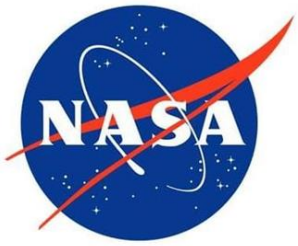

NASA SPACE APPS

Benefit from harm

Adjusted by proportion

Team name: Space-time stars

Members name:

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- Sara Nabil
- Asmaa khatab
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- Seif El- Desouky

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Identifying the problem

Climate change is long-term shifts in temperature and weather patterns. These shifts may be natural and occur through changes in the solar cycle, but since the nineteenth century human activities have become the main cause of climate change due to the burning of fossil fuels such as (coal, oil and gas), which Resulting in greenhouse gas emissions (water vapor, carbon dioxide, nitrous oxide, methane, hydrocarbons and CFCs)

Which works like a cover wrapped around the earth, which leads to according to the heat of the sun and raise the temperatures.

These gases are also produced by using gasoline to drive cars or coal to heat buildings. Clearing land of weeds, shrubs and deforestation releases carbon dioxide. Landfills are a major source of methane emissions. The production and consumption of energy, industry, transportation, buildings, agriculture, and land use are among the major emitters.

Energy from the sun is what makes the Earth warm. This energy is made of different types of radiation. Actually, all three happen! About 30% of the radiation is reflected by clouds and the Earth's surface, roughly 20% is absorbed by gases like oxygen (O_2), ozone (O_3) and water vapor in the atmosphere, and the remaining 50% is absorbed by the Earth's surface.

The solar radiation absorbed by the atmosphere and the Earth's surface is what gives our planet its warmth.

When we say the Earth “absorbs radiation”, we mean that it absorbs energy from the sun, and releases it again as infrared radiation. Infrared radiation has a longer wavelength than visible light, so a lot of it is absorbed by the atmosphere (unlike the shortwave radiation from the sun). Specifically, the infrared radiation is absorbed by gases called greenhouse gases that re-radiate the infrared waves out in all directions - some into space and some back to Earth. The infrared radiation that is radiated back to Earth causes further warming at the surface and lower atmosphere. This extra warming is called the greenhouse effect. There are several different greenhouse gases. These include:

Water vapor (H_2O)

Carbon dioxide (CO_2)

Methane (CH_4)

Nitrous oxide (N_2O)

Without the greenhouse effect, the average temperature on the Earth would be -18°C! But too much of it is not good either:

Human activities are speeding up this process of global

Warming through increased production of greenhouse

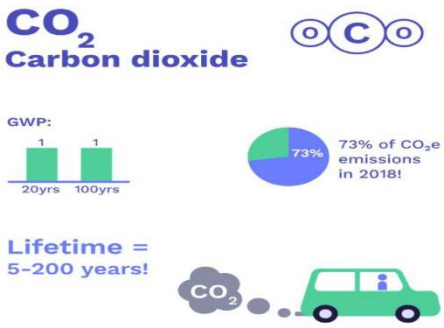
Gases; especially carbon dioxide (CO_2).

We've also released plenty of methane and N_2O.

This means that more of the infrared radiation coming

Off of the Earth is re-radiated back towards the Earth's

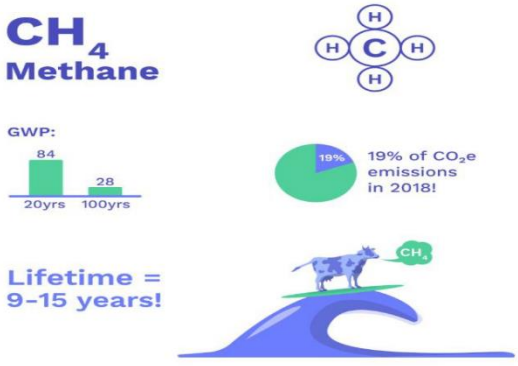
Surface, warming it up. Different greenhouse gases differ



In their ability to absorb radiation, and how long they stay in the atmosphere (their "lifetime"). Carbon Dioxide (CO_2). CO_2 is the single most important greenhouse gas directly released by human activity. It is produced in high quantities by human sources, and stays in the atmosphere for a long time.

