



AWARING PEOPLE ABOUT CARBON FOOTPRINTS.

A Report Submitted for Partial Fulfillment of
Course:-

Project Based Learning

First Year Engineering Program of SPPU, Semester-II
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CERTIFICATE

This is to certify that, report “**AWARING THE PEOPLE ABOUT CARBON FOOTPRINT**” submitted by Siddhant Sonawane, Kaif Mirza, Shubham Sonawane, Nikhil Selvaraj, Prathamesh Dhanwanjewar, Yash Mahajan of First Year Engineering Program, is bonafide work completed in partial fulfillment of course **Project Based Learning**.

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SYNOPSIS:-

TO AWARE PEOPLE ABOUT CARBON FOOTPRINT

Introduction:

The carbon footprint is a very important means to understand the impact of a person's behavior on global warming. This is why someone who effectively wants to contribute to stopping global warming, at least on an individual scale, needs to measure and keep track of their personal carbon footprint.

A carbon footprint corresponds to the whole amount of greenhouse gases (GHG) produced to, directly and indirectly, support a person's lifestyle and activities. Carbon footprints are usually measured in equivalent tons of CO₂, during the period of a year, and they can be associated with an individual, an organization, a product or an event, among others.

The results in a carbon footprint can come from the production and consumption of fossil fuels, food, manufactured goods, materials, roads or transportation. And despite its importance, carbon footprints are difficult to calculate exactly due to poor knowledge and short data regarding the complex interactions between contributing processes like the influence of natural processes that store or release carbon dioxide.

Methodology :

Step 1- Data collection

1. Electricity: Collect data on your annual electricity bills. You can find the number of power units (In India, one unit = 1KWh of electricity) consumed in your home from the monthly electricity bills issued by State Electricity Board/ Distribution/Collection companies. Take monthly consumed units and then multiply them by 12 (No of months in a year). A car/motorcycle in a year. If you do not remember the exact value right now, please add average values.
2. LPG: Generally one LPG cylinder has around 14 kg of liquefied petroleum gas. Multiply the number of cylinders used in a year by 14 and add the resulted value in the calculation.

Step 2 – Calculation Methodology

1. Electricity: Input value (in KWh/Yr.) X 0.85 (Emission Factor) = Output value in (Kg of CO₂)
2. Petrol: Input Value (In Liters/Yr.) X 2.296(Emission Factor) = Output value in (Kg of CO₂)
3. Diesel: Input Value (In Liters/Yr.) X 2.653 (Emission Factor) = Output value in (Kg of CO₂)
4. LPG: Input Value (In Kg/Yr.) X 2.983 (Emission Factor) = Output value in (Kg of CO₂)
5. **Your Carbon Footprint** : Add (1+2+3+4) = Output value in (Kg of CO₂)

Divide final value (no 5) with 1000 so that you get a total carbon footprint in a ton of CO₂.

The final Carbon footprint should be in tons of CO₂ (tCO₂).

Outcome:

- 1) Air pollution: Reducing the carbon emissions would decrease the number of deaths related to air pollution and help to ease pressure on healthcare systems.
- 2) Cost saving: When it comes to cost savings, the simple reduction of energy usage both shrinks your organizational carbon footprints and your operating expenses themselves.

Conclusion:

The goal of this project has been to help people understand, calculate and shrink their carbon footprints. Whether your aim is to reduce your footprints by one tone, or to shrink it to one tone, this guide should be full of useful information.

If you make a serious effort to shrink your own carbon footprints you will be confronted with a number of challenges. Meeting your housing, travel, food, product and services. Footprints on a strict carbon budget is not easy, but this challenge is exactly what we must do both individually and collectively in order to limit the risk of climate change.

Future Scope:

We can create one software (website), that will calculate our individual carbon footprints and if one's carbon footprints is greater than the average value (4 tone) then it will give some solutions that we can perform in our day to day life to reduce carbon emissions

Reference:

<https://youmatter.world/en/definition/definitions-carbon-footprint/>

<https://greencleanguide.com/calculate-your-carbon-footprint/>

<https://ourworldindata.org/emissions-by-sector>

https://www.downtoearth.org.in/dte-infographics/61005_emission_cities_india.html

Team name: **THE DOMINATORS**

Group no: 03

Members:

