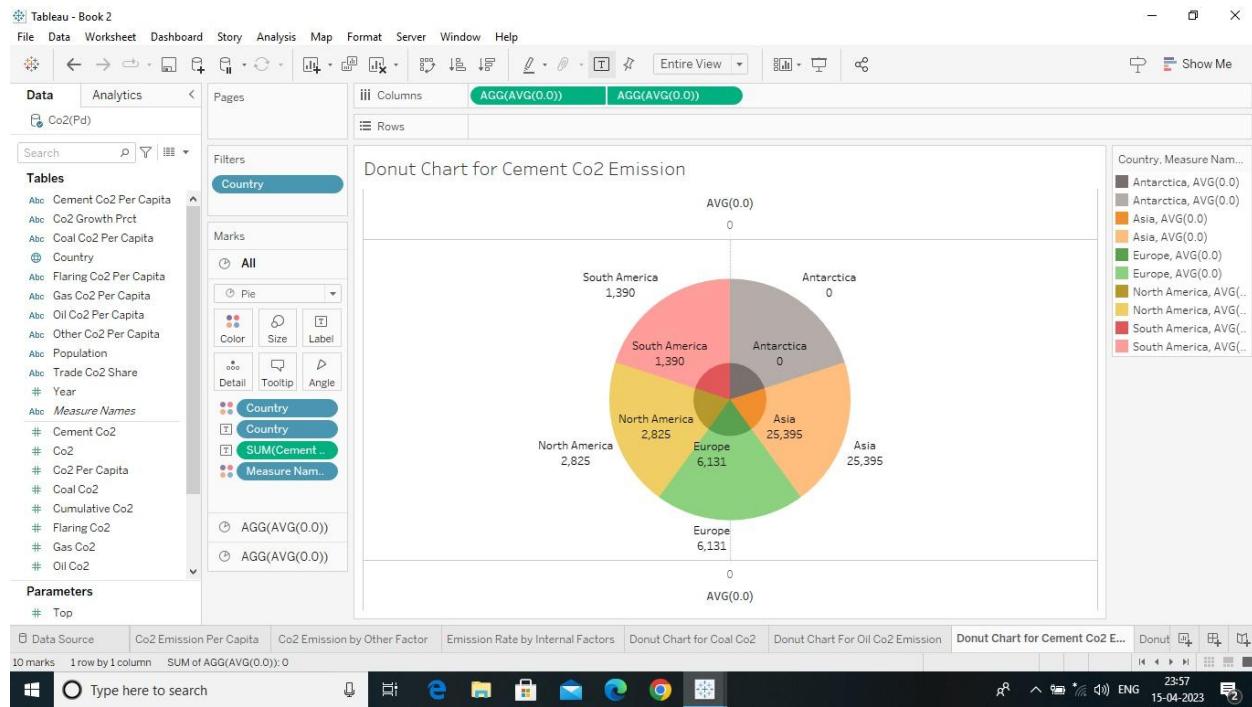


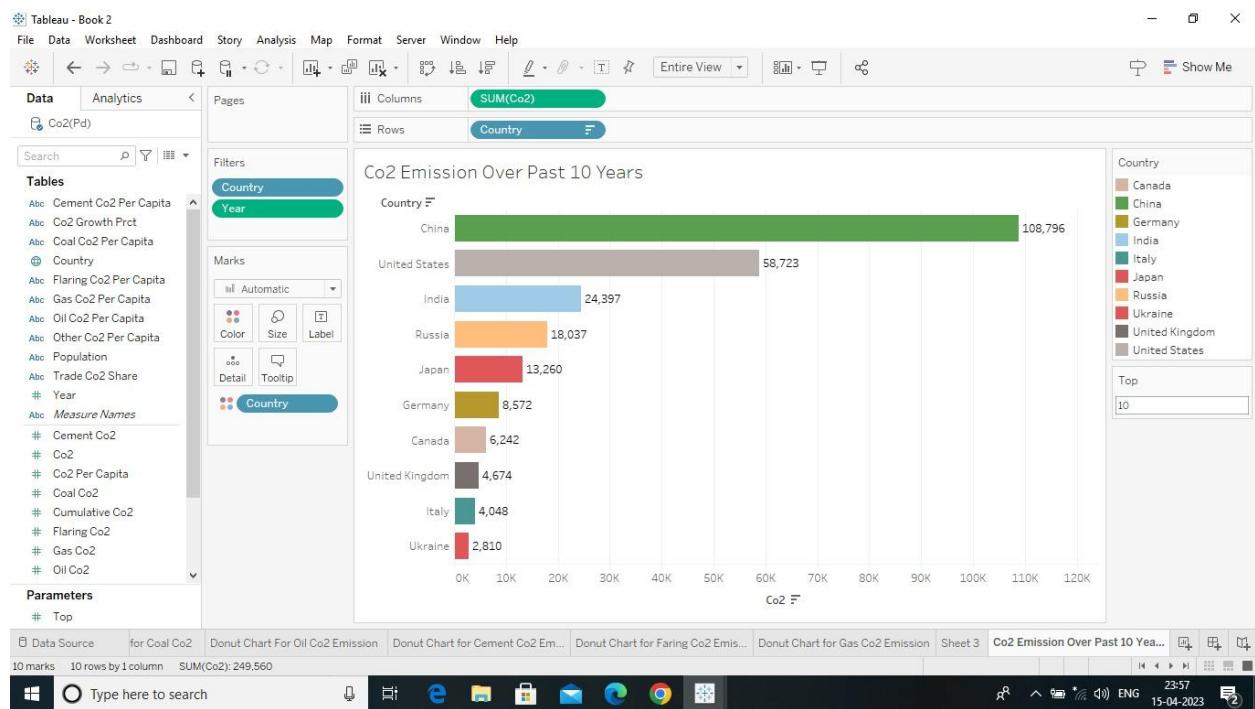
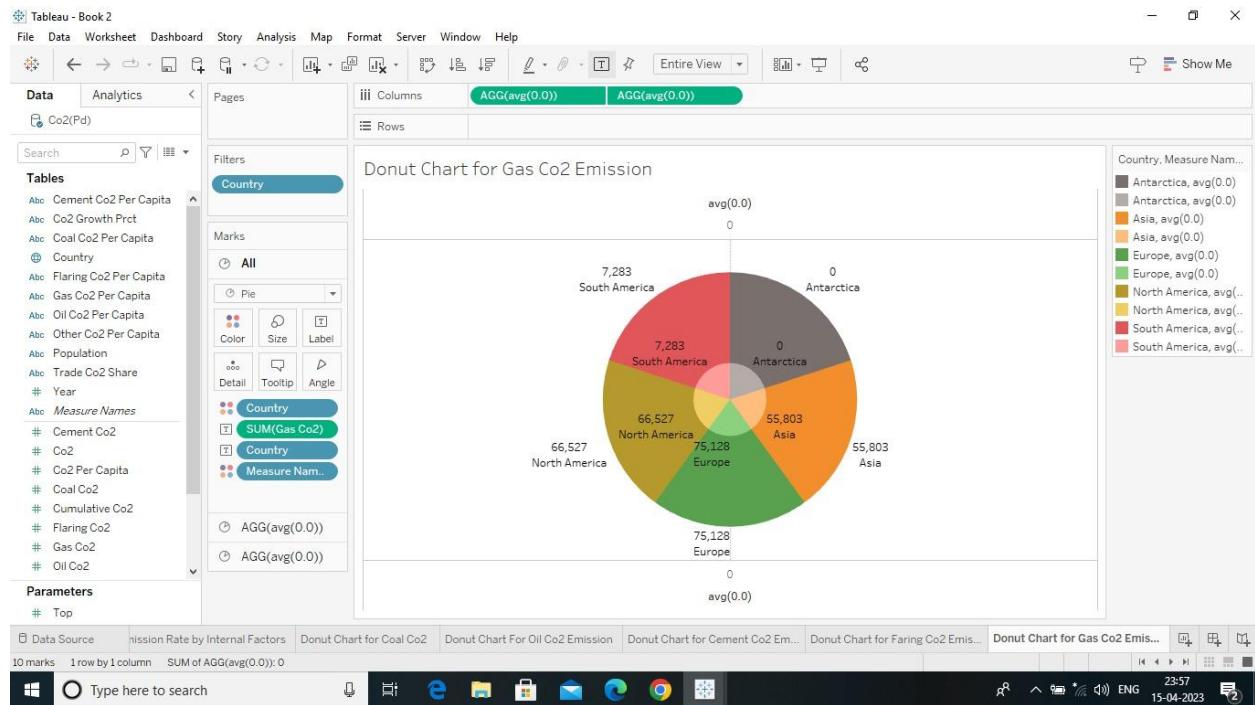
RESULT

