

LETTER FROM THE UNDER SECRETARY-GENERAL

First of all, I would like to welcome you all to the second annual session of Muharrem Hasbi Anatolian High School Model United Nations Conference. Nextly, I would like to introduce myself to you. I'm Doru Güleyen, I'm currently a tenth grader at Atakent Anatolian High School which is in Izmir. I am really happy that I'm coming to Balıkesir and I'm extremely excited that I will see you all again. It will be my greatest pleasure to serve you as the Under Secretary-General of Economic and Financial Affairs Council within these 3 days. I hope that all of my delegates will read the study guide and find it beneficial.

Sincerely,

Doru Güleyen

Under Secretary-General of ECOFIN

INTRODUCTION OF THE COMMITTEE

The Economic and Financial Affairs Council (ECOFIN) is responsible for EU policy in three main areas: economic policy, taxation issues and the regulation of financial services.

The Ecofin Council is made up of the economics and finance ministers from all member states. Relevant European Commissioners also participate in meetings.

There are also specific Ecofin sessions, attended by national budget ministers and the European Commissioner for financial programming and budget, to prepare the EU's annual budget.

Ecofin meetings generally take place **once a month**.

The Economic and Financial Affairs Council, commonly known as the Ecofin Council, is responsible for **economic policy, taxation matters, financial markets and capital movements**, and **economic relations** with countries outside the EU.

It also prepares the **EU's annual budget** and takes care of the legal and practical aspects of the **single currency, the euro**.

The Ecofin Council coordinates member states' economic policies, furthers the convergence of their economic performance and monitors their budgetary policies.

It also coordinates **EU positions for international meetings**, such as the G20, the International Monetary Fund and the World Bank. It is also responsible for the financial aspects of international negotiations on measures to tackle climate change.

KEY WORDS

Renewable Energy: Renewable energy is energy that has been derived from earth's natural resources that are not finite or exhaustible, such as wind and sunlight. Renewable energy is an alternative to the traditional energy that relies on fossil fuels, and it tends to be much less harmful to the environment.

Non-Renewable Energy: Non-Renewable Energy is energy that has some harmful effects on the environment. Natural Gas, Coal, Nuclear Energy and Oil are some examples for Non-Renewable Energy sources.,

Pollution: Pollution is something introduced into the environment that is dirty, unclean or has a harmful effect.

7 EXAMPLES OF RENEWABLE ENERGY SOURCES

1)Solar

Solar energy is derived by capturing radiant energy from sunlight and converting it into heat, electricity, or hot water. Photovoltaic (PV) systems can convert direct sunlight into electricity through the use of solar cells.



Benefits

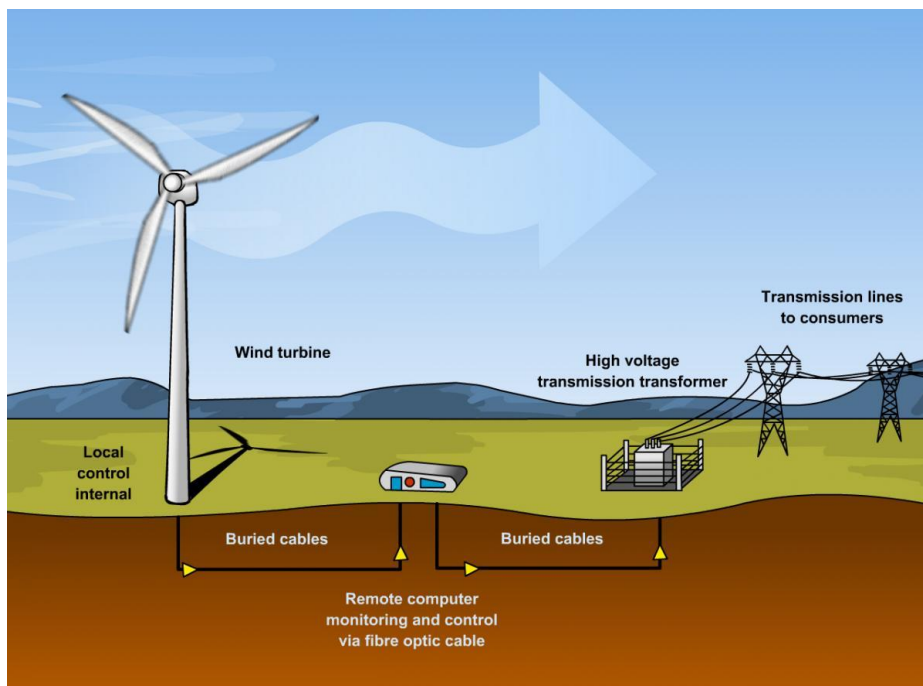
One of the benefits of solar energy is that sunlight is functionally endless. With the technology to harvest it, there is a limitless supply of solar energy, meaning it could render fossil fuels obsolete. Relying on solar energy rather than fossil fuels also helps us improve public health and environmental conditions. In the long term, solar energy could also eliminate energy costs, and in the short term, reduce your energy bills. Many federal local, state, and federal governments also incentivize the investment in solar energy by providing rebates or tax credits.