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- Siddhant Sonawane
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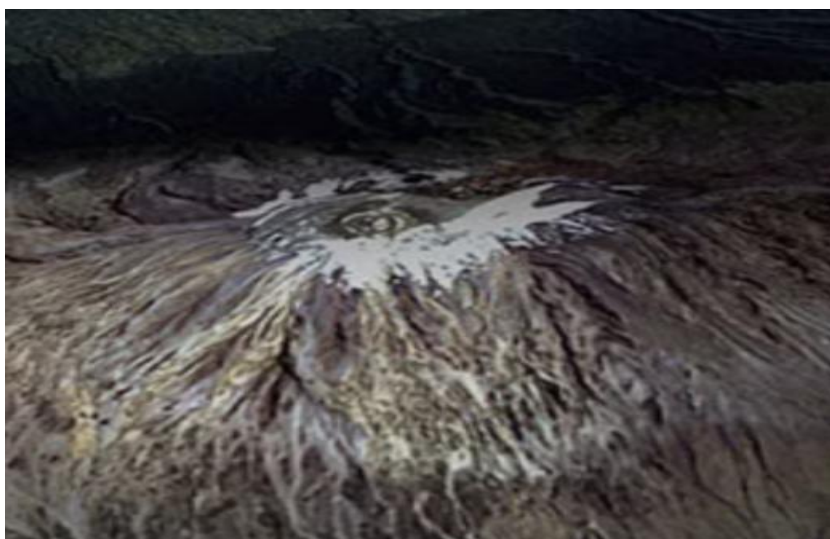
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INTRODUCTION

Global warming is the unusual increase of temperature of earth's surface. Global warming is when the sun's energy enters the atmosphere and heats the earth by light wave. The energy warms the earth and then re-radiates infrared waves back into space. Some of the infrared radiation going into space is naturally trapped by atmosphere, which keeps the temperature on earth moderate. The thin layer of earth's atmosphere is now being thicker by large amount of human – caused greenhouse gases like CARBON DIOXIDE. Earth's temperature is created with natural greenhouse effect from the sun. About 30% of sunlight is reflected back into space because of cloud and ice. The other 70% of sunlight is absorbed by the land and ocean. Our planet is heated by the solar energy. Without a greenhouse effect; the earth's average temperature would be -18 Celsius {0 degree F} instead of 15 degree Celsius

Today's atmosphere contain more greenhouse gas molecule, so more of the infrared energy is absorbed. Earth's climate has changed throughout history. Just in the last 650,000 years there have been seven cycles of glacial advance and retreat, with the abrupt end of the last ice age about 11,700 years ago marking the beginning of the modern climate era and of human civilization.

Ice cores drawn from green land, Antarctica and Tropical Mountain glaciers show that earth's climate responds to changes in greenhouse gas levels. Ancient evidence can also be found in tree ring, oceans sediments, corals reefs and layers of sedimentary rocks. CARBON DIOXIDE from human activities is increasing more than 250 times faster than it did from natural sources after the last ice age.



The current warming trend is of particular significance because most of it is likely { probability greater than 95% } to be the result of human activity since the mid-20th century and proceeding at a rate that is unprecedented over millennia .The current warming trend is of particular significance because most of it is likely { probability greater than 95% } to be the result of human activity since the mid-20th century and proceeding at a rate that is unprecedented over millennia .

The planets average surface temperature has risen about 2.12 degree Fahrenheit {1.18 degree Celsius} since the late 13th century , a change driven largely by increased CARBON DIOXIDE emission into the atmosphere and other human activities . Most of the warming occurred in past 40 years, with the seven most recent year being the warmest. The year 2016 and 2020 are tied for the warmest year on record.

Due to increase in global warming the green land and Antarctic ice sheet have decreased in mass. Data from NASA's gravity recovery and climate experiment show green land lost an average of 279 billion tons of ice per year between 1953 and 2019, while Antarctic lost about 148 billion tons of ice per year.

Glaciers are retreating almost everywhere around the worlds – including ALPS, HIMALAYAS, ARDES, ROCKIES, ALASKA and AFRICA.



The CARBON FOOTPRINT is very important means to understand the impact of a person's behavior on global warming. This is why someone who effectively wants to contribute in stopping

global warming, at least on an individual scale, we need to measure and keep track of their personal CARBON FOOTPRINT.

A carbon footprint corresponds to the whole amount of greenhouse gases (GFG) produced to, directly and indirectly support person's lifestyle and activities.

CARBON FOOTPRINT are usually measured in equivalent tons of CO₂ during the period of year, and they can be associated with an individual, an organization, a product or an event, among others.