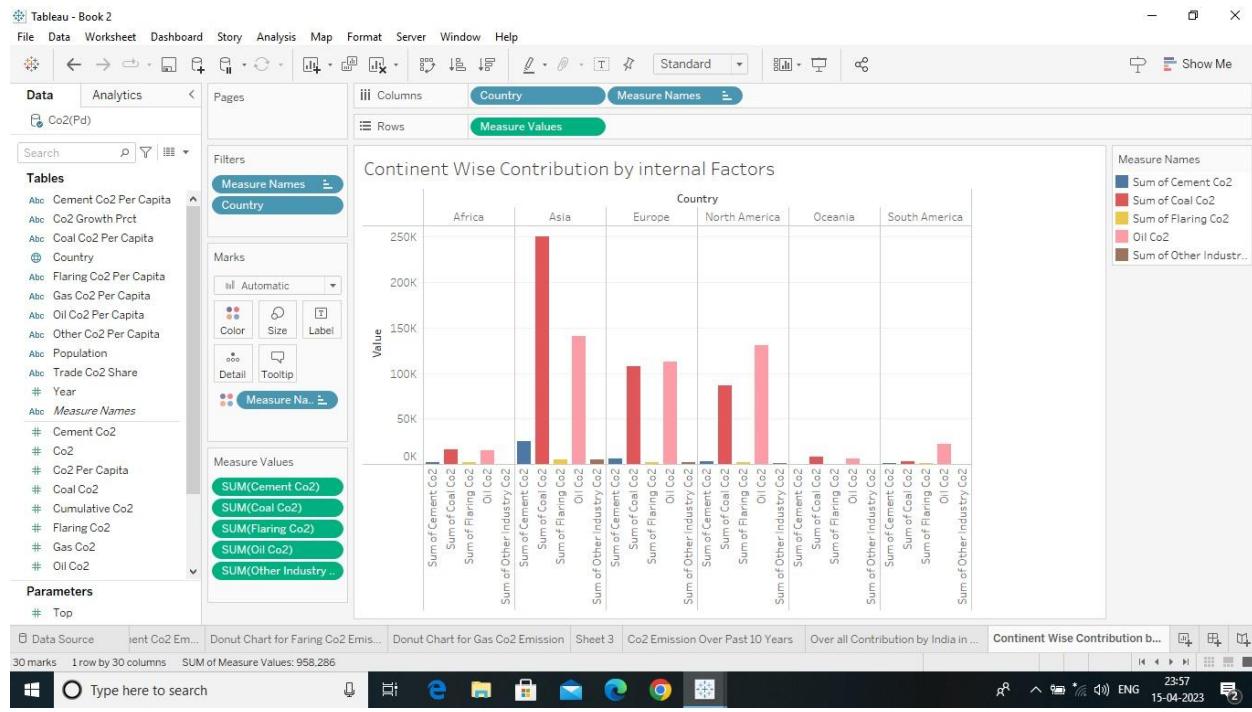
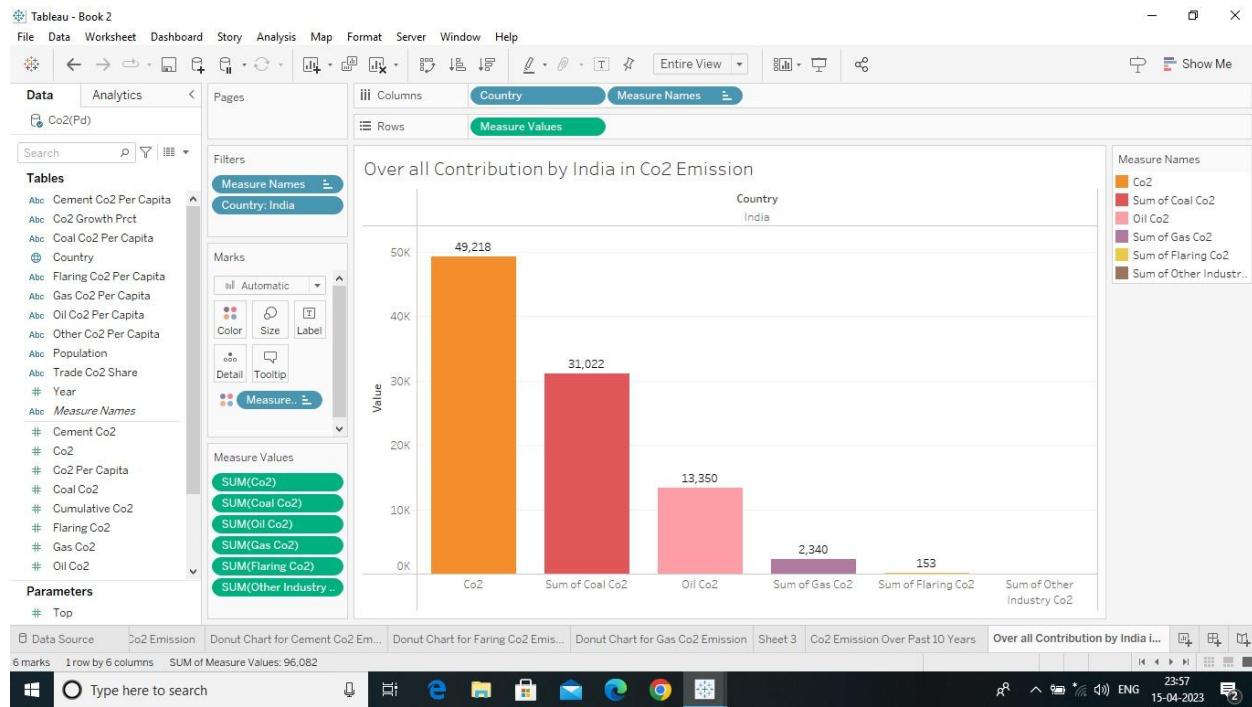