Current Limitations

Although solar energy will save you money in the long run, it tends to be a significant upfront cost and is an unrealistic expenses for most households. For personal homes, homeowners also need to have the ample sunlight and space to arrange their solar panels, which limits who can realistically adopt this technology at the individual level.

2)Wind

Wind farms capture the energy of wind flow by using turbines and converting it into electricity. There are several forms of systems used to convert wind energy and each vary. Commercial grade wind-powered generating systems can power many different organizations, while single-wind turbines are used to help supplement pre-existing energy organizations. Another form is utility-scale wind farms, which are purchased by contract or wholesale. Technically, wind energy is a form of solar energy. The phenomenon we call “wind” is caused by the differences in temperature in the atmosphere combined with the rotation of Earth and the geography of the planet.



Benefits

Wind energy is a clean energy source, which means that it doesn't pollute the air like other forms of energy. Wind energy doesn't produce carbon dioxide, or release any harmful products that can cause environmental degradation or negatively affect human health like smog, acid rain, or other heat-trapping gases. Investment in wind energy technology can also open up new avenues for jobs and job training, as the turbines on farms need to be serviced and maintained to keep running.

Current Limitations

Since wind farms tend to be built in rural or remote areas, they are usually far from bustling cities where the electricity is needed most. Wind energy must be transported via transition lines, leading to higher costs. Although wind turbines produce very little pollution, some cities oppose them since they dominate skylines and generate noise. Wind turbines also threaten local wildlife like birds, which are sometimes killed by striking the arms of the turbine while flying.

3)Hydroelectric

Dams are what people most associate when it comes to hydroelectric power. Water flows through the dam's turbines to produce electricity, known as pumped-storage hydropower. Run-of-river hydropower uses a channel to funnel water through rather than powering it through a dam.



