

Effect of Renewable Energy on Green House Effect and Environment : A Study

Ravi Prakash Maheshvari, Akhil Nema

Civil Engineering Department, Govt. Engineering College Banswara, Raj. (India)

Corresponding Author: rpmaheshvari@gmail.com

Abstract : Our earth is enclosed by the cover of some gases which retains the heat of rays coming from the sun which increases the the temperature of the earth, this process is called as Green House Effect. This effect increases the temperature and creates some problems like global warming, skin diseases and sea level rise. Renewable energy is basically generated from renewable resources such as wind, rain, tides, waves, sunlight, geothermal that is collected from renewable resources. Renewable energy often provides energy in four important areas electricity generation, air heating and water heating cooling, transportation, and rural energy services. In this study, it is observed that the renewable energy may be a good solution for the harmful and dangerous effects of greenhouse gases.

Keywords: Renewable Energy, Green House Effect, Environment, Solar, Wind, Global Warming.

1 Introduction

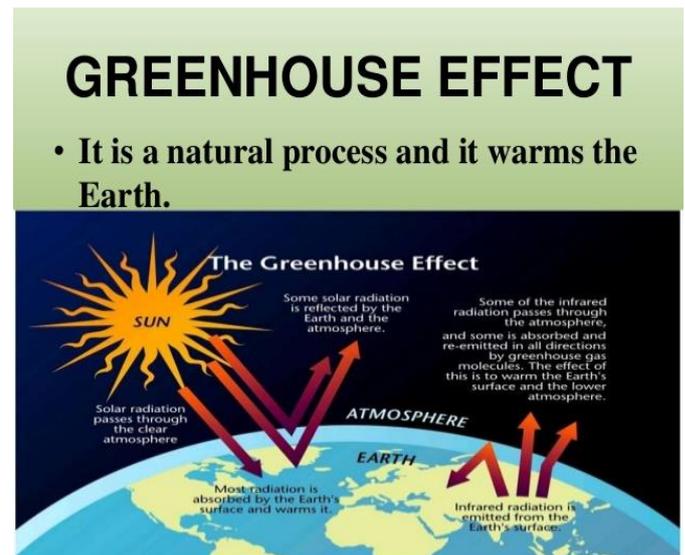
In our society the production and consumption of electricity is increasing day by day because it has become the major requirement for us. There are more ways in which we are using that electricity such as television, computers, refrigeration etc. This electric energy is producing by coal, diesel and many renewable sources such as solar, wind, biomass etc. Today fossil fuels are the major input for the production of the electricity which are emitting some harmful agents to the environment like carbon dioxide and methane. Refrigeration and burning of fossil fuels gives chlorofluoro carbon type harmful chemicals to the environment. These harmful chemicals and agents are the main causes of environment degradation and Green House Effect.

A greenhouse gas is a agent which emits and An environmental gas which emits and absorbs radiant energy within the thermal infrared range is a greenhouse gas. This creates the greenhouse effect. The primary gases in Earth's atmosphere responsible for greenhouse effect are water vapour, carbon dioxide, methane, nitrous oxide, and ozone. The present average temperature is 15⁰c while it would be - 18⁰c without these gases. All the energy generation and consumption processes and human activities has created that the atmospheric concentration of carbon dioxide (CO₂), from 280 ppm in 1750 to 406 ppm in early 2017. The bulk of harmful carbon dioxide emissions appear from combustion of fossil fuels,

primarily coal, oil, and natural gas, with relatively modest supplementary assistance coming from deforestation, changes in land exploit, soil erosion, and farming.

If the emissions of green house gases will rise continuously at the present rate then it is estimated that the temperature will

increase chronologically till 2047 with dangerous and injurious effects on humans, plants and bio life.



Some researchers studied and said that humans are responsible for global warming and green house effects because deforestation and fossil fuel combustion emits the carbon dioxide and other gases which are increasing temperature of environment and magnitude of green house gases, this process is known as Green House Effect. This effect is warming the earth surface and affecting the environment. Major green house gases are carbon dioxide, methane and nitrous oxide. The contribution of green house gases in atmosphere are as follows.