The result in a CARBON FOOTPRINT can come from the production and consumption of fossil fuels, foods, manufactured goods, materials, roads or transportation. And despite its importance, CARBON FOOTPRINT are difficult to calculate exactly due to poor knowledge and short data regarding the complex interaction between contributing processes like the influence of natural processes that store or release CARBON DIOXIDE.

DATA COLLECTION

This data was collected through a survey conducted by our group members.

It gives us a brief information about LPG, fuel and electricity consumption in our locality on an individual level.

1. Electricity: Collect data on your annual electricity bills. You can find the number of power units (In India, one unit = 1KWh of electricity) consumed in your home from the monthly electricity bills issued by State Electricity Board/ Distribution/Collection companies. Take monthly consumed units and then multiply them by 12 (No of months in a year).
2. Petrol/Diesel: Add the number of liters of petrol/diesel you used in your car/motorcycle in a year. If you do not remember the exact value right now, please add average values.
3. LPG: Generally one LPG cylinder has around 14 kg of liquefied petroleum gas. Multiply the number of cylinders used in a year by 14 and add the resulted value in the calculation.



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CANDIDATE NO.	LOCATION	NO. OF CYLINDERS	ELECTRICITY UNIT	PETROL/DIESEL
1	Mumbai	14	2000	60
2	Mumbai	6	1400	80
3	Mumbai	12	2100	125
4	Mumbai	12	2400	160
5	Mumbai	14	1500	140
6	Mumbai	10	1800	110
7	Mumbai	15	3300	200
8	Mumbai	12	2800	180
9	Pune	14	1400	100
10	Pune	10	1200	220
11	Pune	12	1300	160
12	Pune	14	1400	180
13	Pune	14	1600	120
14	Pune	12	1600	120
15	Pune	18	3000	140
16	Pune	12	2800	80
17	Aurangabad	10	1300	180
18	Aurangabad	14	2400	160
19	Aurangabad	10	2400	100
20	Aurangabad	13	2000	160
21	Aurangabad	10	1000	180
22	Ahmednagar	14	2000	180
23	Ahmednagar	10	2400	120
24	Ahmednagar	14	1800	150
25	Raigad	24	1200	100
26	Nashik	12	1200	100
27	Nanded	12	1600	90

CARBON FOOTPRINT are usually measured in equivalent tons of co2 during the period of year.

- A. Electricity: Input value (in KWh/Yr.) X 0.85 (Emission Factor) = Output value in (Kg of CO₂)
- B. Petrol: Input Value (In Liters/Yr.) X 2.296(Emission Factor) = Output value in (Kg of CO₂).
 Diesel: Input Value (In Liters/Yr.) X 2.653 (Emission Factor) = Output value in (Kg of CO₂)
- C. LPG: Input Value (In Kg/Yr.) X 2.983 (Emission Factor) = Output value in (Kg of CO₂)

Your Carbon Footprint: Add (A+B+C) = Output value in (Kg of CO₂)

Divide final value with 1000 so that you get a total carbon footprint in a ton of CO₂.

The final Carbon footprint should be in tons of CO₂ (tCO₂).

