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# ALTERNATIVE ENERGY SOURCES AND GREEN TECHNOLOGY

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**Abstract**
This paper presents a review of the green technologies and processes for the development of the renewable energyresources.Renewableenergyresourcesholdgreatpromiseformeetingtheenergyanddevelopmentneedsthroughout the world. This promise is particularly strong for developing countries where many regions have not yetcommitted to fossil fuel dominance. Solar photovoltaic and solar thermal technologies are particularly advantageousfor serving the two billion people in rural areas without grid electricity. Modern biomass energy is attractive becauseituseslocallyavailableagriculturalwastes.Windenergyandsmallhydroelectricresourcesarealsomaturetechnologies well suited to developing countries. Such renewable resources are far more economical than traditionalenergy resources, especially where the costs of acquiring, maintaining, and operating centralized power stations andremediating their pollution can be avoided. However, a host of economic, social, and legal barriers prevent theserenewableresourcesfromreachingtheirfullpotential.
**Keywords:-**RenewableEnergyResources,GreenHouseEffect,SolarEnergy,GenerationsofTechnologies;

## 1.INTRODUCTION

Alternative energy (sometimes known as renewable energy) refers to a wide range of power generation options. Electricity obtained from renewable resources such as solar or wind energy, as opposed to single-use resources such as coal or uranium, is referred to as renewable energy. Solar power, wind power, and hydro power are the most prevalent kinds of alternative energy available to homeowners today. Nonrenewable energy sources were the primary energy sources in the twentieth century. These includes

- Fossilfuels
- Coal
- Oil
- Naturalgas
- Nuclearenergy

Nonrenewable energy sources have two major

drawbacks: limited supply and pollution. The combustion of fossil fuels produces a large amount of carbon dioxide (CO2), a greenhouse gas. This is most likely the primary cause of the recent rise in global temperatures. Nuclear power facilities, on the other hand, are not harmful to the environment, but the compounds formed as a result of nuclear reactions are radioactive for years and must be stored in specific chambers. Renewable energy sources, on the other hand, are unaffected by any of these issues. The following are the most important renewable energy sources:

- Windenergy
- Solarenergy
- Bioenergy
- Hydroenergy

Renewable energy sources do not pollute environment in the same extent that non-renewable do, but they are also not fully clean. This primarily affects biomass energy, which has the same effect as fossil fuels in terms of CO2 emissions when burned, but the carbon circle is at least closed in that case.

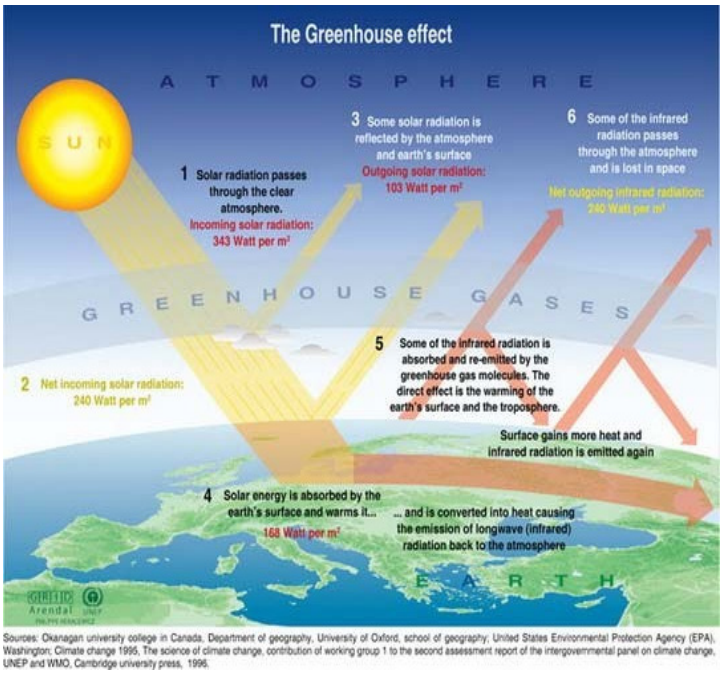

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Fig. 1

The expense and small volume of renewable energy sources (water energy excluded) are the two biggest issues, of newly acquired energy Renewable energy