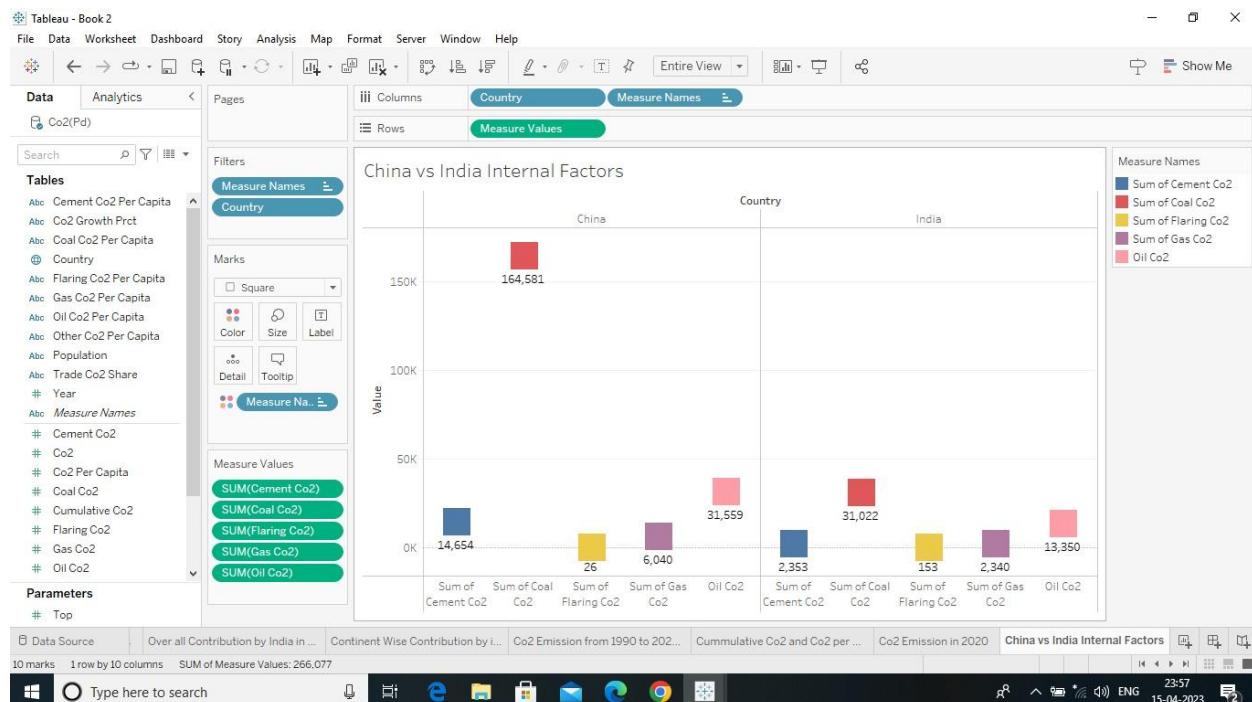
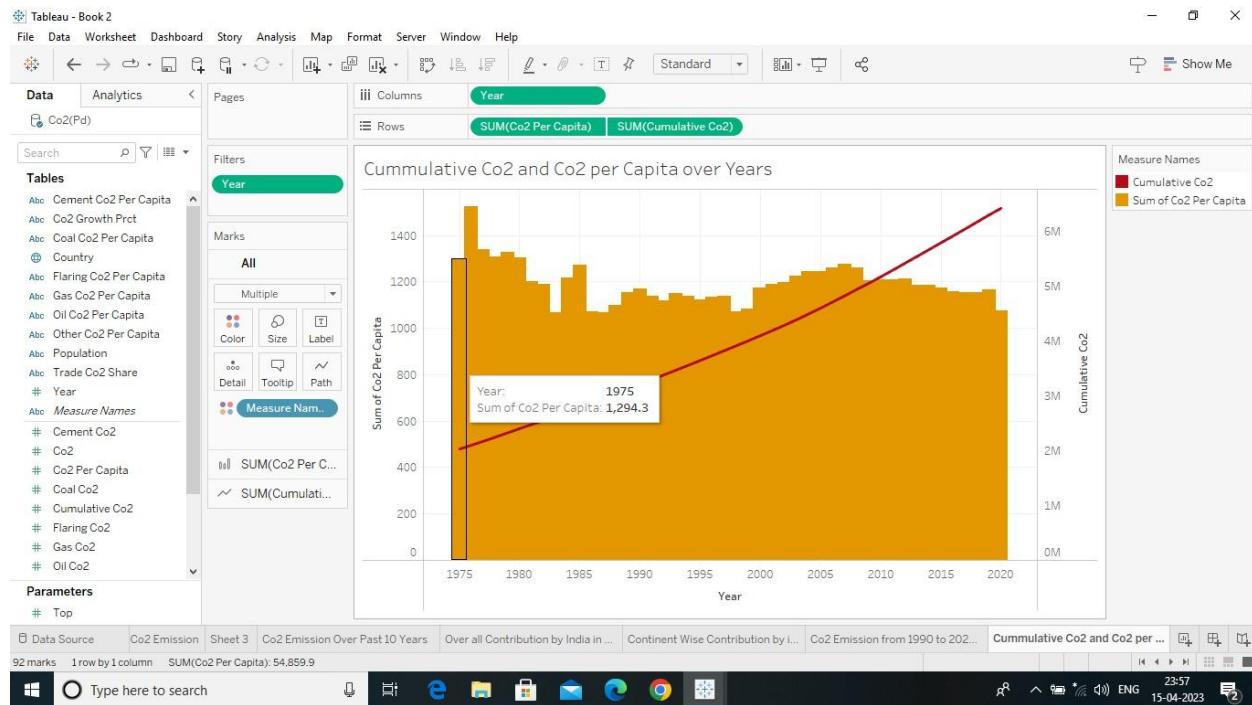