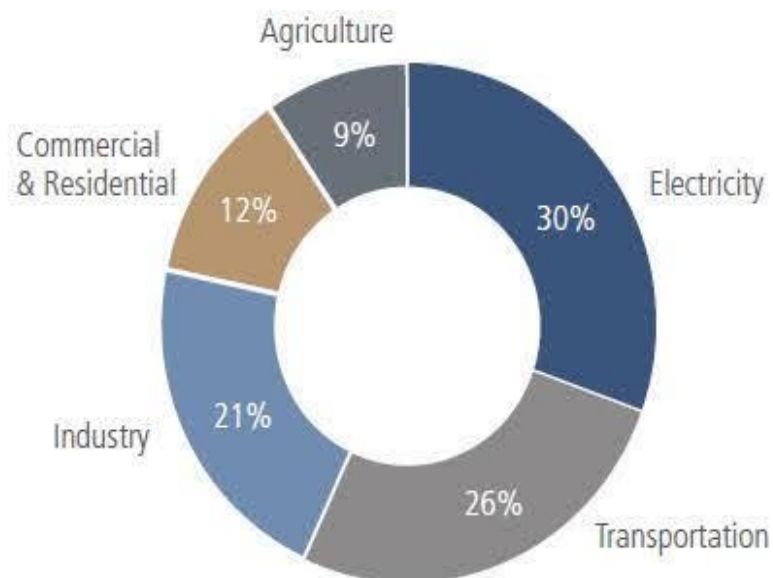
CANDIDATE NO.	LOCATION	(A) CARBON EMISSION FOR LPG IN KG PER YEAR	(B) CARBON EMISSION FOR ELECRICITY IN KWH PER YEAR	(C) CARBON EMISSION FOR PETROL/DIESEL IN KG PER YEAR	CARBON FOOTPRINT IN TONS FOR A YEAR
1	Mumbai	584.08	1700	144	2.42808
2	Mumbai	250.32	1190	192	1.63232
3	Mumbai	500.64	1785	300	2.58564
4	Mumbai	500.64	2040	384	2.92464
5	Mumbai	584.08	1275	336	2.19508
6	Mumbai	417.2	1530	264	2.2112
7	Mumbai	625.8	2805	480	3.9108
8	Mumbai	500.64	2380	432	3.31264
9	Pune	584.08	1190	240	2.01408
10	Pune	417.2	1020	528	1.9652
11	Pune	500.64	1105	384	1.98964
12	Pune	584.08	1190	432	2.20608
13	Pune	584.08	1360	288	2.23208
14	Pune	500.64	1360	288	2.14864
15	Pune	750.96	2550	336	3.63696
16	Pune	500.64	2380	192	3.07264
17	Aurangabad	417.2	1105	432	1.9542
18	Aurangabad	584.08	2040	384	3.00808
19	Aurangabad	417.2	2040	240	2.6972
20	Aurangabad	542.36	1700	384	2.62636
21	Aurangabad	417.2	850	432	1.6992
22	Ahmednagar	584.08	1700	432	2.71608
23	Ahmednagar	417.2	2040	288	2.7452
24	Ahmednagar	584.08	1530	360	2.47408
25	Raigad	1001.28	1020	240	2.26128
26	Nashik	500.64	1020	240	1.76064
27	Nanded	500.64	1360	216	2.07664

Despite its importance, CARBON FOOTPRINT are difficult to calculate exactly due to poor knowledge and short data regarding Complex processes and industrialization.

DATA ANALYSIS

FROM WHICH SECTOR CO₂ COMES FROM?

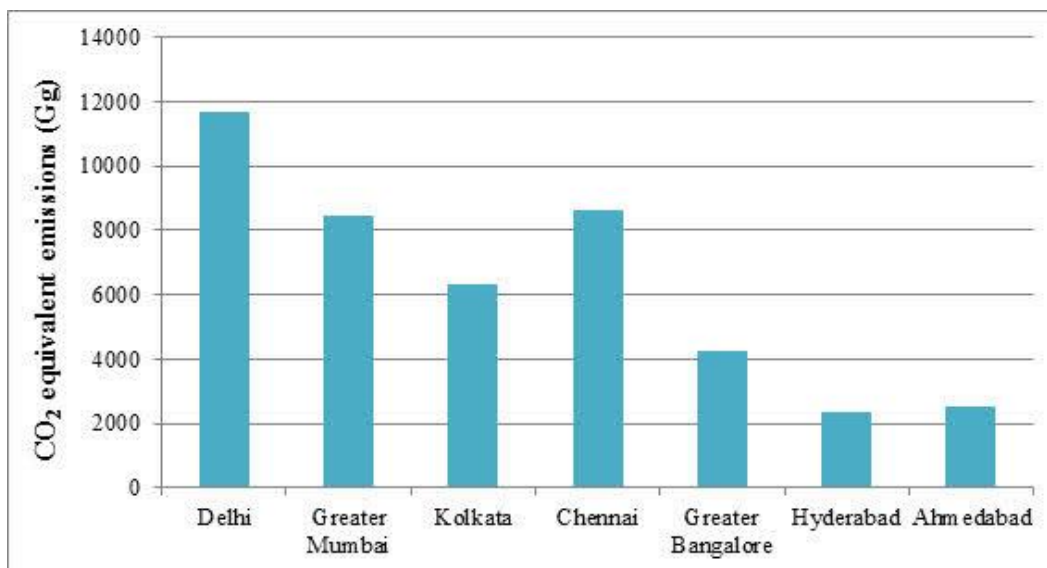
- Carbon dioxide emissions continue to rise, at a time when they need to be rapidly falling. To effectively reduce emissions we need to know where they are coming from – which sectors contribute the most? How can we use this understanding to develop effective solutions and mitigation strategies? Below we look at the breakdown of emissions of carbon dioxide – by sector.



