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What is Global Warming?



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Global warming

- Global warming is the increase of the Earth's average surface temperature due to a build-up of greenhouse gases in the atmosphere



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Climate Change

- is a broader term that refers to long-term changes in climate, including average temperature and precipitation.



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Difference

GLOBAL WARMING

is the increase of the Earth's average surface temperature due to a build-up of greenhouse gases in the atmosphere.



CLIMATE CHANGE

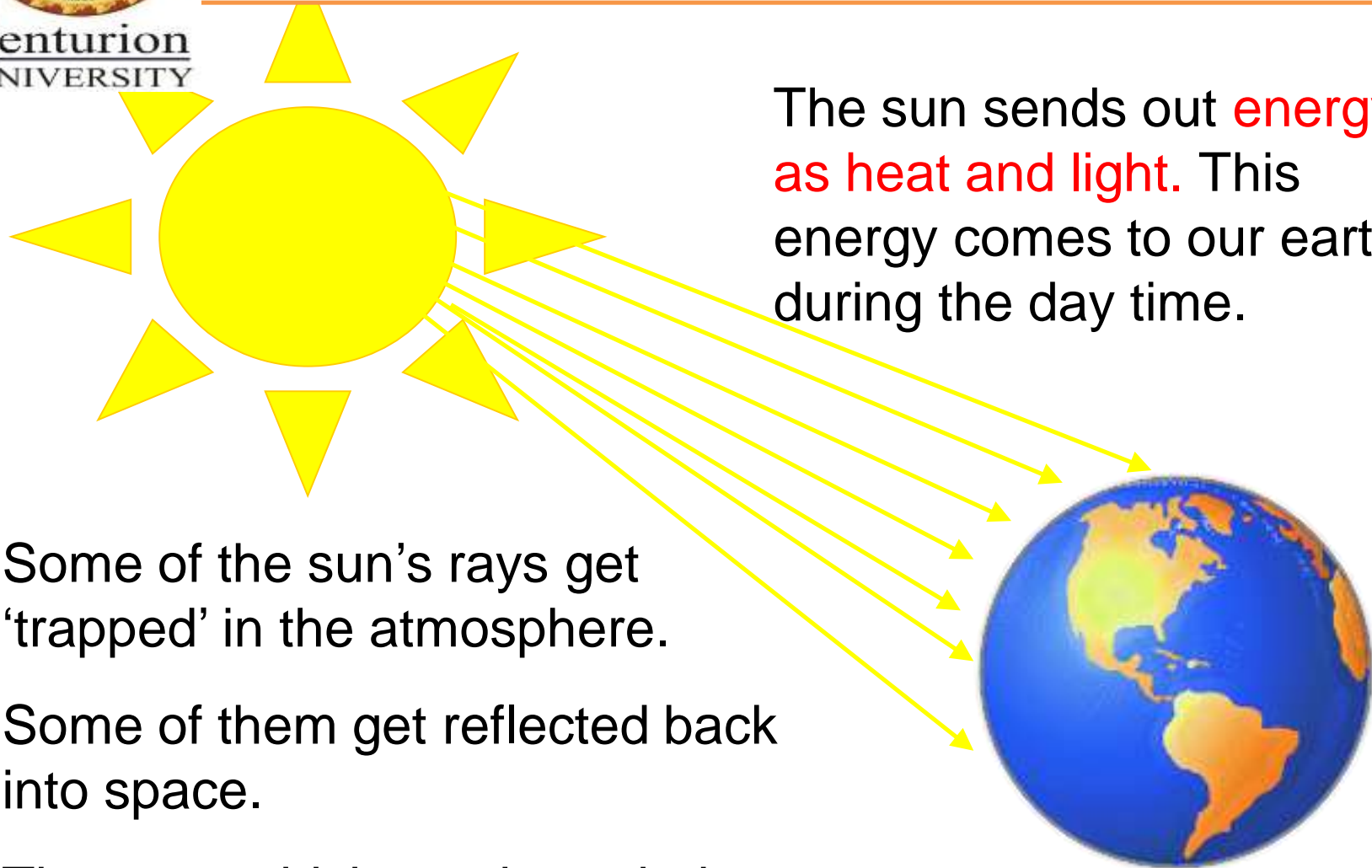
is a broader term that refers to long-term changes in climate, including average temperature and precipitation.