Benefits

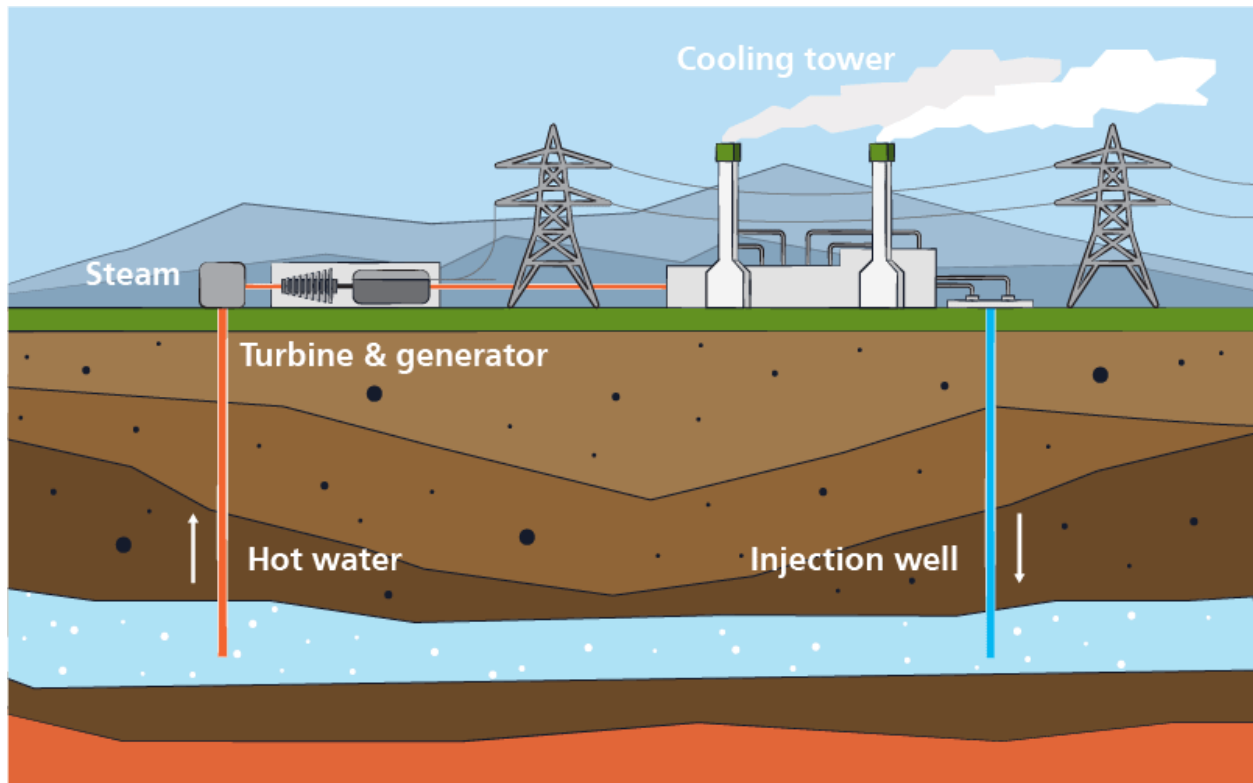
Hydroelectric power is very versatile and can be generated using both large scale projects, like the Hoover Dam, and small scale projects like underwater turbines and lower dams on small rivers and streams. Hydroelectric power does not generate pollution, and therefore is a much more environmentally-friendly energy option for our environment.

Current Limitations

Most U.S. hydroelectricity facilities use more energy than they are able to produce for consumption. The storage systems may need to use fossil fuel to pump water. Although hydroelectric power does not pollute the air, it disrupts waterways and negatively affects the animals that live in them, changing water levels, currents, and migration paths for many fish and other freshwater ecosystems.

4)Geothermal

Geothermal heat is heat that is trapped beneath the earth's crust from the formation of the Earth 4.5 billion years ago and from radioactive decay. Sometimes large amounts of this heat escapes naturally, but all at once, resulting in familiar occurrences, such as volcanic eruptions and geysers. This heat can be captured and used to produce geothermal energy by using steam that comes from the heated water pumping below the surface, which then rises to the top and can be used to operate a turbine.



Benefits

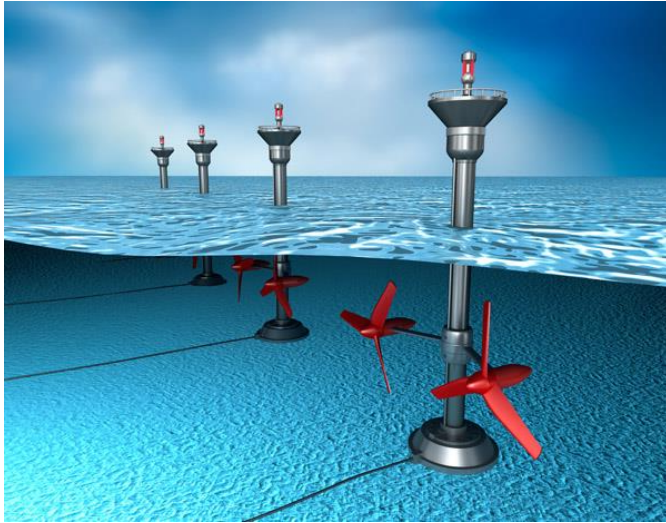
Geothermal energy is not as common as other types of renewable energy sources, but it has a significant potential for energy supply. Since it can be built underground, it leaves very little footprint on land. Geothermal energy is naturally replenished and therefore does not run a risk of depleting (on a human timescale).