sources have enormous promise, but our current technological advancement prevents us from solely relying on them. The "Greenhouse Effect" is seen in this image. The earth reflects some of the sun's reflected radiation as greenhouse gases (CO2, N2O, CH4, HFC, PFC, and SF6), and this effect is responsible for Earth's temperatures. Due to the increasing concentration of CO2 during the last century, greenhouse effects have been strengthening over the period. As a result, the average temperature of the Earth rises globally. Ice melting, rising sea levels, agriculture impacts, and so on are all consequences of global warming. If the greenhouse effect did not exist, the earth's temperature would be approximately 30°C lower than it is now. Wood and biomass burning, deforestation, and fossil fuel combustion are all major producers of CO2.

## 2.GENERATIONSOFRENEWABLEENERGY-TECHNOLOGIES

The phrase renewable energy covers a multitude of sources and technologies at different stages of development. Over the decades, the International Energy Agency (IEA) has defined three generations of renewable energy technologies:

Hydropower, biomass combustion, geothermal power, and heat are examples of first-generation technologies that developed from the industrial revolution at the end of the 19th century. These technologies are extremely popular. Solar heating and cooling, wind power, current kinds of bio energy, and solar photovoltaic are examples of second-generation technology. As a result of investments in research, development, and demonstration since the 1980s, they are now entering the market. Initial investment was prompted by concerns about energy security following the oil crises of the 1970s, but these technologies' long-term appeal is due, at least in part, to environmental benefits. Many of the innovations are based on important material advances.Advanced biomass gasification, biorefinery technologies, concentrating solar thermal power, hot-dry-rock geothermal power, and ocean energy are among the third-generation technologies still in development. Nanotechnology advancements may potentially have a significant influence.

## 3.SOLARHEATING

Solar heating systems are a widely known second-generation technology and generally comprise of solar thermal collectors, a fluid system to convey the heat from the collector to its place of utilization, and a reservoir or tank for heat storage. The systems can be used to heat household hot water, swimming pools, or residential and commercial buildings. The heat can also be employed in industrial processes or as a source of energy for other purposes, such as cooling equipment.

## 4.BENEFITSOFRENEWABLEENERGY

The following are some of the most significant advantages of renewable energy:

They are a renewable resource. It is one of the most significant advantages of alternative energy since renewable energy is always available for widespread usage and does not deplete like fossil fuels. The sun, wind, tides, and other natural forces will always be available for humans to use.

Municipal solid trash is being phased out. Alternative energy benefits include not only removing vast volumes of garbage now destroying the environment, but also converting this junk into a benefit through waste to energy plants. These factories treat municipal waste, converting it to electricity and removing it from the environment.

Energy production on a small scale. Producing locally has a number of advantages in terms of alternative energy. This comprises decreasing transportation costs and benefits for local economies from company putting up factories using alternative energy sources. It will no longer be necessary to import fossil fuels from other countries at exorbitant prices. There will be no need for foreign energy if there are several plants of alternative energy sources in the country.

Improved national security Alternative energy sources do not rely on foreign oil, which can be politically hostile to the United States at times. It also implies that foreign countries do not have control over the market, which is potentially volatile and unstable. Foreign dependency is completely reduced with alternative energy sources.

It is more environmentally friendly. One of the most significant advantages of alternative energy is that it is far more environmentally friendly than present fossil fuel use. Alternative energy sources do not emit carbon dioxide, and their recovery causes little or no environmental damage. Fossil fuels, such as gas and oil, emit large amounts of greenhouse gases, which contribute significantly to global warming.

A future that is healthier and cleaner. Alternative energy sources give solutions to the concerns of global warming, and they may repair some of the damage that has already been caused by the usage of fossil fuels.

All of this contributes to making our planet a healthier and cleaner place to live for future generations. If we work together, we can Price stability has improved. Alternative energy has numerous advantages, including constant availability and sustainability, as well as being significantly less expensive and stable. For each area allocated to alternative energy sources, a mix of strategies is employed to keep energy costs from changing in the way that oil and gas prices do.