Compound	Formula	Concentration in atmosphere (ppm)	Contribution
Water vapour and clouds	H ₂ O	10-50,000	36-72%
Carbon dioxide	CO ₂	400	9-26%
Methane	CH ₄	1.8	4-9%
Ozone	O ₃	2.8	3-7%

When the temperature increases the concentration of greenhouse gases is increase. This increment in temperature is due to combustion of fossil fuels, refrigeration and power generation in power plants.

The concentrations of carbon dioxide, methane, and nitrous oxide are all known to be increasing and in recent year, so their greenhouse gases, principally chlorofluorocarbons (CFCs), have been added in significant quantifies to the atmosphere.

Noam lior (2008) studied on renewable energy about the present situation and future demand. In that research the work was about the recent estimates and forecasts about the oil, gas and coal resources and their reserve/production ratio, nuclear and renewable energy potential. The work is also consisting of impact of rapidly growing economies of highly populated countries and the effect of global warming is also discussed. The research work concluded that the ways to resolve the problem of the availability, cost and sustainability of energy resources alongside the rapidly rising demand.

Joshua M. Pearce (2012) reviewed and analysed the challenges that nuclear power must overcome in order to be considered sustainable in this paper. This study comprises of the limitations of nuclear energy as a sustainable energy resource. So, this study concluded that if the fossil fuel combustion is replaced by nuclear energy then it is required to improve the technology to reduce greenhouse gas emissions. The technology should improve to diminish the risk in adopting the nuclear energy. The radioactive disposal that is harmful to the environment should be minimise for the duration of mining and other works. The elimination of radioactive disposal that is harmful to the environment should be minimise for the duration of mining and other works. The technology should be improving at that level where the public should have trust on nuclear industry on basis of technologies and financial performance.

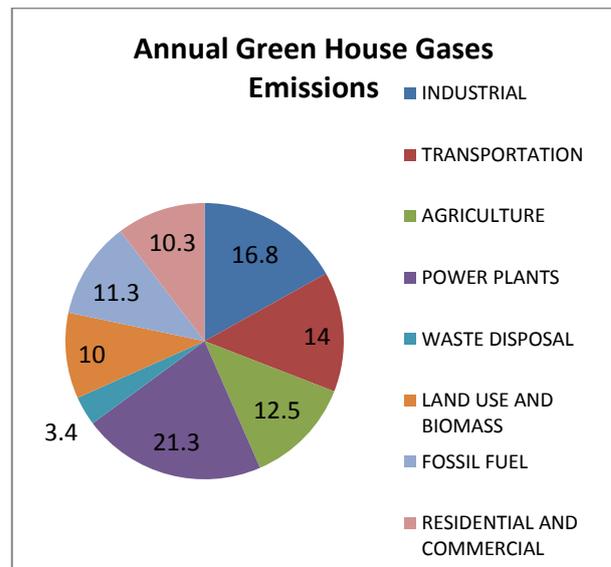
Bjorn Ulsterman et al. (2007), studied in this work on evaluation of greenhouse gas emissions from organic and conventional systems using carbon cycle model. The work in this paper explain the knowledge about carbon and nitrogen in soil-plant-animal-environment system. In this research, soil is used for the calculation of carbon, fossil energy is used for the emission of carbon dioxide, farm animals is used for the emission of methane and again soil is used for the emission of nitrus oxide. The specific global warming potential is used in this work for converting the results into carbon dioxide equivalents.

Y.S. Mohammed, et al. (2012) has studied in this article and presented that the effect of human made energy generation sources will be dangerous in future because they are emitting the greenhouse gases in large magnitude. This work also gives a considerable information about energy utilization circumstances and intimidating complicated energy context and said that it will become worrying incident worldwide after sometime. Some reduction techniques by using renewable energy and control measures are also discussed in this article.