Global warming

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The sun sends out **energy as heat and light**. This energy comes to our earth during the day time.

Some of the sun's rays get 'trapped' in the atmosphere.

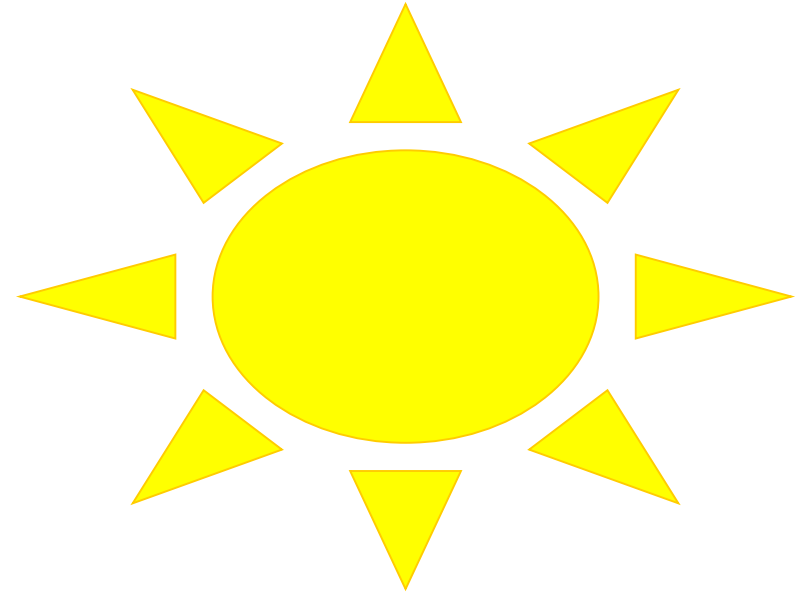
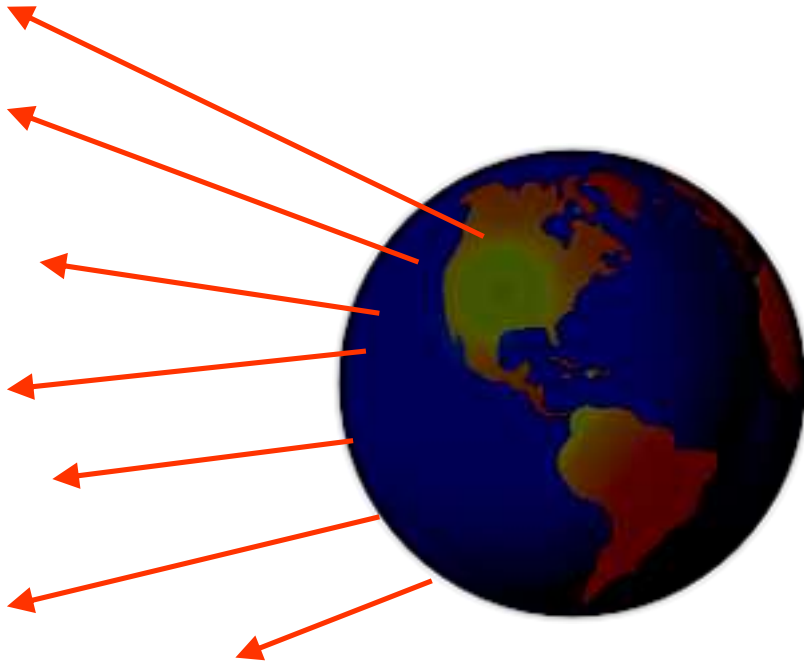
Some of them get reflected back into space.

The ones which get through the atmosphere warm the earth up.



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All the time, the earth radiates heat into space, which cools it down. We only really notice this at night, when there is no heating from the sun.



Some of the heat going out is trapped by the atmosphere. This is what makes our planet warm enough to live on.

But if too much heat is trapped, our planet will warm up and the climate will change.



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What is the atmosphere and why does it trap heat?

The atmosphere is the air around the surface of the earth. It is made from a mixture of gases. We need it for animals and plants to survive.

Some of the gases act like a blanket, trapping heat. These gases are called '**greenhouse gases**'.