Current Limitations

Cost plays a major factor when it comes to disadvantages of geothermal energy. Not only is it costly to build the infrastructure, but another major concern is its vulnerability to earthquakes in certain regions of the world.

5)Ocean

The ocean can produce two types of energy: thermal and mechanical. Ocean thermal energy relies on warm water surface temperatures to generate energy through a variety of different systems. Ocean mechanical energy uses the ebbs and flows of the tides to generate energy, which is created by the earth's rotation and gravity from the moon.



Benefits

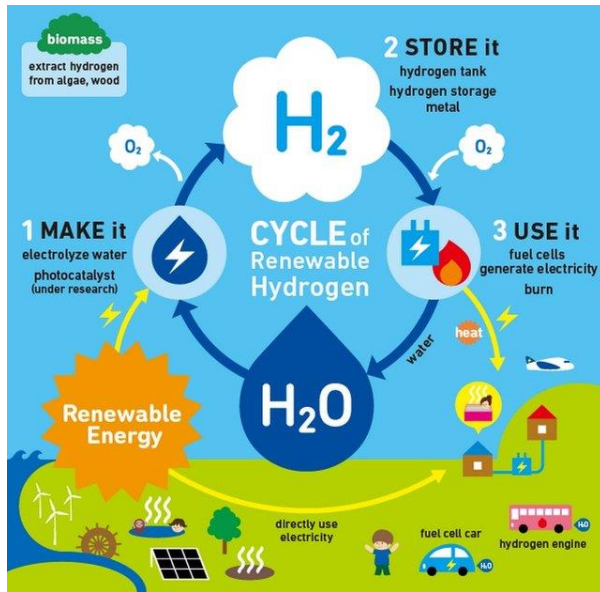
Unlike other forms of renewable energy, wave energy is predictable and it's easy to estimate the amount of energy that will be produced. Instead of relying on varying factors, such as sun and wind, wave energy is much more consistent. This type of renewable energy is also abundant, the most populated cities tend to be near oceans and harbors, making it easier to harness this energy for the local population. The potential of wave energy is an astounding as yet untapped energy resource with an estimated ability to produce 2640 TWh/yr. Just 1 TWh/yr of energy can power around 93,850 average U.S. homes with power annually, or about twice than the number of homes that currently exist in the U.S. at present.

Current Limitations

Those who live near the ocean definitely benefit from wave energy, but those who live in landlocked states won't have ready access to this energy. Another disadvantage to ocean energy is that it can disturb the ocean's many delicate ecosystems. Although it is a very clean source of energy, large machinery needs to be built nearby to help capture this form energy, which can cause disruptions to the ocean floor and the sea life that habitats it. Another factor to consider is weather, when rough weather occurs it changes the consistency of the waves, thus producing lower energy output when compared to normal waves without stormy weather.

6)Hydrogen

Hydrogen needs to be combined with other elements, such as oxygen to make water as it does not occur naturally as a gas on its own. When hydrogen is separated from another element it can be used for both fuel and electricity.



Benefits

Hydrogen can be used as a clean burning fuel, which leads to less pollution and a cleaner environment. It can also be used for fuel cells which are similar to batteries and can be used for powering an electric motor.