2 SOURCES OF GREEN HOUSE GASES

There are various greenhouse gases are Water vapor (H₂O), Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Ozone (O₃), Chlorofluorocarbons (CFCs). There are various sources of these greenhouse gases. That are natural systems and human activities, human activities are the energy production, transformation and consumption. The fraction of an emission left behind in the atmosphere after a particular time is the "Airborne Fraction" (AF). The yearly AF is the ratio of the atmospheric rise in a given year to that year's total emissions. The percentage contribution of the greenhouse gases to the greenhouse effect on earth the four major gases are: carbon dioxide 9–26%, methane, 4–9%, water vapour 36–70%, ozone 3–7%.

The percentages of annual greenhouse gases are shown in fig.



2.1 Impact of Green House Effect On Environment

• Global Warming

If the greenhouse gases concentration increases then reduction in outgoing infrared radiation occurs, thus the Earth's climate would change this "climatic change" is called as "global warming" of the Earth's surface and the subordinate atmosphere as warming up. Nevertheless, a small increase in temperature will bring many other changes such as cloud cover and wind patterns. Some of these changes may be work to boost the warming. Based on some research the "Intergovernmental Panel on Climate Change" in their third assessment report has forecast that global mean surface temperature will rise by 1.4°C to 5.8°C by the end of 2100. This protrusion takes into explanation the effects of aerosols which tend to cool the climate as well as the delaying effects of the oceans which have a large thermal capacity.

• Sea Level Rise

If global warming occurs, sea level will go up due to two different processes. Firstly, warmer temperature grounds sea level to rise due to the thermal expansion of seawater. Secondly, water from melting glaciers and the ice of Greenland and the Antarctica would also add water to the ocean. It is forecasted that the Earth's common sea level will rise by 0.09 to 0.88 m between 1990 and 2100.

• Impact on Human Life

Over half of the human population lives within 100 kilometres of the sea. Most of this population lives in urban areas that serve as seaports. A measurable rise in sea level will have a severe economic impact on low lying coastal areas and islands, for examples, increasing the beach erosion rates along coastlines, rising sea level displacing fresh groundwater for a substantial distance inland. Experiments have shown that with higher concentrations of CO₂, plants can grow bigger and faster. However, the effect of global warming may affect the atmospheric general circulation and thus altering the global precipitation pattern as well as changing the soil moisture contents over various continents.

• Impact on Aquatic systems

Due increment in temperature the wetlands are reduced so the population of marine species are reduced. Nevertheless, the full impact on aquatic species is not known.

• Impact on Hydrological Cycle

Rise in temperature increases evaporation that creates more rainfall. In some regions there is a great rainfall while in few areas there is no rainfall. So, these fluctuations may increase the global precipitation.

3. RENEWABLE ENERGY AND RESOURCES

Renewable energy resources are scattered exist in excess of wide geological areas than other energy resources which are intense in few countries. Now a day's quick consumption of renewable energy resources is necessary because they are renewable. The results of a recent review of the literature concluded that as greenhouse gas (GHG) emitters begin to be held liable for damages resulting from GHG emissions resulting in climate change, a high value for liability mitigation would provide powerful incentives for deployment of renewable energy technologies. In worldwide survey of public analysis show that most of the civilian are in support of renewable energy sources. More than 30 countries are using more than 20% of their energy supply as a renewable energy. Two nations that are Norway and Iceland are making their full energy by using renewable energy sources and some other countries are preparing for renewable energy for their energy supply.