This is known as the '**Natural Greenhouse Effect**'. Without it, the earth would be much colder.



(the atmosphere is really much thinner than it looks above)



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So why is global warming happening?

Some things that people do are increasing the amounts of the greenhouse gases in the atmosphere, so more heat is trapped.

The heating of the earth through human activities is called the **'Enhanced Greenhouse Effect'** and this is causing the earth to heat up, or **global warming**.

Global warming doesn't just mean that the earth gets hotter, it means that the whole **climate is changing**.



(the atmosphere is really much thinner than it looks above)



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Natural Greenhouse
effect

Natural Greenhouse effect

Heat radiates from the earth

Heat radiates from the earth

Some heat goes out to space

Less heat goes out to space

Atmosphere traps some heat

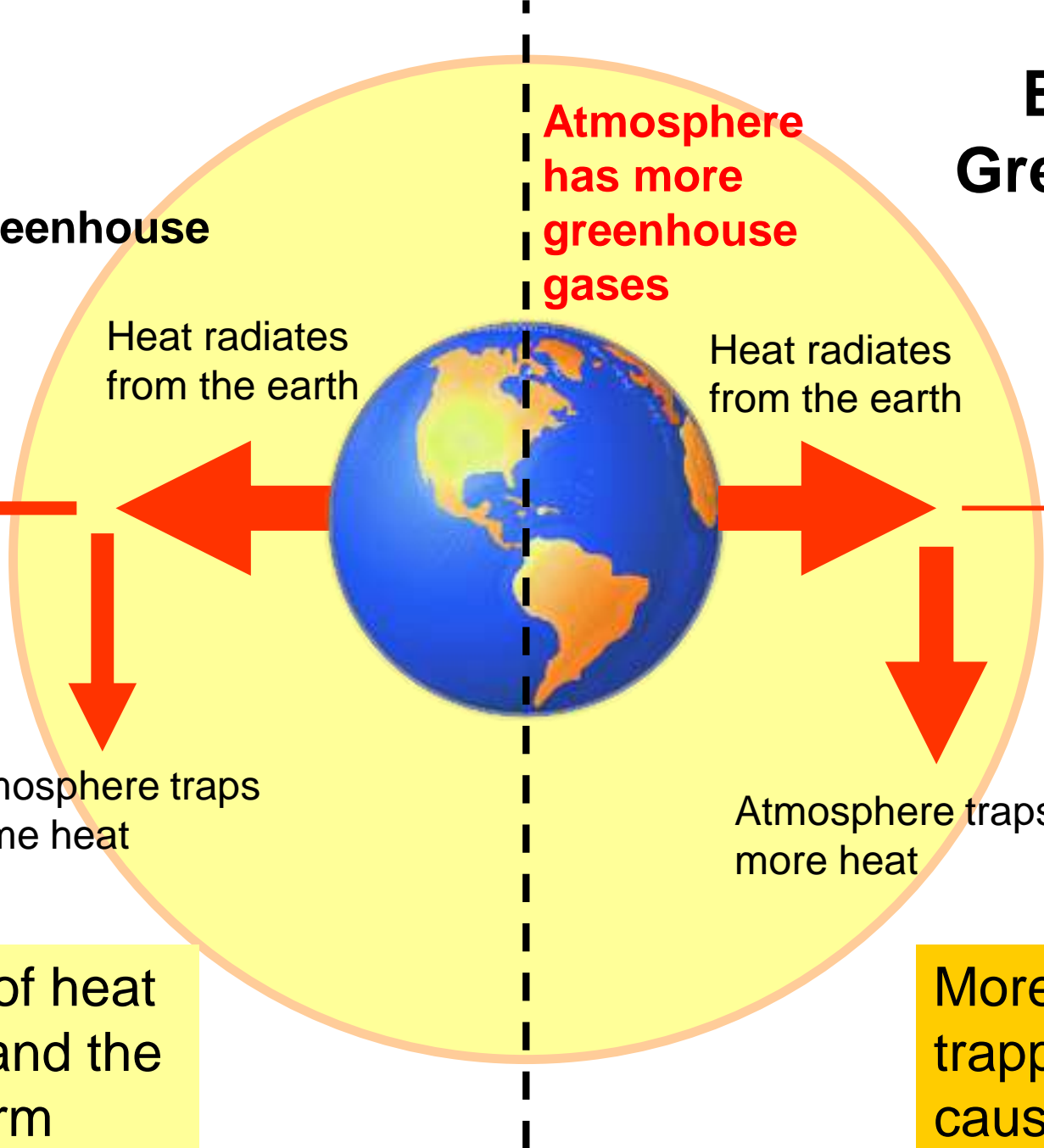
Atmosphere traps more heat

Quite a lot of heat is trapped and the earth is warm enough for life.