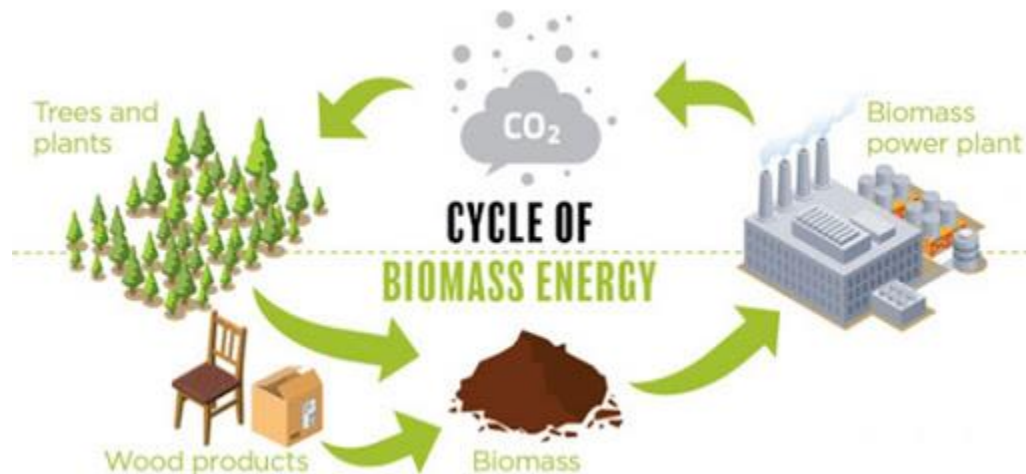
Current Limitations

Since hydrogen needs energy to be produced, it is inefficient when it comes to preventing pollution.

7)Biomass

Bioenergy is a renewable energy derived from biomass. Biomass is organic matter that comes from recently living plants and organisms. Using wood in your fireplace is an example of biomass that most people are familiar with.

There are various methods used to generate energy through the use of biomass. This can be done by burning biomass, or harnessing methane gas which is produced by the natural decomposition of organic materials in ponds or even landfills.



Benefits

The use of biomass in energy production creates carbon dioxide that is put into the air, but the regeneration of plants consumes the same amount of carbon dioxide, which is said to create a balanced atmosphere. Biomass can be used in a number of different ways in our daily lives, not only for personal use, but businesses as well. In 2017, energy from biomass made up about 5% of the total energy used in the U.S. This energy came from wood, biofuels like ethanol, and energy generated from methane captured from landfills or by burning municipal waste.

Non-Renewable Energy Sources

Non-renewable energy comes from sources that will run out or will not be replenished in our lifetimes—or even in many, many lifetimes.

Most non-renewable energy sources are fossil fuels: coal, petroleum, and natural gas. Carbon is the main element in fossil fuels. For this reason, the time period that fossil fuels formed (about 360-300 million years ago) is called the Carboniferous Period.

All fossil fuels formed in a similar way. Hundreds of millions of years ago, even before the dinosaurs, Earth had a different landscape. It was covered with wide, shallow seas and swampy forests.

Plants, algae, and plankton grew in these ancient wetlands. They absorbed sunlight and created energy through photosynthesis. When they died, the organisms drifted to the bottom of the sea or lake. There was energy stored in the plants and animals when they died.

Over time, the dead plants were crushed under the seabed. Rocks and other sediment piled on top of them, creating high heat and pressure underground. In this environment, the plant and animal remains eventually turned into fossil fuels (coal, natural gas, and petroleum). Today, there are huge underground pockets (called reservoirs) of these non-renewable sources of energy all over the world.

Advantages and Disadvantages

Fossil fuels are a valuable source of energy. They are relatively inexpensive to extract. They can also be stored, piped, or shipped anywhere in the world.

However, burning fossil fuels is harmful for the environment. When coal and oil are burned, they release particles that can pollute the air, water, and land. Some of these particles are caught and set aside, but many of them are released into the air.

Burning fossil fuels also upsets Earth's "carbon budget," which balances the carbon in the ocean, earth, and air. When fossil fuels are combusted (heated), they release carbon dioxide into the atmosphere. Carbon dioxide is a gas that keeps heat in Earth's atmosphere, a process called the "greenhouse effect." The greenhouse effect is necessary to life on Earth, but relies on a balanced carbon budget.

The carbon in fossil fuels has been sequestered, or stored, underground for millions of years. By removing this sequestered carbon from the earth and releasing it into the atmosphere, Earth's carbon budget is out of balance. This contributes to temperatures rising faster than organisms can adapt.

1)Coal

Coal is a black or brownish rock. We burn coal to create energy. Coal is ranked depending on how much “carbonization” it has gone through. Carbonization is the process that ancient organisms undergo to become coal. About 3 meters (10 feet) of solid vegetation crushed together into .3 meter (1 foot) of coal!