Earlier to the growth of coal in the middle of the 19th century almost all energy used was renewable. Almost without a doubt the oldest known use of renewable energy in the form of traditional biomass to fuel fires dates from 7,90,000 years ago. Use of biomass for hearth failed to become common place till several many thousands of years later someday between a pair of, 2,00,000 and 4,00,000 years past in all probability the second oldest tradition of renewable energy is harnessing the wind so as to steer ships higher than water. In past time the human labour, animal power, water power and wind were the renewable resources. Renewable energy resources may be some natural resources like that Sun's electromagnetic radiation, tides or heat generation inside the Earth. Following are the main renewable energy resources:

- **Solar energy** the radiation of the sun is captured in solar panels that are exposed to sunlight. The sunlight can be changed into electrical energy to power all the appliances in a home. It can also be used to heat a house and to create hot water. There are also some drawbacks in solar energy system that they consume some more space for their arrangement and the collection of energy completely depends upon whether conditions.
- **Wind power** it is energy derived from the movement of the wind. The most recognizable example of wind power is the windmill, which is using for crushing the grain. This principle is also using in generation of electricity using turbine that is known as wind turbine. Wind is a very hygienic resource of energy, but it requires large space and occasionally noisy blades to work.
- **Biomass energy** when the plant material and animal excreta is burnt then there was the emission of biomass energy. Biomass comes from freshly livelihood organisms, not the old materials that form fossil fuels.
- **Geothermal energy** The Earth's interior is extremely hot—hot enough to melt the rock that comes out of a volcano in the form of lava. That heat creates hot water and steam below the Earth's surface, which can be harnessed by digging a well. As the steam or water rises, it can be used to run a turbine and create electricity.

- **Hydropower** is energy captured from the movement of water. It is sometimes called hydroelectric power because the water is used to turn turbines that create electricity. The hydropower energy is a fresh and fine source of energy that creates about no pollution but it may cause changes to the surrounding atmosphere that can influence animals and plants.



3.1 Advantages of Renewable Energy

1. First main advantage of renewable energy is that it is renewable it is therefore durable and so it will never run out.
2. Renewable energy services normally need not as much of maintenance than conventional power generators. Their fuel being brought from natural and available resources that reduces the expenditure of action.
3. Even more importantly, renewable energy produces little or no waste products such as carbon dioxide or other chemical pollutants, so has minimal impact on the environment.
4. Renewable energy projects can also bring economic benefits to many regional areas, as most projects are located away from large urban centres and suburbs of the capital cities.

3.2 Disadvantages of Renewable Energy

5. First main drawback of renewable energy that it is not easy to produce the energy in bulk as great as those generated by conventional fossil fuel generators. Because the consumption is more than the production in our society. For proper maintenance there should be a perfect balance in various sources of energy.
6. Another difficulty in renewable energy resources is that this energy depends on whether conditions. For example, flowing water is required to operate the hydro generators and wind is required to operate the wind turbines. The present cost of renewable energy is more than conventional energy generators.
7. The production of renewable energy is required more space and for collection it requires the particular location that means if we want to take more benefits of renewable energy we have to construct a whole arrangement of network. And these arrangements of network require burning the fossil fuels that ultimately emits the greenhouse gases.

ROLE OF RENEWABLE ENERGY IN REDUCTION OF GREEN HOUSE GASES AND CONTROL MEASURES

1. No Damage to Environment while Extracting

Major energy resources used for power generation are extracted from the core of the planet. This includes oil, gas, or coal. Large amounts of those resources square measure extracted, and it wants a lot of exploitation of the mother Earth. This results in increase in expenses due to constant drilling. This lead to the discharge of hepatotoxic gases into the atmosphere that becomes damaging for nature additionally as humans. However, on the opposite hand, the renewable-energy sources square measure simply obtained, and that they don't unleash any harmful gases.

2. Reduction in Carbon Emission

If we use the conventional energy resources the carbon dioxide emission increases in the environment. On the other hand, if we use the renewable sources for energy the emission of carbon dioxide drastically reduces. The renewable energy is nearby in great quantity only wants right technology and infrastructure. Some researchers said that conventional power generation resources emit nearly 40% of the carbon dioxide. Which is destructive to the atmosphere.

3. Helps in reducing Global Warming

The renewable-energy resources facilitate for reducing the global warming as it reduces the quantity of greenhouse gases emission to the environment that is major contributing factor to it. The renewable energy sources will help in eliminating the emission of poisonous gases.