Fig. 2

This helps to keep the pricing of alternative energy sources steady and prevents market instability.

**5.DISADVANTAGESOFALTERNATIVEENERGY**

Alternateenergysourceshavefollowingdisadvantages:

No Constant Supply. The energy supply is dependent on nature and, thus, is not constant, e.g.,solar energy. The same is the case with wind energy. Generating electricity through wind farms ispossible only at the countryside or other such areas where windmills can receive wind supplywithoutanyobstruction.Withhydroelectricity(orwaterenergy),thesituationfaresbetter, because once electricity is generated at the dams the electricity can be drawn with wires and canbetransported acrossmiles.

Implementing Issues. This is one of the main reasons alternative energy isn't popular. Manyorganizations decide to use alternative energy sources. However, they back out as soon as theyfindout that it'll incur huge costs.

Expensive to Use. Considering the monetary factors, fossil fuels are less costly to use thanalternative energy. Fossil fuels are readily available, can be stored at any location or transportedusing the regular means. Solar power is costly to use in daily life. Cost can be anywhere around20-25cents per KWH.

DependantonSeasons.Biomassisgenerallyproducedfromcorn,wheat,barley,andsimilarcropsallof whichare seasonal.Thusbiomass can onlybe producedonly incertain seasons. Energy/Hydropower:Hydropower(waterenergy)oftendamagesthesurroundingenvironment.Its impact on fish is well known. Many call hydropower stations as an imposition on ecosystem.Levels of oxygen dissolved in the water also decreases due to damming. It would be incorrect tosaythat disadvantages ofalternative energydon'texist

**6.NON-TECHNICAL BARRIERS TO ACCEPTANCE**

Theobstaclestothewidespreadcommercializationofrenewableenergytechnologiesareprimarilypolitical, not technical, and there have been many studies which have identified a range of non-technicalbarriersto renewable energyuse. Key barriers include:

Lack of government policy support, which includes the lack of policies and regulations supportingdeployment of renewable energy technologies and the presence of policies and regulations hinderingrenewable energy development and supporting conventional energy development. Examples includesubsidiesforfossil-fuels,insufficientconsumer-basedrenewableenergyincentives,governmentunderwriting for nuclear plant accidents, and complex zoning and permitting processes for renewableenergy.

Lackofinformationdisseminationandconsumerawareness.Highercapitalcostofrenewableenergytechnologiescomparedwithconventionalenergytechnologies. Inadequatefinancingoptionsforrenewableenergyprojects,includinginsufficientaccesstoaffordablefinancing for projectdevelopers, entrepreneurs andconsumers. Imperfect capital markets, which includes failure to internalize all costs of conventional energy (e.g.,effects of air pollution, risk of supply disruption) and failure to internalize all benefits of renewableenergy(e.g.,cleaner air, energysecurity).

Inadequate workforce skills and training, which includes lack of adequate scientific, technical, andmanufacturingskillsrequiredforrenewableenergyproduction;lackofreliableinstallation,maintenance, and inspection services; and failure of the educational system to provide adequatetraininginnew technologies.Lackofadequatecodes,standards,utilityinterconnectionandnet-meteringguidelines. Poorpublicperceptionofrenewableenergysystemaesthetics. Lackofstakeholder/communityparticipation-

andco-operationinenergychoicesandrenewableenergyprojects.

## 7. CONCLUSION

As the alternative energy industry grows and refines the available technology, the cost of renewable energy will decrease, and alternative power generators will become capable of supplying more power from less wind or sun, making them more reliable as a year-round power source. Over the time, as fossil fuel resources become scarcer and environmental regulations become stricter, the cost of utility supplied electricity and fuel oil will increase. It's only a matter of time before alternative power sources present themselves as the only sensible. However, it would also be wrong to imply that fossil fuel is better than alternative energy. With people growing more concerned for the environment, alternative energy is gaining popularity. And as we incorporate the advantages more in our daily life, the disadvantages of alternative energy will slowly fade away.

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