Peat is the lowest rank of coal. It has gone through the least amount of carbonization. It is an important fuel in areas of the world including Scotland, Ireland, and Finland.

Anthracite is the highest rank of coal. Anthracite forms in regions of the world where there have been giant movements of the earth, such as the formation of mountain ranges. The Appalachian Mountains, in the eastern part of the United States, are rich in anthracite.

We mine coal out of the ground so we can burn it for energy. There are two ways that we can mine coal: underground mining and surface mining.

Underground mining is used when the coal is located below the surface of the Earth, sometimes 300 meters (1,000 feet) deep—that’s deeper than most of the Great Lakes! Miners take an elevator down a mineshaft. They operate heavy machinery that cuts the coal out of the Earth and brings it above ground. This can be dangerous work because cutting coal can release dangerous gases. The gases can cause explosions or make it hard for miners to breathe.

Surface mining is used when the coal is located very near the surface of the earth. To get to the coal, companies must first clear the area. They take away the trees and soil. The coal can then be cut out of the ground more easily. Entire habitats are destroyed during this process.

About half the electricity in the United States comes from coal. It gives power to our lights, refrigerators, dishwashers, and most other things we plug in. When coal is burned, it leaves “byproducts” that are also valuable. We use the byproducts to make cement, plastics, roads, and many other things.

Advantages and Disadvantages

Coal is a reliable source of energy. We can rely on it day and night, summer and winter, sunshine or rain, to provide fuel and electricity.

Using coal is also harmful. Mining is one of the most dangerous jobs in the world. Coal miners are exposed to toxic dust and face the dangers of cave-ins and explosions at work.

When coal is burned, it releases many toxic gases and pollutants into the atmosphere. Mining for coal can also cause the ground to cave in and create underground fires that burn for decades at a time.

2)Petroleum

Petroleum is a liquid fossil fuel. It is also called oil or crude oil.

Petroleum is trapped by underground rock formations. In some places, oil bubbles right out of the ground. At the LaBrea Tar Pits, in Los Angeles, California, big pools of thick oil bubble up through the ground. Remains of animals that got trapped there thousands of years ago are still preserved in the tar!

Most of the world's oil is still deep under the ground. We drill through the earth to access the oil. Some deposits are on land, and others are under the ocean floor.

Once oil companies begin drilling with a "drill rig," they can extract petroleum 24 hours a day, seven days a week, 365 days a year. Many successful oil sites produce oil for about 30 years. Sometimes they can produce oil for much longer.

When oil is under the ocean floor, companies drill offshore. They must build an oil platform. Oil platforms are some of the biggest manmade structures in the world!

Once the oil has been drilled, it must be refined. Oil contains many chemicals besides carbon, and refining the oil takes some of these chemicals out.

We use oil for many things. About half of the world's petroleum is converted into gasoline. The rest can be processed and used in liquid products such as nail polish and rubbing alcohol, or solid products such as water pipes, shoes, crayons, roofing, vitamin capsules, and thousands of other items.

Advantages and Disadvantages

There are advantages to drilling for oil. It is relatively inexpensive to extract. It is also a reliable and dependable source of energy and money for the local community.

Oil provides us with thousands of conveniences. In the form of gasoline, it is a portable source of energy that gives us the power to drive places. Petroleum is also an ingredient in many items that we depend on.

However, burning gasoline is harmful to the environment. It releases hazardous gases and fumes into the air that we breathe. There is also the possibility of an oil spill. If there is a problem with the drilling machinery, the oil can explode out of the well and spill into the ocean or surrounding land. Oil spills are environmental disasters, especially offshore spills. Oil floats on water, so it can look like food to fish and ruin birds' feathers.

3)Natural Gas

Natural gas is another fossil fuel that is trapped underground in reservoirs. It is mostly made up of methane. You may have smelled methane before. The decomposing material in landfills also release methane, which smells like rotten eggs.

There is so much natural gas underground that it is measured in million, billion, or trillion cubic meters.