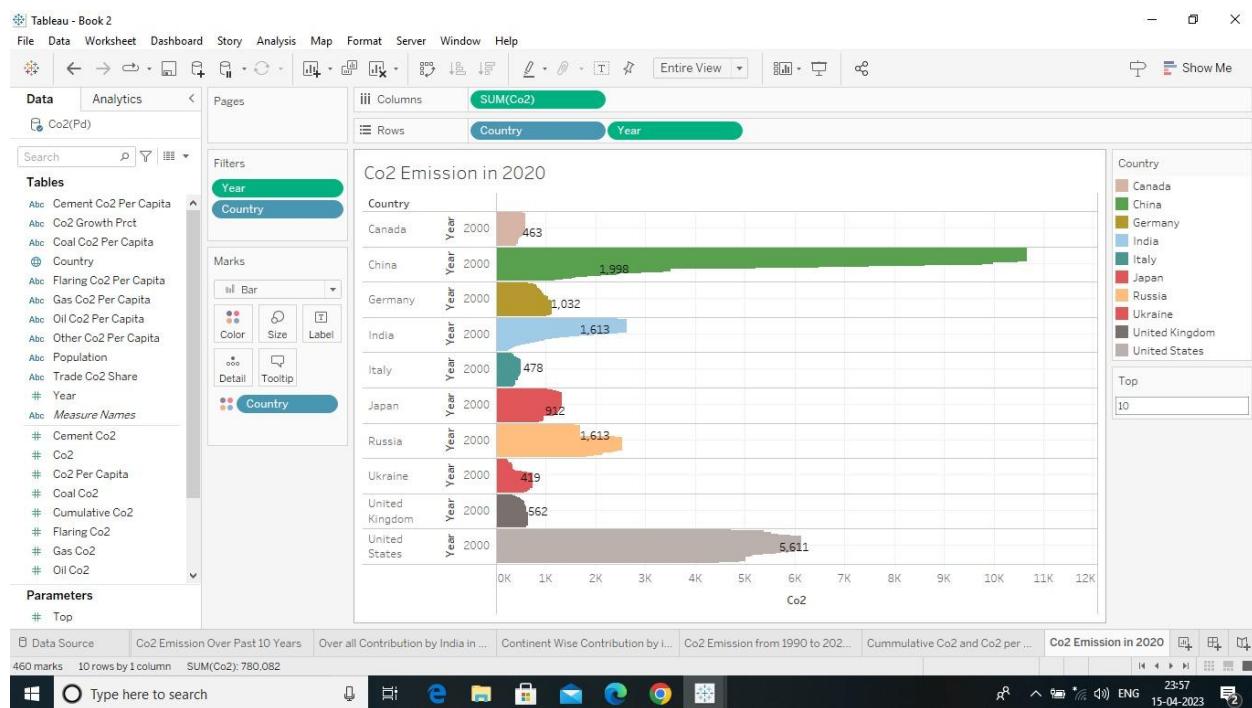
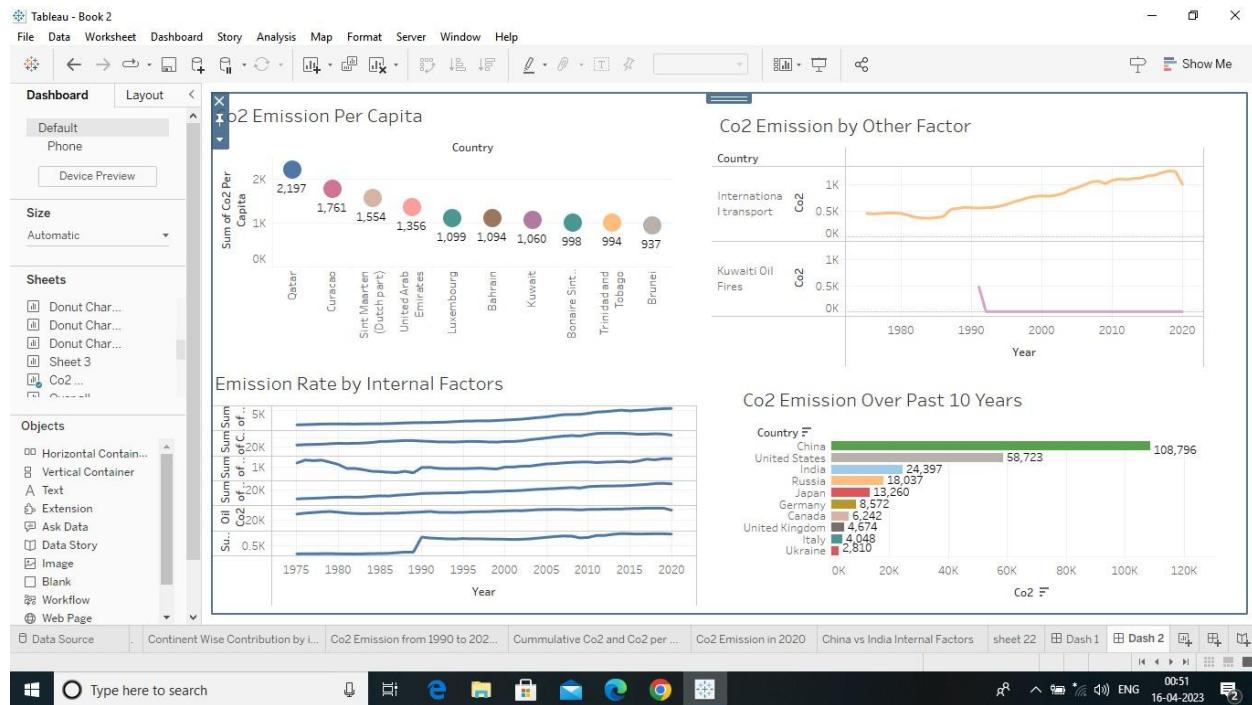