More heat is trapped and causes global warming

Atmosphere has more greenhouse gases

Enhanced Greenhouse effect



Which gases in the atmosphere trap heat?

The atmosphere is made of **78% Nitrogen and 21% Oxygen**.
But these gases **don't** trap heat and cause global warming or climate change.

What % of the atmosphere is left?

The gases which trap heat make up less than 1% of the atmosphere! They are called the 'greenhouse gases'.

The main greenhouse gases are:

Carbon dioxide

Methane

Nitrous oxide

Ozone

Water vapour

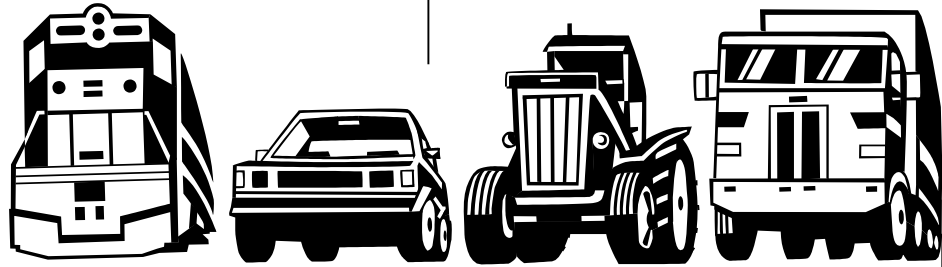
Halocarbons



Human activity increases the amount of these gases in the atmosphere

How do humans increase carbon dioxide levels in the atmosphere?

Burning **fossil fuels** releases the carbon dioxide stored millions of years ago. Most of the increased carbon dioxide comes from fossil fuels



Deforestation releases the carbon stored in trees. Less trees also means less **carbon dioxide** can be removed from the atmosphere.



How do humans increase methane levels in the atmosphere?

Methane is produced when bacteria rot **organic matter**



Increased livestock farming



Increased rice growing



Increased rubbish in landfill

Methane is also released when **fossil fuels are extracted**



The amount of **methane** in the atmosphere has increased by two and a half times since the Industrial Revolution.

Effects of Global Warming

Rising Sea Level



Increased Temperature



Habitat Damage and Species Affected



Changes in Water Supply



Glacier



1914



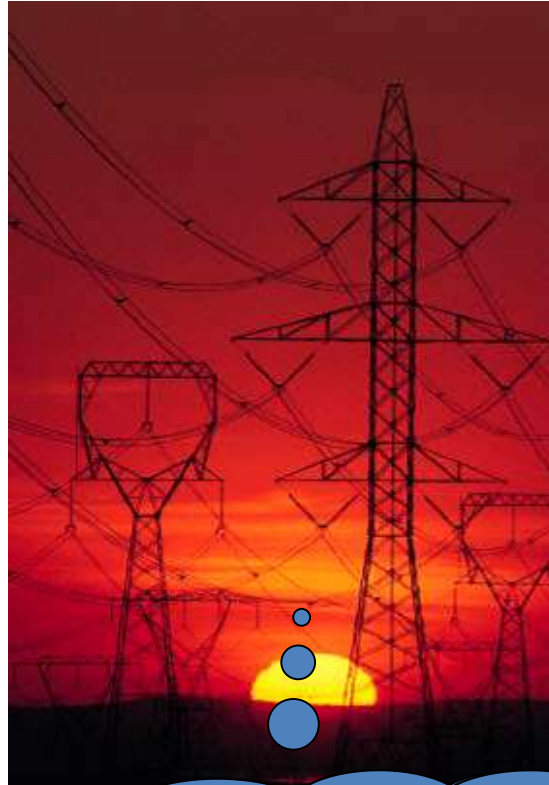
2004



Why is global warming happening?