Natural gas is found in deposits a few hundred meters underground. In order to get natural gas out of the ground, companies drill straight down. However, natural gas does not form in big open pockets. Natural gas is trapped in rock formations that can stretch for kilometers.

To reach natural gas, some companies use a process called “hydraulic fracturing,” or fracking. Hydraulic means they use water, and fracturing means to “split apart.” The process uses high-pressure water to split apart the rocks underground. This releases the natural gas that is trapped in rock formations. If the rock is too hard, they can send acid down the well to dissolve the rock. They can also use tiny grains of glass or sand to prop open the rock and let the gas escape.

We use natural gas for heating and cooking. Natural gas can also be burned to generate electricity. We rely on natural gas to give power to lights, televisions, air conditioners, and kitchen appliances in our homes.

Natural gas can also be turned into a liquid form, called liquid natural gas (LNG). LNG is much cleaner than any other fossil fuels.

Liquid natural gas takes up much less space than the gaseous form. The amount of natural gas that would fit into a big beach ball would fit into a ping-pong ball as a liquid! LNG can be easily stored and used for different purposes. LNG can even be a replacement for gasoline.

Advantages and Disadvantages

Natural gas is relatively inexpensive to extract, and is a “cleaner” fossil fuel than oil or coal. When natural gas is burned, it only releases carbon dioxide and water vapor (which are the exact same gases that we breathe out when we exhale!) This is healthier than burning coal.

However, extracting natural gas can cause environmental problems. Fracturing rocks can cause mini-earthquakes. The high-pressure water and chemicals that are forced underground can also leak to other sources of water. The water sources, used for drinking or bathing, can become contaminated and unsafe.

Other Non-renewable Energy Sources

Fossil fuels are the leading non-renewable energy sources around the world. However, There are others.

4)Nuclear Energy

Nuclear energy is usually considered another non-renewable energy source. Although nuclear energy itself is a renewable energy source, the material used in nuclear power plants is not.

Nuclear energy harvests the powerful energy in the nucleus, or core, of an atom. Nuclear energy is released through nuclear fission, the process where the nucleus of an atom splits. Nuclear power plants are complex machines that can control nuclear fission to produce electricity.

The material most often used in nuclear power plants is the element uranium. Although uranium is found in rocks all over the world, nuclear power plants usually use a very rare type of uranium, U-235. Uranium is a non-renewable resource.

Nuclear energy is a popular way of generating electricity around the world. Nuclear power plants do not pollute the air or emit greenhouse gases. They can be built in rural or urban areas, and do not destroy the environment around them.

However, nuclear energy is difficult to harvest. Nuclear power plants are very complicated to build and run. Many communities do not have the scientists and engineers to develop a safe and reliable nuclear energy program.

Nuclear energy also produces radioactive material. Radioactive waste can be extremely toxic, causing burns and increasing the risk for cancers, blood diseases, and bone decay among people who are exposed to it.

USAGE OF RENEWABLE ENERGY INSTEAD OF NON-RENEWABLE ENERGY

Usage of renewable energy is less harmful and useful for our world. Non-Renewable energy types are mostly fossil fuels. Fossil fuels have a lot of harmful effects on the environment such as water pollution, air pollution etc. Fossil fuels should be replaced with renewable energy sources as soon as possible. It is correct that some of the fossil fuels are cheaper to use and they give more energy. The problem of using them starts with not using filter systems in factories. The filter decreases most of the harmful effects of fossil fuels but that does not change the fact that they are still harmful to the environment. Fossil fuels are not only being used by the factories. They are being used with transportation services as well. Most of the cars, planes etc. are using fossil fuels to provide the energy source that they need. They should be changed with renewable energy sources as well.

TYPES OF POLLUTION CAUSED BY FOSSIL FUELS

Air Pollution

Burning fossil fuels emits a number of air pollutants that are harmful to both the environment and public health.

Sulfur dioxide (SO₂) emissions, primarily the result of burning coal, contribute to acid rain and the formation of harmful particulate matter. In addition, SO₂ emissions can exacerbate respiratory ailments, including asthma, nasal congestion, and pulmonary inflammation. In 2014, fossil fuel combustion at power plants accounted for 64 percent of US SO₂ emissions .