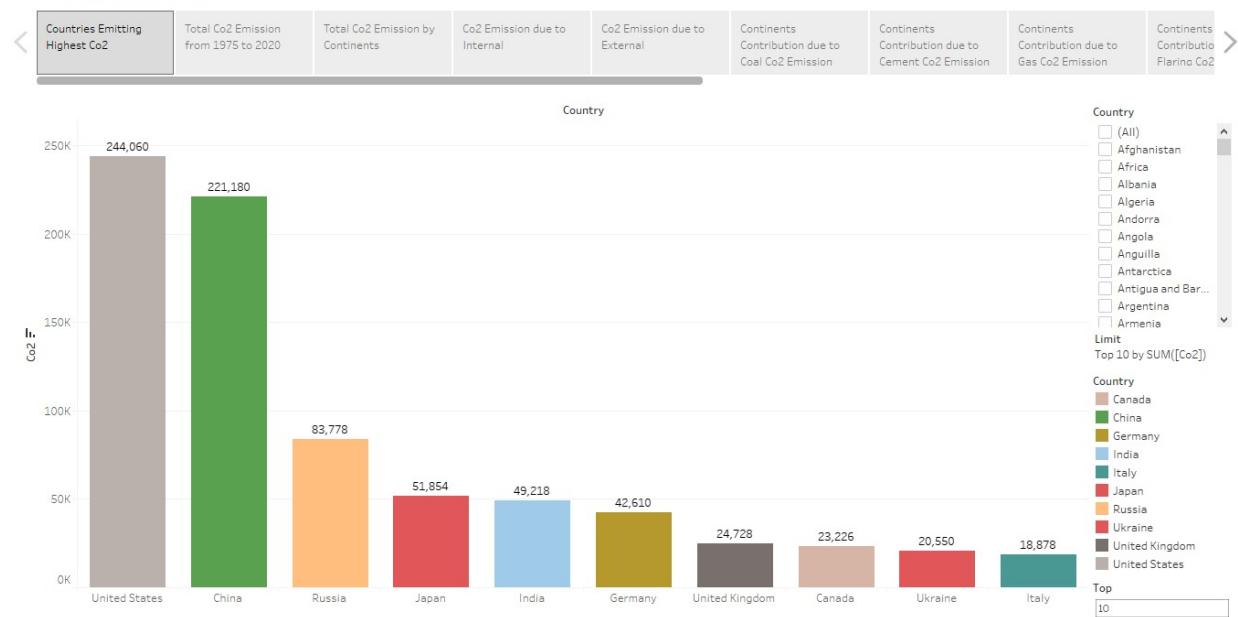


Co2 Emission Story



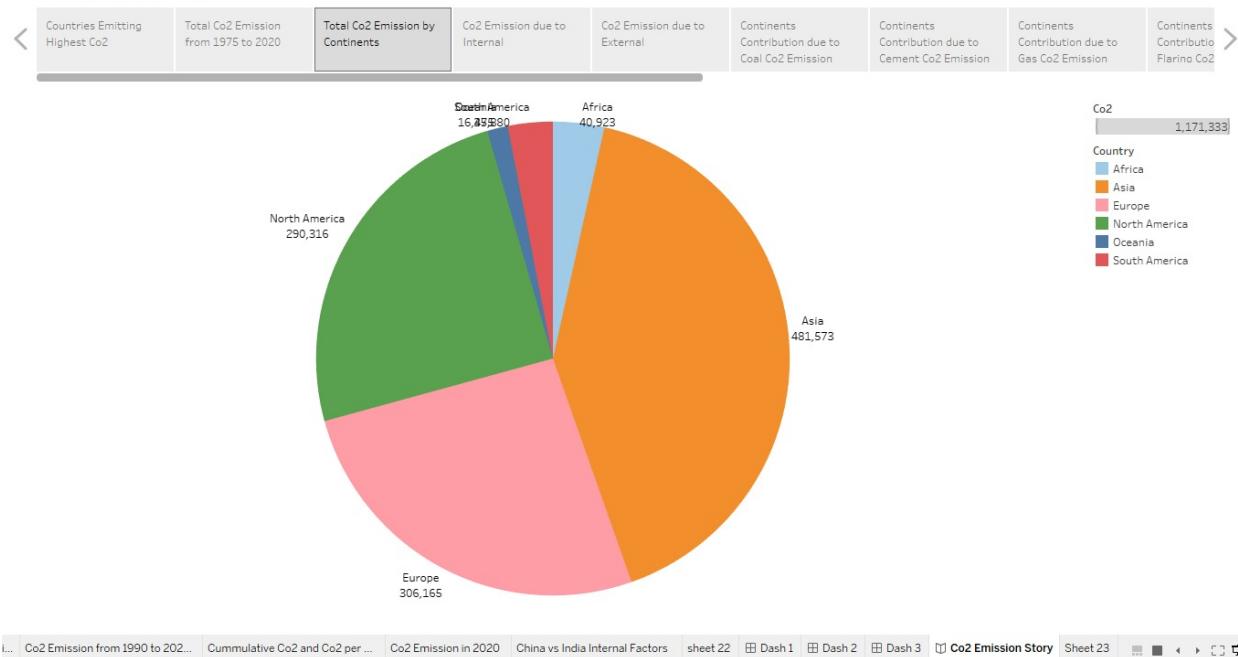
... Co2 Emission from 1990 to 2020 | Cumulative Co2 and Co2 per ... | Co2 Emission in 2020 | China vs India Internal Factors | sheet 22 | Dash 1 | Dash 2 | Dash 3 | Co2 Emission Story | Sheet 23 |