4. Sustaining the Renewable-Energy Sources

It is very important to keep up the renewable-energy resources because these are facilitating in generating the fresh and clean energy which is very important and useful for the environment now a day. For this, the government ought to expect to the correct infrastructure and technological improvement which will facilitate them to sustain for longer. Moreover, the property can facilitate in handling several environmental problems regarding fuel depletion, emission of dioxide and alternative threatening problems.

5. Decreases the Adverse Environmental Impacts

The renewable energy is a clean type of energy on the other hand another conventional type of resources is giving the harmful and injurious environment. So, we should have to go for renewable energy because by using this energy we can keep our country green and clean.

The world is growing on daily basis more and more so the individual requires the utilization of the electricity at residence or industrialized establishments. So, it is the best time to about turn from conventional resources to the renewable resources feel the clean and green environment.

8. CONCLUSION

This research study concluded that energy production, transformation and consumption are the main reasons of greenhouse gases emission and global warming that are very harmful and adverse to human life. This study has also shown that the energy production, transformation and consumption are the major source of greenhouse gas emission actually and human actions are the minor sources. It is clear from this work that these gases and agents are very harmful to us so application of renewable energy is the best option for reducing the effects of these harmful agents to the environment. Ultimately, it is required to increase the uses of renewable energy utilization to solve the problems of energy safety, energy loss and health related issues.

The earth is enclosed by a cover of gases, which allows the energy from the sun to reach the earth's surface and temperate it. The majority of the heat is reflected back to space but some part of gases is retained by the atmosphere that increases the temperature of the earth so the gases which retain the heat in atmosphere is called as greenhouse gases and this effect is known as greenhouse effect. So, this increment in temperature results some problems to environment such as global warming, melting of ice and sea level rise etc. By using the renewable energy like solar, wind, biomass and hydropower etc. we can reduce the effect of greenhouse problems and can give the healthy and joyful environment to the coming generation.

9. REFERENCES

- i. Pooja T. Latake, Pooja Pawar, Anil C Ranveer, 2015, "The Greenhouse Effect and Its Impacts on Environment", *International Journal of Innovative Research and Creative Technology, IJIRCT, ISSN: 2454-5988, (2015)/ IJIRCT1201068.*
- ii. Bjorn Kustermann, Maximilian Kainz, Kurt-Jurgen Hulsbergen, 2007, "Modeling carbon cycles and estimation of greenhouse gas emissions from organic and conventional farming systems", *Renewable Agriculture and Food Systems: 23(1); 38-52, 30 July 2007.*
- iii. Noam Lior, 2008, "Energy Resources and Use: The Present Situation and Possible Paths to The Future, *Journal of Energy, Elsevier Publication, Energy 33, 842-857, doi:10.1016/j.energy.2007.09.009.*
- iv. Joshua M. Pearce, 2012, "Limitations of Nuclear Power as a Sustainable Energy Source", *Journal of Sustainability, ISSN 2071-1050, 4, 1173-1187; doi:10.3390/su4061173.*
- v. Y.S. Mohammed, A.S. Mokhtar, N. Bashir, U.U. Abdullahi, S.J. Kaku, U. Umar, 2012, "A Synopsis on the Effects of Anthropogenic Greenhouse Gases Emissions from Power Generation and Energy Consumption", *International Journal of Scientific and Research Publications, ISSN 2250-3153, 1-7, 10, October, 2012.*
- vi. Scott Canonico, Royston Sellman, Chris Preist, 2009 "Reducing the Greenhouse Gas Emissions of Commercial Print with Digital Technologies," *International Symposium on Sustainable Systems and Technology (ISSST), 1-8.*
- vii. Arman Shehabi, Ben Walker and Eric Masanet, 2014, "The energy and greenhouse-gas implications of internet video streaming in the United States", *Environ. Res, 1-11.*
- viii. WWW. History of greenhouse gases, (http://en.wikipedia.org/wiki/Greenhouse_gas)
- ix. Greenhouse effect – Wikipedia.com.
- x. Renewable energy – Wikipedia.com.