Burning of Fossil Fuels



**Pollution from coal,
natural gas, and oil**

How to say no to Global Warming

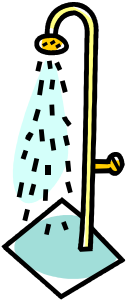
Simple Things To Do

Turn off your computer or the TV

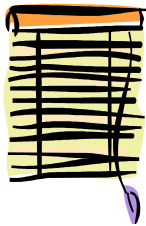


when you're not using it.

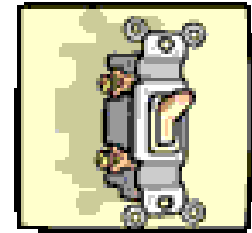
Take shorter showers. Heating water uses energy.



Keep rooms cool by closing the blinds, shades, or curtains.



Turn off the lights when you leave a room.



Use compact fluorescent bulbs.

What's being done now to reduce our emissions?



Wind Power



Solar Power



Fuel-Efficiency

How to say no to Global Warming

1. Insulate our home, clean our air conditioning filters and install energy efficient showerheads.
2. Replace our current home appliances (refrigerator, washing machine, dish washer) with high- efficiency models.
3. Recycle our home's waste newsprint, cardboard, glass and metal.
4. Install a solar heated system for hot water.
5. Buy food and other products with reusable or recyclable packaging instead of those in non- recyclable packaging.
6. Patronise local foods and goods. In this manner, transporting goods and foods prepared which use fuel from conventional energy sources will be minimised.
7. Stop smoking or at least follow the "No Smoking" sign

9. Keep car properly maintained to keep it in good running condition to avoid smoke emissions. Share a ride or engage in car-pooling. Instead of choose to walk or ride a bicycle whenever possible.
10. Live green by using green power supplied abundantly and freely by wind and the sun. Enjoy fresh air from open windows to lessen the use of air conditioning system.
11. Hang our laundry to dry to minimise use of gas or electricity from dryers.
12. Use eco-friendly or biodegradable materials instead of plastic which are made up of highly toxic substances injurious to our health.

13. Create our green space. Plant more trees and put indoor plants in our homes.
14. A proper waste disposal system especially for toxic wastes.
15. Never throw, run or drain or dispose into the water, air, or land any substance in solid, liquid or gaseous form that shall cause pollution.
16. Do not cause loud noises and unwanted sounds to avoid noise pollution.
17. Do not litter in public places. Anti-litter campaigns can educate the populace.

18. Industries should monitor their air emissions regularly and take measures to ensure compliance with the prescribed emission standards.
19. Industries should strictly follow applicable government regulations on pollution control.
20. Organic waste should be dumped in places far from residential areas.
21. Adopt the 3Rs of solid waste management: reduce, reuse and recycle. Inorganic materials such as metals, glass and plastic; also organic materials like paper, can be reclaimed and recycled.
22. Celebrate birthday and rituals by planting tree not lighting the candle.

We humans are thought to be the main
cause of global warming and climate
change.....

And we still have the chance to do
something about it.

Fossil fuel combustion/use

- The largest human source of carbon dioxide emissions is from the combustion of fossil fuels.
- This produces 87% of human carbon dioxide emissions.
- Burning these fuels releases energy which is most commonly turned into heat, electricity or power for transportation. Some examples of where they are used are in power plants, cars, planes and industrial facilities.
- In 2011, fossil fuel use created 33.2 billion tonnes of carbon dioxide emissions worldwide.

- The 3 types of fossil fuels that are used the most are **coal, Natural gas and Oil.**
- *Coal is responsible for 43% of carbon dioxide emissions from fuel combustion.*
- *36% is produced by oil*
- **And 20% from natural gas.**
- Coal is the most carbon intensive fossil fuel. For every tonne of coal burned, approximately 2.5 tonnes of CO₂e are most carbon dioxide.