Co2 Emission Story

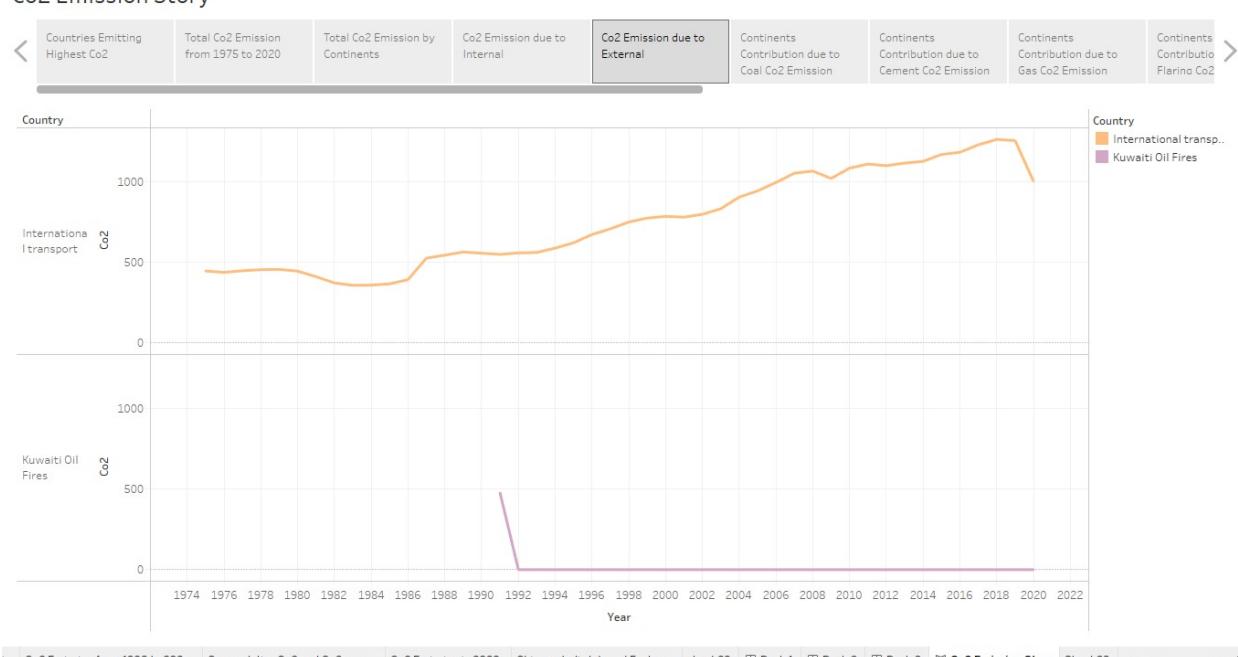


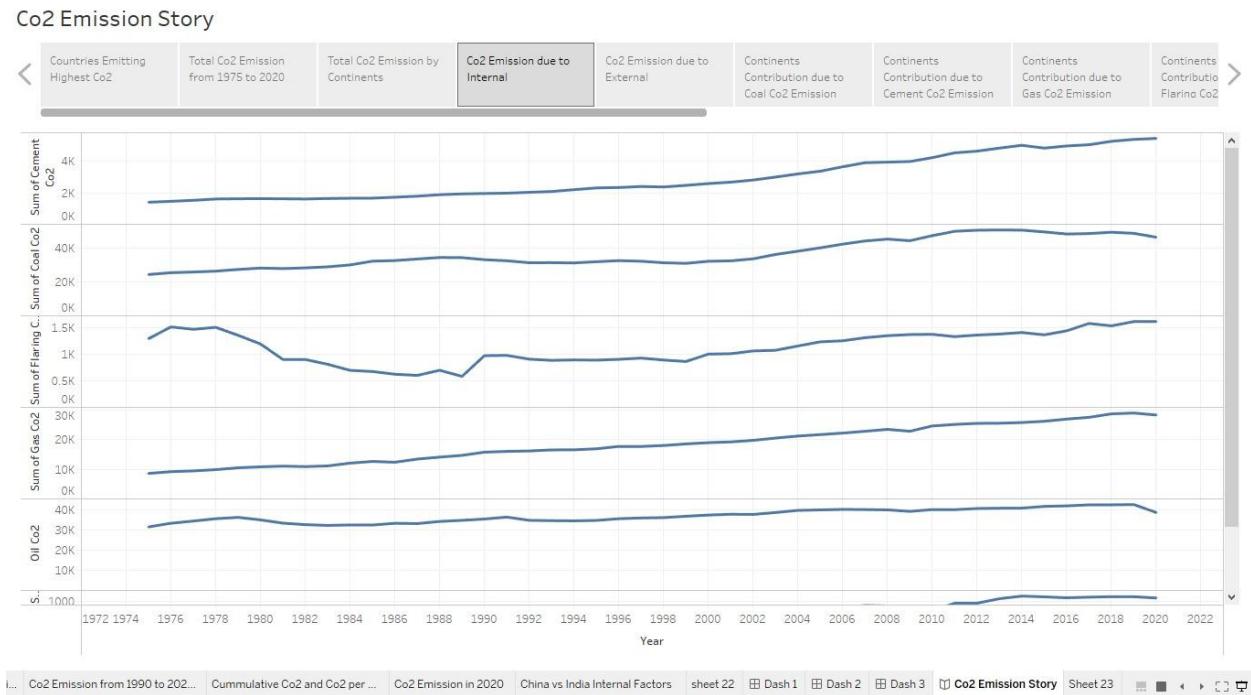
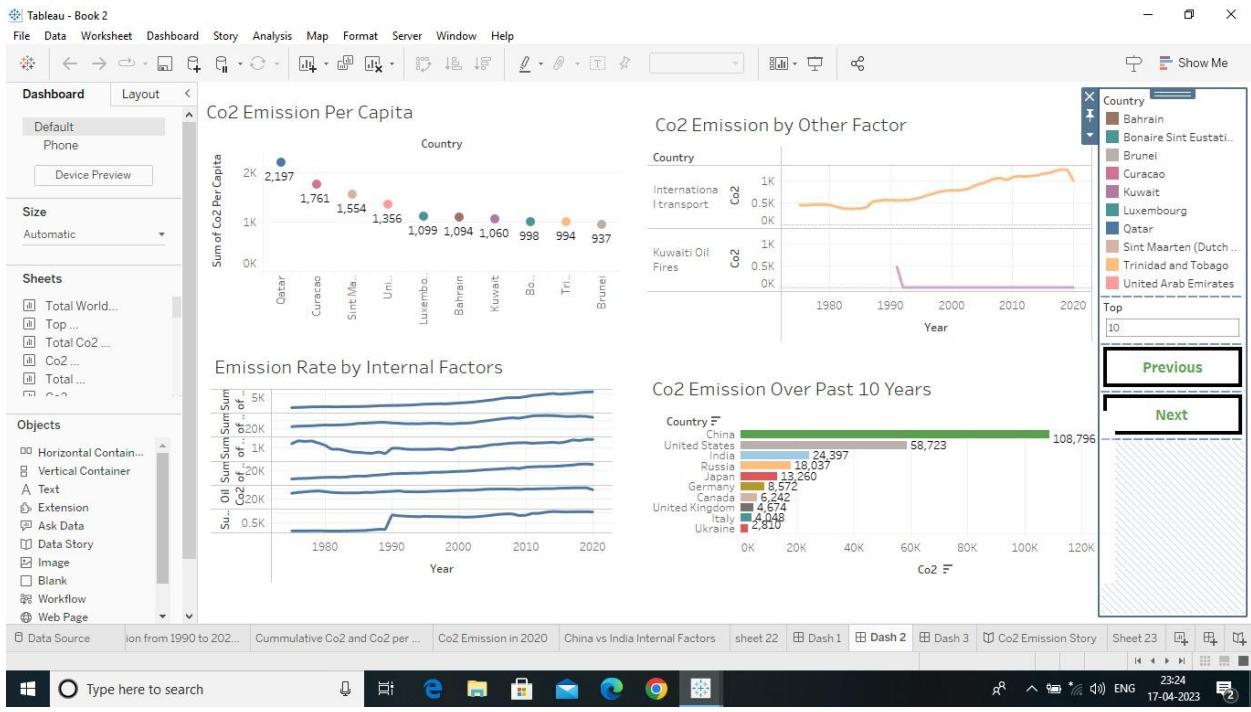
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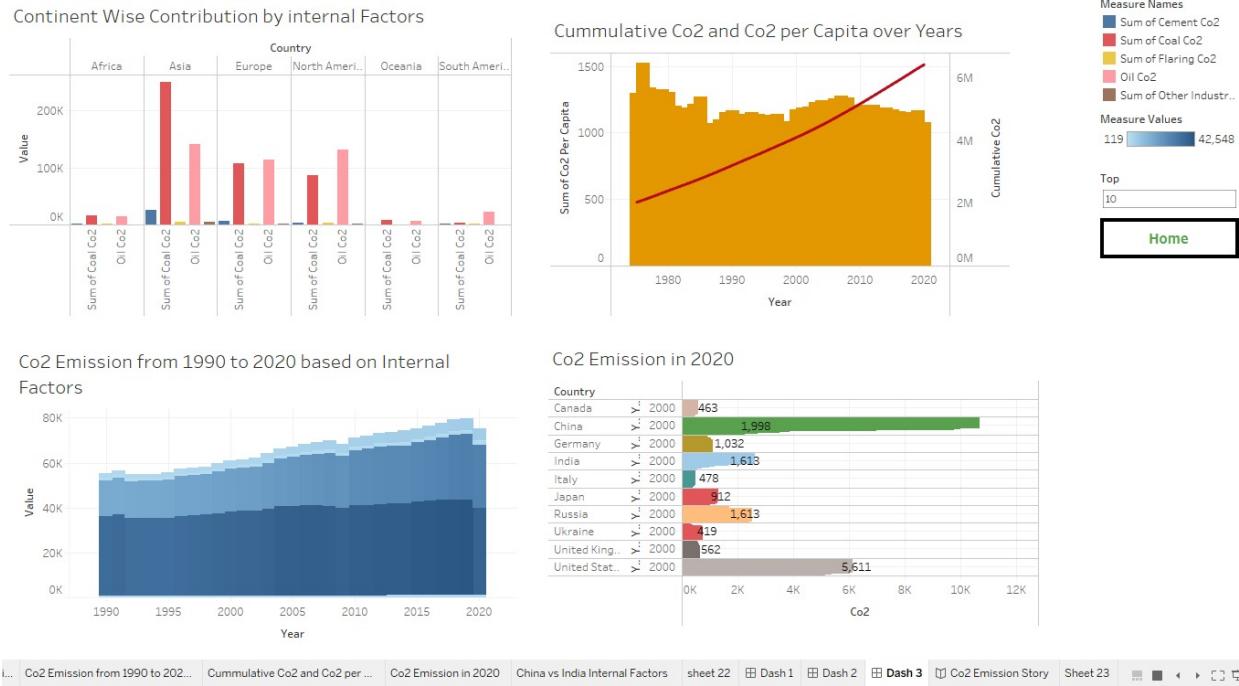
Co2 Emission Story