- To prevent severe climate change we need to rapidly reduce global greenhouse gas emissions. The world emits around 50 billion tonnes of greenhouse gases each year *[measured in carbon dioxide equivalents (CO₂ eq)]*

- To figure out how we can most effectively reduce emissions and what emissions *can* and *can't* be eliminated with current technologies, we need to first understand where our emissions come from.
- Electricity is the largest carbon emission sector i.e of 30%, after that Transportation is the second highest sector for emission, followed by industries, commercial resident and agriculture
- It is clear from this breakdown that a range of sectors and processes contribute to global emissions. This means there is no single or simple solution to tackle climate change. Focusing on electricity, or transport, or food, or deforestation alone is insufficient.
- To reach net-zero emissions we need innovations across sectors. Single solutions will not get us there.

ANALYSIS OF INDIA :

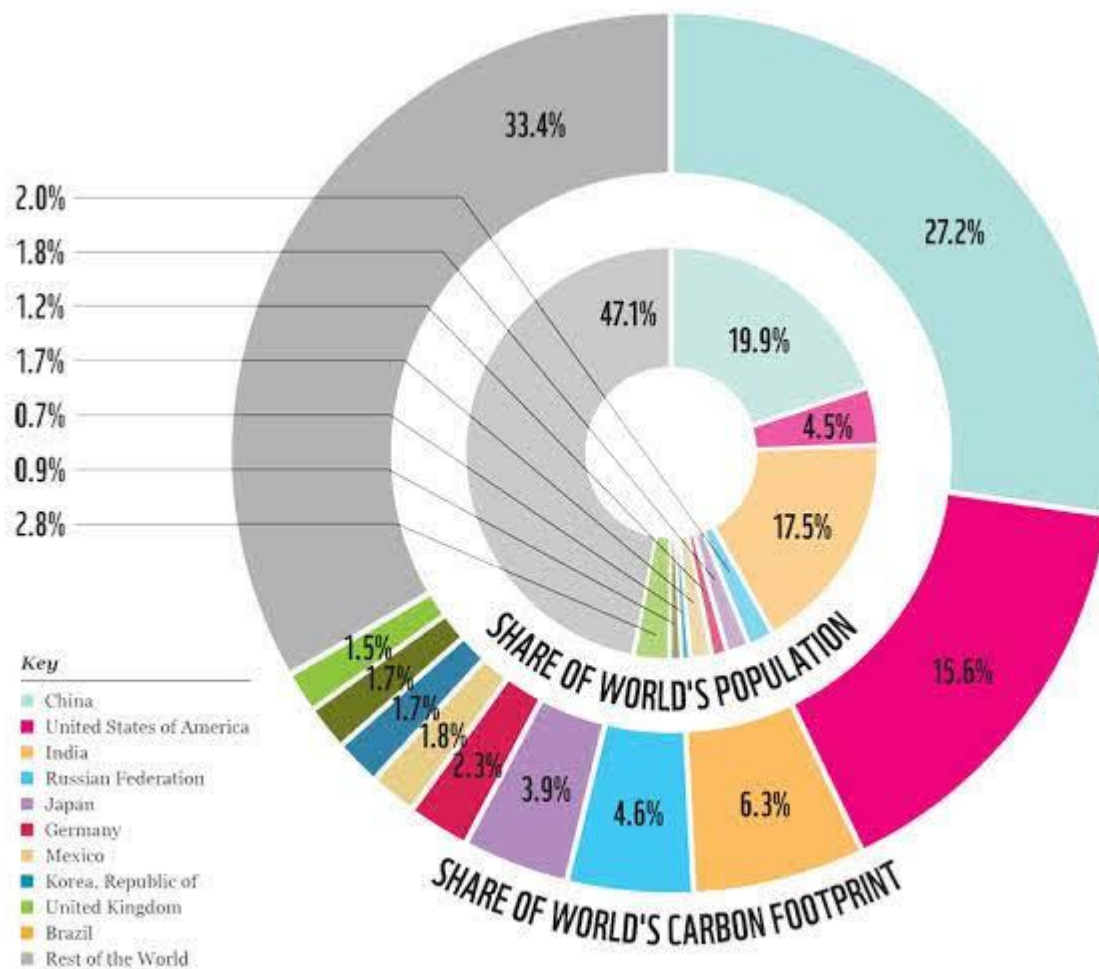


- Not surprisingly, the national capital region of Delhi has the highest annual carbon footprint in the country. In fact, Delhi's annual CO₂ emission of 69.4 million tonnes is equal to the CO₂ emission of Bangalore, Hyderabad and Chennai put together. When it comes to per capita CO emission, Chandigarh and Vadodara are far ahead of the rest with 3.9 tonnes and 3.5 tonnes respectively..
- The carbon footprint for a Mumbaiite was concentrated in the range of 0.51 to tonnes of carbon dioxide per year.