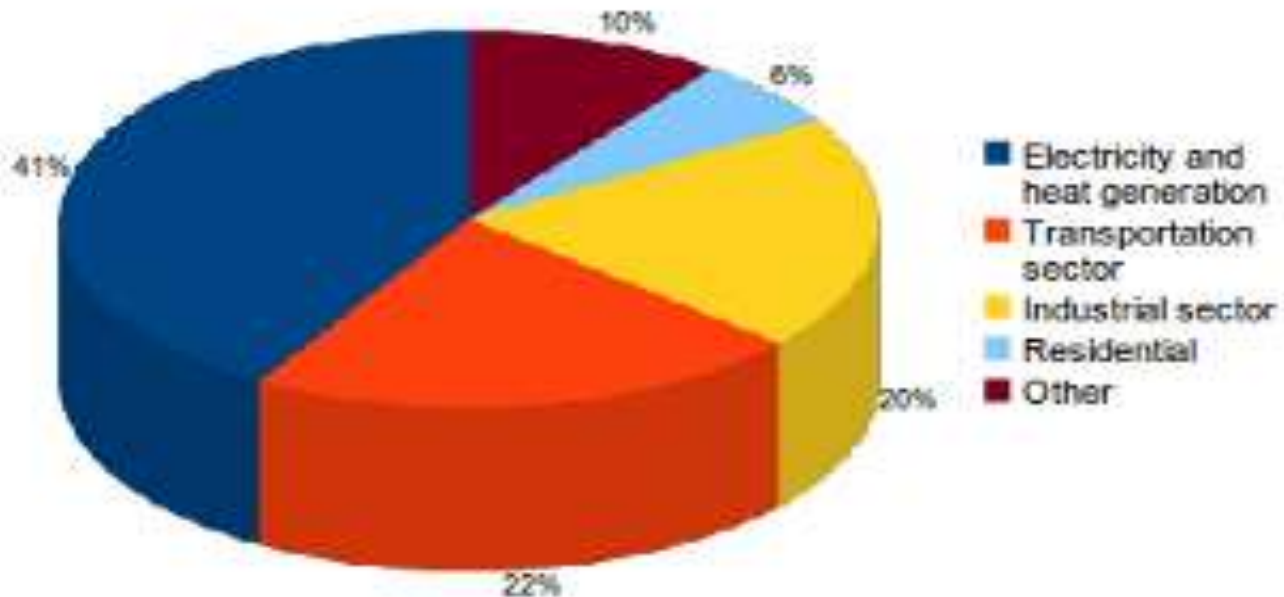
3 Main sectors use fossil fuels

- The three main economic sectors that use fossil fuels are:
 - Electricity/heat,
 - Transportation
 - Industry

Electricity/Heat sector

- Electricity and heat generation is the economic sector that produces the largest amount of man-made carbon dioxide emissions. This sector produced 41% of fossil fuel related carbon dioxide emissions.

Carbon dioxide emissions from fossil fuel combustion



Transportation sector

- The transportation sector is the second largest source of anthropogenic carbon dioxide emissions.
- Transporting goods and people around the world produced 22% of fossil fuel related carbon dioxide emissions

Industrial sector

- The industrial sector is the third largest source of man-made carbon dioxide emissions. This sector produced 20% of fossil fuel related carbon dioxide emissions.
- Manufacturing is the largest of the 4 and can be broken down into 5 main categories: paper, food, petroleum refineries, chemicals, and metal/mineral products for producing carbon dioxide emissions.

Land use changes

- Land use changes are when the natural environment is converted into areas for human use like agricultural land or settlements
- Land use changes are a substantial source of carbon dioxide emissions globally, accounting for 9% of human carbon dioxide emissions and contributed 3.3 billion tonnes of carbon dioxide emissions.
- Deforestation has been responsible for the great majority of these emissions.
- Deforestation is the permanent ***removal of standing forests and is the most important type of land use*** change because its impact on greenhouse gas emissions

Industrial processes

- But there are four main types of industrial process that are a significant source of carbon dioxide emissions:
- The production and consumption of mineral products such as **cement**,
- The production of metals such as **iron and steel**,
- As well as the production of **chemicals and petrochemical products**

Carbone Dioxyde Emissions: Natural Sources

- Apart from being created by human activities, carbon dioxide is also released into the atmosphere by natural processes.
- **The Earth's oceans, soil, plants, animals and volcanoes** are all natural sources of carbon dioxide emissions.

Natural sources of carbon dioxide