Co2 Emission Story







... Co2 Emission from 1990 to 2020... Cummulative Co2 and Co2 per ... Co2 Emission in 2020 China vs India Internal Factors sheet 22 Dash 1 Dash 2 Dash 3 Co2 Emission Story Sheet 23

SQLQuery1.sql - AMARNATH\SQLEXPRESS.pd (AMARNATH\ELCOT (57)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

pd

SQLQuery2.sql - A...RNATH\ELCOT (55)*

EXEC sp_help 'dbo.Co2_emission';

Results Messages

Name	Owner	Type	Created_datetime
Co2emission	dbo	user table	2023-04-12 14:31:01.717

Column_name	Type	Computed	Length	Prec	Scale	Nullable	TrimTrailingBlanks	FixedLenNullInSource	Collation
country	nvarchar	no	100			no	(n/a)	(n/a)	SQL_Latin1_General_CI_AS
year	int	no	4	10	0	no	(n/a)	(n/a)	NULL
co2	float	no	8	53	NULL	no	(n/a)	(n/a)	NULL
co2_growth_pct	nvarchar	no	100			no	(n/a)	(n/a)	SQL_Latin1_General_CI_AS
co2_per_capita	nvarchar	no	100			no	(n/a)	(n/a)	SQL_Latin1_General_CI_AS
cumulative_co2	float	no	8	53	NULL	no	(n/a)	(n/a)	NULL
coal_co2	nvarchar	no	100			no	(n/a)	(n/a)	SQL_Latin1_General_CI_AS
cement_co2	nvarchar	no	100			no	(n/a)	(n/a)	SQL_Latin1_General_CI_AS

Identity	Seed	Increment	Not For Replication
1	No identity column defined.	NULL	NULL

RowGuidCol	
1	No rowguidcol column defined.

Data_located_on_filegroup	
1	PRIMARY

Query executed successfully.

AMARNATH\SQLEXPRESS (15.0 RTM) AMARNATH\ELCOT (57) pd 00:00:00 | 24 rows

Ready Type here to search

Ln 1 Col 33 Ch 33 INS

01:01 ENG 18-04-2023

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery2.sql - AMARNATH\SQLEXPRESS.pd (AMARNATH\ELCOT (55)) - Microsoft SQL Server Management Studio". The query window displays the following SQL command:

```
USE pd
SELECT * FROM INFORMATION_SCHEMA.COLUMNS
```

The results grid shows 40 rows of data from the INFORMATION_SCHEMA.COLUMNS table. The columns and their values are as follows:

	TABLE_CATALOG	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	ORDINAL_POSITION	COLUMN_DEFAULT	IS_NULLABLE	DATA_TYPE	CHARACTER_MAXIMUM_LENGTH	CHARACTER_OCTET_LENGTH
1	pd	dbo	Co2	country	1	NULL	NO	nvarchar	50	100
2	pd	dbo	Co2	year	2	NULL	NO	int	NULL	NULL
3	pd	dbo	Co2	co2	3	NULL	NO	float	NULL	NULL
4	pd	dbo	Co2	co2_growth_pct	4	NULL	NO	nvarchar	50	100
5	pd	dbo	Co2	co2_per_capita	5	NULL	NO	nvarchar	50	100
6	pd	dbo	Co2	cumulative_co2	6	NULL	NO	float	NULL	NULL
7	pd	dbo	Co2	coal_co2	7	NULL	NO	nvarchar	50	100
8	pd	dbo	Co2	cement_co2	8	NULL	NO	nvarchar	50	100
9	pd	dbo	Co2	flaring_co2	9	NULL	NO	nvarchar	50	100
10	pd	dbo	Co2	gas_co2	10	NULL	NO	nvarchar	50	100
11	pd	dbo	Co2	oil_co2	11	NULL	NO	float	NULL	NULL
12	pd	dbo	Co2	other_industry_co2	12	NULL	NO	nvarchar	50	100
13	pd	dbo	Co2	cement_co2_per_ca...	13	NULL	NO	nvarchar	50	100
14	pd	dbo	Co2	coal_co2_per_ca...	14	NULL	NO	nvarchar	50	100
15	pd	dbo	Co2	flaring_co2_per_ca...	15	NULL	NO	nvarchar	50	100
16	pd	dbo	Co2	gas_co2_per_ca...	16	NULL	NO	nvarchar	50	100
17	pd	dbo	Co2	oil_co2_per_ca...	17	NULL	NO	nvarchar	50	100
18	pd	dbo	Co2	other_co2_per_ca...	18	NULL	NO	nvarchar	50	100
19	pd	dbo	Co2	trade_co2_share	19	NULL	NO	nvarchar	50	100
20	pd	dbo	Co2	population	20	NULL	NO	nvarchar	50	100
21	pd	dbo	Co2 emission	country	1	NULL	NO	nvarchar	50	100
22	pd	dbo	Co2 emission	year	2	NULL	NO	int	NULL	NULL
23	pd	dbo	Co2 emission	co2	3	NULL	NO	float	NULL	NULL