The analysis found that higher income groups have a higher carbon consumption lifestyle as compared to those from lower income groups. "The wealthy need to understand climate change because they are the ones who own two to three cars and use air-conditioners; all of which are high carbon dioxide emitters. Cutting down on electricity bills and car fuel will also mean monetary gain for the individual."

ANALYSIS OF WORLD :

- The research says China emitted 27% of the world's greenhouse gases. The US is the second-largest emitter at 15.6% while India is at third with 6.3% of emissions.
- Since, population of U.S is very much less than India but by research it is observed that U.S emit carbon more than India, it is because of their high living Standards.



- In India, CO₂ emissions are dominated by the burning of fossil fuels for energy production, and industrial production of materials such as cement. Since, India has the second highest population in the world i.e 17.5% of the world's total population, so this increases the consumption of food, energy, goods and Services, and hence results in the increase of CO₂ emission..

CONCLUSION :

The goal of this project has been to help people understand, calculate and shrink their carbon footprints. Whether your aim is to reduce your footprints by one tonne, or to shrink it to one tonne, this guide should be full of useful information.

If you make a serious effort to shrink your own carbon footprints you will be confronted with a number of challenges. meeting your housing, travel, food, product and services. Footprints on a strict carbon budget is not easy, but this challenge is exactly what we must do both individually or collectively in order to limit the risk of climate change.

Your personal carbon footprint is what you leave behind as a result of moving about, consuming, eating and using resources like energy. Environmental NGO The Nature Conservancy estimated that each inhabitant on the planet produces an average of almost four tons of CO₂ every year, while in countries like the United States this amount is up to four times that per person and per year.

The Nature Conservancy says that we all need to reduce our carbon footprints to less than two tons per year by 2050. The experts say that this is the best way to ensure that temperatures stop rising and don't reach the dreaded 2 °C threshold, which would exacerbate climate change and transform it into an irreversible problem.

The next few years will be decisive in our fight against climate change and our success will certainly depend on our ability to reduce our carbon footprint. Here are

some tips to help you can do that:

- **Learn the 5 R's: refuse, reduce, reuse, rot, recycle:**

Going zero waste is a great step towards combating climate change.

Practicing the 5 R's of zero waste can help. You've probably heard of the three R's:

Reduce, Reuse and Recycle. But there are two more that are equally important. Lets

break it down:



REFUSE: Avoid single use plastics and paper products by saying no thank you, opting for reusables.

REDUCE: Downsize what you purchase, opting to be more mindful of what you really need.

REUSE: Always find a way to keep an item out of the landfill by keeping it in great condition, repairing or upcycling it when it breaks.

ROT: Set up a compost system for your food scraps, or find a food scrap drop off center (like a farmers market, or community garden) near your house.

RECYCLE: Properly recycle any plastic, paper, glass or metal that comes into your life you cannot refuse, reduce, or reuse by researching your state's recycling laws.



Choose responsible consumption, based on local products and sustainable production, and start growing produce in your own urban garden.



Get about using sustainable means of transport, such as public transport, bicycle or on foot, and buy vehicles that are environmentally friendly.



Choose a 100 % renewable energy consumption, buy energy-saving appliances, and control heating and air conditioning to save energy.



Be aware and tell others about the importance of reducing the carbon footprint.



Reduce waste, Reuse your packaging, Recycle it and if this is not possible, dispose of it in the appropriate container.

REFERENCES:

<https://youmatter.world/en/definition/definitions-carbon-footprint/>

<https://greencleanguide.com/calculate-your-carbon-footprint/>

<https://ourworldindata.org/emissions-by-sector>

https://www.downtoearth.org.in/dte-infographics/61005_emission_cities_india.html

<https://www.hindustantimes.com/mumbai/city-s-annual-carbon-emission-twice-that-of-national-average/story-cL0QVLcgFx9RMcfI0sSUP.html>