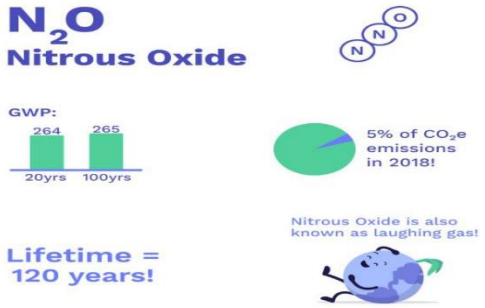
<u>Methane (CH_4)</u>

Methane's lifetime in the atmosphere is much shorter than CO_2 but it is more efficient at trapping radiation.



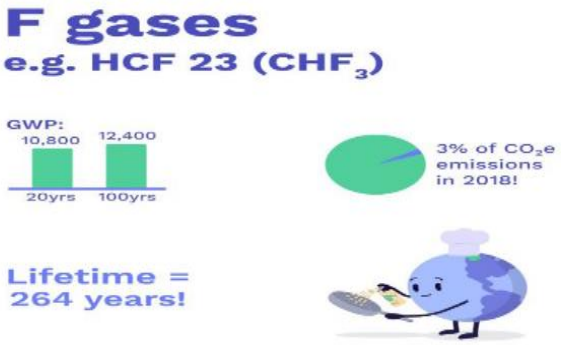
Nitrous Oxide (N_2O)

Nitrous oxide has a much greater GWP than CO_2, but less is emitted, and from fewer sources, so it has less of an impact on the global climate at present. Nitrous Oxide (N_2O). Nitrous oxide has a much greater GWP than CO_2, but less is emitted, and from fewer sources, so it has less of an impact on the global climate at present.



Fluorinated Gases

Fluorinated gases can stay in the atmosphere for thousands of years and have a high GWP, but emissions are lower than those of other greenhouse gases. An example of a fluorinated gas is HCF-23 (CHF_3).

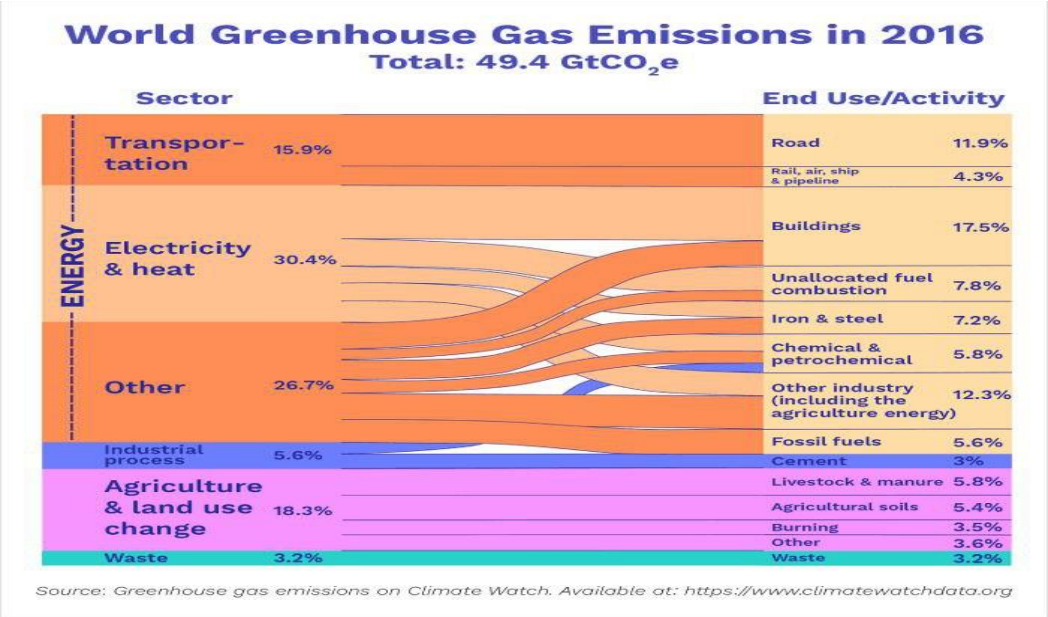


Humans releasing greenhouse gases into the atmosphere are causing rapid climate change.