At the bottom of the screen, the taskbar shows the Windows Start button, a search bar, and various pinned icons like File Explorer, Edge, Mail, and File Explorer. The system tray indicates the date as 18-04-2023 and the time as 01:00.

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.

Carbon dioxide is essential for internal respiration in a human body.

Internal respiration is a process, by which oxygen is transported to body tissues and carbon dioxide is carried away from them.

Carbon dioxide is a guardian of the pH of the blood, which is essential for survival.

Disadvantages

Carbon emissions are one type of greenhouse gas emission that happens when carbon dioxide enters the air after a human activity or process.

According to National Geographic, carbon dioxide is considered a pollutant, though we may more readily associate “pollution” with things like smoke or plastic floating in a lake.

But pollutants are anything that falls under the umbrella of a mix of particles and gases that have the capacity to reach harmful concentrations, according to National Geographic.

Things like soot, smoke, mold, and pollen are considered pollutants, but greenhouse gases like methane and carbon dioxide are, too.

Causes of CO₂ emissions

Scientists agree that human activities have been the primary source for the observed rise in atmospheric carbon dioxide since the beginning of the fossil fuel era in the 1860s. Eighty-five percent of all human-produced carbon dioxide emissions come from the burning of fossil fuels like coal, natural gas and oil, including gasoline. The remainder results from the clearing of forests and other land use, as well as some industrial processes such as cement manufacturing. The use of fossil fuels has grown rapidly, especially since the end of World War II and continues to increase exponentially. In fact, more than half of all fossil fuels ever used by humans have been consumed in just the last 20 years.

Human activities add a worldwide average of almost 1.4 metric tons of carbon per person per year to the atmosphere. Before industrialization, the concentration of carbon dioxide in the atmosphere was about 280 parts per million. By 1958, the concentration of carbon dioxide had increased to around 315 parts per million, and by 2007, it had risen to about 383 parts per million. These increases were due almost entirely to human activity.

While we are able to accurately measure the amount of carbon dioxide in the atmosphere, much about the processes that govern its atmospheric concentration remains a mystery. Scientists still do not know precisely where all the carbon dioxide in our atmosphere comes from and where it goes. They want to learn more about the magnitudes and distributions of carbon dioxide's sources and the places it is absorbed (sinks). This knowledge will help improve critical forecasts of atmospheric carbon dioxide increases as fossil fuel use and other human activities continue. Such information is crucial to understanding the impact of human activities on climate and for evaluating options for mitigating or adapting to climate change.

Plant life and geochemical processes on land and in the ocean 'inhale' large amounts of carbon dioxide through photosynthesis and then 'exhale' most of it back into the atmosphere," Marland continued. "Humans, however, have altered the carbon cycle over the last couple of centuries, through the burning of fossil fuels that enable us to live more productively. Now that

humans are acknowledging the environmental effects of our dependence on fossil fuels and other carbon dioxide-emitting activities, our goal is to analyze the sources and sinks of this carbon dioxide and to find better ways to manage it."

There are both natural and human sources of carbon dioxide emissions. Natural sources include decomposition, ocean release and respiration. Human sources come from activities like cement production, deforestation as well as the burning of fossil fuels like coal, oil and natural gas.

Conclusion

To achieve the two-degree target with a probability of around 70%, it is estimated that global greenhouse gas emissions need to decrease by 50-60% from 2000 to 2050, and by almost 100% by 2100. To achieve a 1.5-degree target with a probability of around 70%, zero emissions are needed globally as early as 2050.

Carbon capture and sequestration is an attractive option for reducing greenhouse gas emissions and could even help remove carbon dioxide from the atmosphere.

We can use Super critical Carbon dioxide to reduce pollution as they are eco friendly.

FUTURE SCOPE

Since the Industrial Revolution, humans have emitted more than 2,000 gigatons of carbon dioxide into the atmosphere. (A gigaton is one billion metric tons.)

This concentration of CO₂ and other greenhouse gases in the air causes the climate change impacts we're experiencing today, from forest fires to stifling heat waves and damaging sea level rise — and the global community is still emitting more each year. Unless we make serious changes, climate impacts will only continue to intensify.

The latest climate model scenarios show that all pathways that keep temperature rise to 1.5 degrees C (with little or no overshoot) require carbon removal.

Here are six options for removing carbon from the atmosphere:

1) Trees and Forests

Plants remove carbon dioxide from the air naturally, and trees are especially good at storing CO₂ removed from the atmosphere by photosynthesis.

2) Farms and Soils

Soils naturally sequester carbon, but agricultural soils are running a big deficit due to frequent plowing and erosion from farming and grazing, all of which release stored carbon.

Because agricultural land is so expansive — encompassing more than 900 million acres in the United States alone, or approximately 40% of the country's land area — even small increases in soil carbon per acre could be impactful.

3) Biomass Carbon Removal and Storage

Biomass carbon removal and storage (BiCRS) includes a range of processes that use biomass from plants or algae to remove carbon dioxide from the air and then store it for long periods of time.

4) Direct Air Capture

Direct air capture is the process of chemically scrubbing carbon dioxide from the ambient air and then sequestering it either underground or in long-lived products like concrete.

5) Carbon Mineralization

Some minerals naturally react with CO₂, turning carbon dioxide from a gas into a solid and keeping it out of the atmosphere permanently. This process is commonly referred to as “carbon mineralization” or “enhanced weathering,” and it naturally happens very slowly, over hundreds or thousands of years.

6) Ocean-based Approaches

A number of ocean-based carbon removal approaches have been proposed to leverage the ocean’s capacity to sequester carbon and expand the portfolio of options beyond land-based applications.