Nitrogen oxides (NO_x) emissions, a byproduct of all fossil fuel combustion, contribute to acid rain and ground-level ozone (smog), which can burn lung tissue and can make people more susceptible to asthma, bronchitis, and other chronic respiratory diseases. Fossil fuel-powered transportation is the primary contributor to US NO_x emissions.

Acid rain is formed when sulfur dioxide and nitrogen oxides mix with water, oxygen, and other chemicals in the atmosphere, leading to rain and other precipitation that is mildly acidic. Acidic precipitation increases the acidity of lakes and streams, which can be harmful to fish and other aquatic organisms. It can also damage trees and weaken forest ecosystems.

Coal-fired power plants are the largest source of mercury emissions to the air in the United States. As airborne mercury settles onto the ground, it washes into bodies of water where it accumulates in fish, and subsequently passes through the food chain to birds and other animals. The consumption of mercury-laden fish by pregnant women has been associated with neurological and neurobehavioral effects in infants. Young children are also at risk.

A number of studies have sought to quantify the health costs associated with fossil fuel-related air pollution. The National Academy of Sciences assessed the costs of SO₂, NO_x, and particulate matter air pollution from coal and reported an annual cost of \$62 billion for 2005 — approximately 3.2 cents per kilowatt-hour (kWh).. A separate study estimated that the pollution costs from coal combustion, including the effects of volatile organic compounds (VOCs) and ozone, was approximately \$187 billion annually, or 9.3 cents per kWh.

A 2013 study also assessed the economic impacts of fossil fuel use, including illnesses, premature mortality, workdays lost, and direct costs to the healthcare system associated with emissions of particulates, NO_x, and SO₂. This study found an average economic cost (or “public health added cost”) of 32 cents per kWh for coal, 13 cents per kWh for oil, and 2 cents per kWh for natural gas. While cost estimates vary depending on each study’s scope and assumptions, together they demonstrate the significant and real economic costs that unpriced air emissions impose on society.

Fossil fuel transportation emissions represent the largest single source of toxic air pollution in the U.S., accounting for over a third of carbon monoxide (CO) and NO_x emissions.

Water Pollution

Airborne nitrogen pollution affects not only the quality of the air we breathe, but also the land and the water. Nitrogen is the most abundant element in the air and is essential to plant and animal life. Sources of nitrogen from human activities, such as electric power generation, industry, transportation and agriculture, can upset the natural balance of nitrogen in the environment.

When fossil fuels are burned, they release nitrogen oxides into the atmosphere, which contribute to the formation of smog and acid rain. The most common nitrogen-related compounds emitted into the air by human activities are collectively referred to as nitrogen oxides. Ammonia is another nitrogen compound emitted to the air, primarily from agricultural activities, but also from fossil fuels. Most of the nitrogen oxides released in the U.S. due to human activity are from the burning of fossil fuels associated with transportation and industry.

Major sources of nitrogen oxide emissions include:

- Cars and trucks
- Coal-fired power plants
- Large industrial operations
- Ships and airplanes

The presence of excess nitrogen in the atmosphere in the form of nitrogen oxides or ammonia is deposited back onto land, where it washes into nearby water bodies. These excess nutrients contribute to pollution, harmful algal blooms and oxygen-deprived aquatic zones. Excess ammonia and low pH in these areas are toxic to aquatic organisms and affect their survival.

QUESTIONS TO PONDER

- What can be done to decrease the effects of fossil fuels to the environment?
- What can be used instead of fossil fuels?
- How can we inform the manufacturers about the harmful effects of fossil fuels to the environment?
- How can we inform the society about the harmful effects of fossil fuels to the environment?
- How can we encourage the society to use renewable energy sources instead of non-renewable energy sources?
- What can be done to decrease the effects of air and water pollution which are caused by the usage of non-renewable energy sources
- What can be done about the transportation systems which are using fossil fuels?
- Which United Nations Bodies should be involved in this problem? How?
- Which NGOs can help the member states upon this problem?
- Is it safe to use nuclear energy?

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