There are two popular ways to categorize greenhouse gas emissions from human activities:

1 By source - where the overall emissions are produced

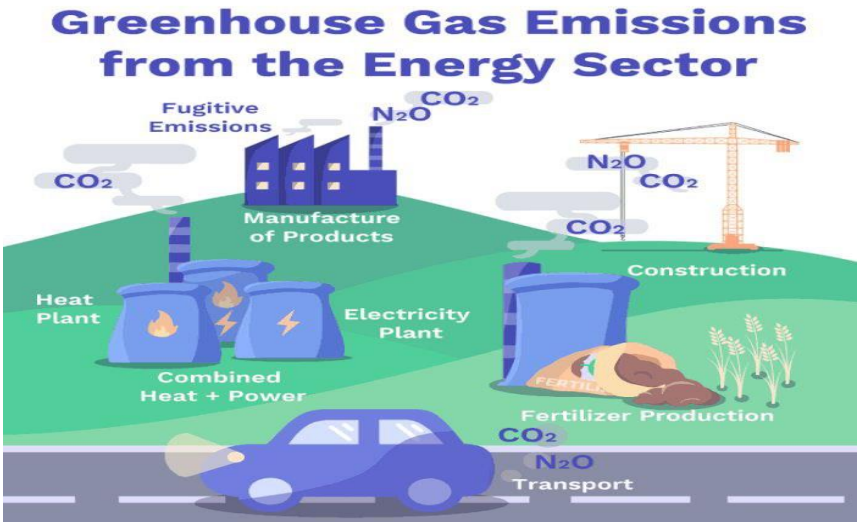
2 By end use - within each source what the emissions are used.



The left side of this chart splits emissions into which sector they come from, e.g. energy, agriculture and waste.

The right column of the chart shows emissions by end-use activities. This helps us understand the emissions released in the making of specific products and activities.

The production and distribution of energy produces 76% of greenhouse gas emissions! This includes emissions from producing heat and electricity, transport fuels, buildings, gas leaks and energy for producing fertilizer and consumer goods.

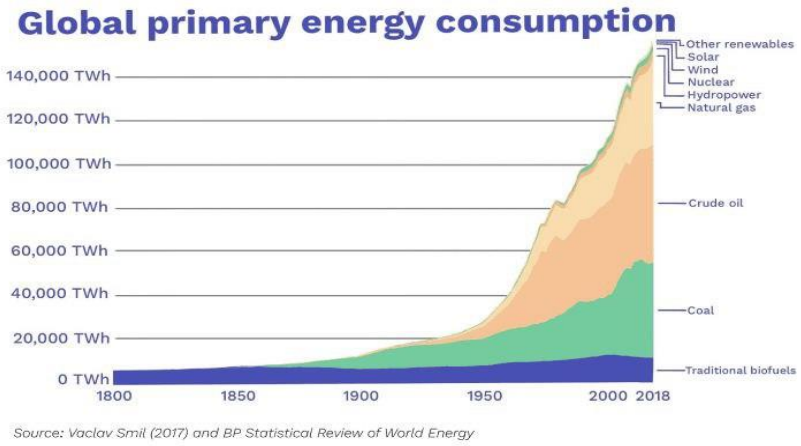


Sources of greenhouse gas emissions from the energy sector

Another 3.2% of human greenhouse gas emissions comes from the waste sector. Waste in landfills, sorting wastewater and treating human sewage all produce greenhouse gases, especially methane and nitrous oxide. The largest source of these comes from landfilling of solid waste, including food waste. Almost everything we do these days requires large amounts of energy.

What's this problem?

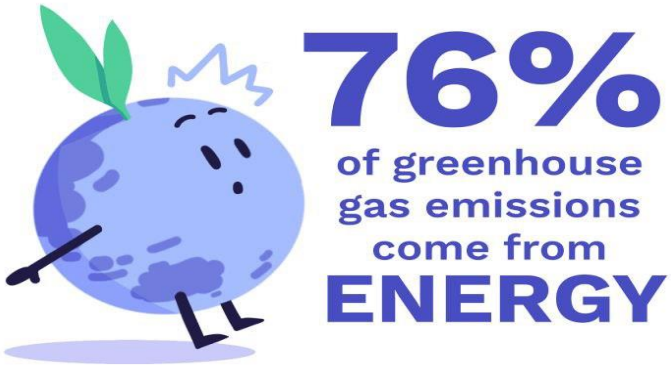
While energy seems to be important for development, much of the energy we use is produced in ways that are harmful to the environment.



This graph shows where we get our energy from. Sadly, 84% of our energy comes from fossil fuels (coal, oil, and gas). That's bad for climate change because burning fossil fuels creates the greenhouse gas CO_2.
Coal, oil, and gas emit much more CO_2 per unit of electricity generated than other sources of energy such as nuclear, wind, solar, and hydro energy.

As if this wasn't enough, fossil

As if this wasn't enough, fossil fuels are also responsible for more deaths than other energy sources due to air pollution.



The result of the problem:

Climate change will hurt humans, animals, and loads of other living things For humans, consequences of climate change include:

- Not enough food and water
- More people becoming climate refugees
- More health problems
- Negative impacts on people's jobs and livelihoods.

Let's start with food. Food is important.

How do you think crop growth will be affected by climate change?

In some places, and for some types of crops, climate change will increase growth. This is because warmer temperatures and higher CO_2 concentrations make for better growing conditions in places such as Europe. However, most places will see a reduced growth rate of crops, especially around the equator.

Climate change will affect water as well as food. Like with crops, the effects will be different in different places. Wet areas will get water and dry areas will get drier - meaning more flooding and more droughts. Other types of weather will be more extreme too: heatwaves and storms are both expected to get worse. All of these things will damage people's health - and on top of this, the changes in climate will affect how some diseases (like malaria and cholera) spread.

Some people may be forced to leave their homes and become climate refugees. This could be due to flooding, storms, droughts or conflicts driven by climate change, which make it impossible to keep living where they are.

These impacts will be very costly for nations and individuals - particularly those that are poorer. In fact, about 75-80% of the costs of climate change will be paid for by poorer countries. So even though inequality between rich and poor countries may have decreased in recent decades, global warming is slowing this progress.

What about other living things on Earth?

Climate change isn't just bad news for humans. Many other living things (like animals and plants) will have to migrate or adapt in order to survive. If they can't, they'll die out. When all of a certain type of animal or plant die out, this is called extinction.

Living things are already going extinct at a very high rate, mainly because of other human activities like hunting and land use change leading to habitat destruction. Climate change will only make this worse, and lots of extinctions cause huge problems for both nature and humans.

Waste Heat:

Waste heat occurs in almost all thermal and mechanical processes. Sources of waste heat include hot combustion gases discharged to the atmosphere, heated water released into the environment, heated products exiting industrial processes, and heat transfer from hot equipment surfaces. As such, waste heat sources differ regarding the aggregate state (mainly fluid and gaseous), temperature range, and frequency of their occurrence. The most significant

amounts of waste heat are being lost in industrial and energy generation processes. The exact amount of industrial waste heat is difficult to quantify, but various studies have estimated that as much as 20 to 50 percent of industrial energy consumption is ultimately discharged as waste heat and that between 18 and 30 percent of this waste heat could be utilized. Waste heat is defined as heat lost to the environment. This heat is the byproduct of any energy conversion process. Examples of energy conversion processes are, the conversion of chemical energy in gasoline to thermal energy and thermal energy to mechanical power in a combustion engine. Every time energy is converted to another form, heat is lost to the environment.

Why we chosen the waste heat and greenhouse gases essentially?

The chosen solution's sources are waste heat, greenhouse gasses, and by-products of the sugar factors.

Waste heat: because the unused flame that is located in the petroleum refinery is used, greenhouse gasses because the flame depends on gasses which make it ignite, by-products: because the flame which will be used depends on burned gasses that produce from refining the petroleum and the water vapor is by product to the sugar factors.

• The solution produces electric energy from waste heat.

• The solution decreases the effect of climate change on the environment.

• It helps to get a new source of cleaning water because seawater will be used to boil it to make steam and it will be condensed and form clean water in addition to forming navigable sedimentary salt.

The our solution

The specific problem which will be solved is finding resource to reduce greenhouse gasses, waste heat, and any something cause of climate change.

The idea is the idea is to use the waste heat resorted from the flame of the destination of the oil-related oil, by using the flame to heat water resulting from condensation of water vapor leaving sugar factories. So, the water will become boil and make steam. This steam is Makes turbines spin these turbines are connected to the generator to deliver the kinetic energy to the generator and convert it into electricity. The steam which is produced condensates and forms clean water in the container under the turbine. We have used weapons inferred in energy production. We chose this idea because there are more oil refineries, so there's more heat waste, and there’s more energy production.

Method

- Condensation turns the water vapor that leaves from the sugar factories into liquid water.
- Adding a conduit to allow heat from oil combustion to escape so that it is below the water container.
- Water begins to boil as heat rises from the tube, and as it does, the container is filled with the great pressure of steam.
- To supply steam for the turbine to rotate, a copper tube is mentioned in the water vessel's eye.
- A generator is joined to this turbine.
- The generator transforms the kinetic energy into electrical energy.
- Finally, certain LEDs can detect electricity and report it.

This is how our idea to solve this challenge.

What Will Happen If The Problem Be Solved?

Some of the something that solve are

Reducing the increase climate change:

Where the proportion of water vapor in the atmosphere is reduced, and it is also possible to use it after condensing it for the second time after moving the turbines.

The importance of using the waste heat resulting from petroleum refining:

Air and water pollution from petroleum, coal, and natural gas refineries is linked to breathing problems, neurological damage, heart attacks, cancer, premature death, and a host of other serious problems. And when the problem is resolved, coal and natural gas will no longer be used. Most of these negative health effects come from air and water pollution that clean energy technologies simply do not produce. Wind, electric, solar, and hydroelectric systems generate electricity without any associated emissions to air pollution. Geothermal and biomass systems emit some air pollutants.

Compared to fossil fuel technologies, which are usually mechanized and capital intensive, the renewable energy industry is more labor intensive. Solar panels need humans to install them; Wind farms need technicians for maintenance. This means that, on average, more jobs are created per unit of electricity generated from renewable sources than fossil fuels. Inexhaustible energy Strong winds, sunny skies, an abundance of plant matter, heat from the earth and fast-moving water can all provide a vast and constantly replenished supply of energy. A relatively small portion of electricity in the United States currently comes from these sources, but this may change: Studies have shown time and again that renewable energy can provide a significant share of future electricity needs, even after taking into account potential constraints o stable energy prices

Produce clean energy:

Renewable energy provides affordable electricity across the country right now and can help stabilize energy prices in the future. Although renewable facilities

require upfront investment to build, they can operate at very low cost so if built, this solution would solve two problems facing the whole world.

1- A significant decrease in the increase of climate change

2- To produce clean electrical energy at low cost

3-Reducing environmental pollution and the spread of diseases

Recommendation:

1- The procedure of returning the steam-condensed outgoing water to the water container once it has been condensed can be performed endlessly to produce electrical energy.
2- Condensed water can also be electrolyzed, and hydrogen can be used as fuel.
3- Condensation water can be used for our daily life.

Research resource:

https://climatescience.org/courses

https://youtu.be/5THr3bFj8Z

https://www.worldbank.org/en/news/feature/2012/06/18/rio-de-janeiro-to-fight-greenhouse-gas-emissions

https://www.un.org/ar/climatechange/what-is-climate-change

https://www.unep.org/ar/explore-topics/climate-change/about-tghyr-almnakh

https://climate.nasa.gov/solutions/adaptation-mitigation/

https://youtu.be/eON997EWVWA

https://www.consumernotice.org/environmental/pollution-reduction/