GREEN ENERGY: FUTURE SCOPE IN INDIA

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Abstract:

There are limited quantity of resources available on earth and we are using them very rapidly due to this our resources are very fastly depleting most of them are coal, oil, natural gases, nuclear energy. Now we should find the altered way to produce energy from that there is no effect on the energy production and energy security of future generations. Most important of them are solar energy, wind energy, hydro energy, geothermal energy, biomass energy these are classified in the category of non-renewable energy. These resources are pollution free and used unlimited times to produce energy and the production rate of energy in comparison of conventional energy resources is very higher and efficient. Carbon emission is a major problem of world and we can counter it only by introducing the concept of green energy. The development of a country is depend on energy production if energy security is not given by the nation to its citizens the there is lower possibilities of development but with the help of green energy we can control and regulate the energy production and its cost and also take on our nation on the way of development.

Keywords: Non-renewable energy, Green energy,

Introduction

The idea of green energy was presented in 2006 in a program of renewable energy standard offer program that is called RESOP. Another Ontario green energy act that is called green energy and green economy act,2009 is introduced to promote the production and extension of the green energy. The word 'green' is encourage us to think about the polluted free and eco-friendly environment. So the idea of green energy encourage us to introduce the natural resources in production of energy like- solar, wind, hydro, tides, biomass and geothermal energy etc. for example resources of renewable energy is comes directly from nature and we can use them for infinite times , so they are defiantly the cleaner energy source available for humanity on earth. There are many type of renewable energy resources on earth like- solar energy, wind power, hydroelectric energy, biomass energy, tide energy, geothermal energy etc. we can convert the heat received from sun into electricity and use the energy comes from wind turbines and geothermal heat, hydropower comes from the various hydro projects on different rivers. Geothermal heat comes from underneath the ground. The major benefits of renewable energy resources are that they are available in adequate volume and free of cost, zero carbon emission and eco-friendly and majorly zero dependency on other country for supply of energy. There are some rare earth minerals like lithium that are making the solar energy easy to reach to common man.

Whereas non-renewable energy resources are not eco-friendly and majorly take hazardous impacts on health. Even today most of the world produce energy from non-renewable energy resources but they are not replenished. They received from the fossils of ancient time that converted into oil and gas due to high temperature and pressure. We extracted them from mining. The most important conventional energy resources are oil, natural gases, coal, nuclear energy, and the most beneficial part of these resources are ready to use, cheaper in cost and easy to use. The major drawback of these non-renewable resources that they are in limited quantity and expire nearby future anytime, the prices are increasing continuously and these resources are responsible for climate change, global warming on a large scale. Non-renewable energy resources effecting seriously the human health and not favorable for environmental condition these resources are very harmful for human health and ecological cycle due to its carbon emission effect and global warming effect.

Installed Capacity Under Renewable Energy Resources (RES) Since 2015-2023

(In GW)

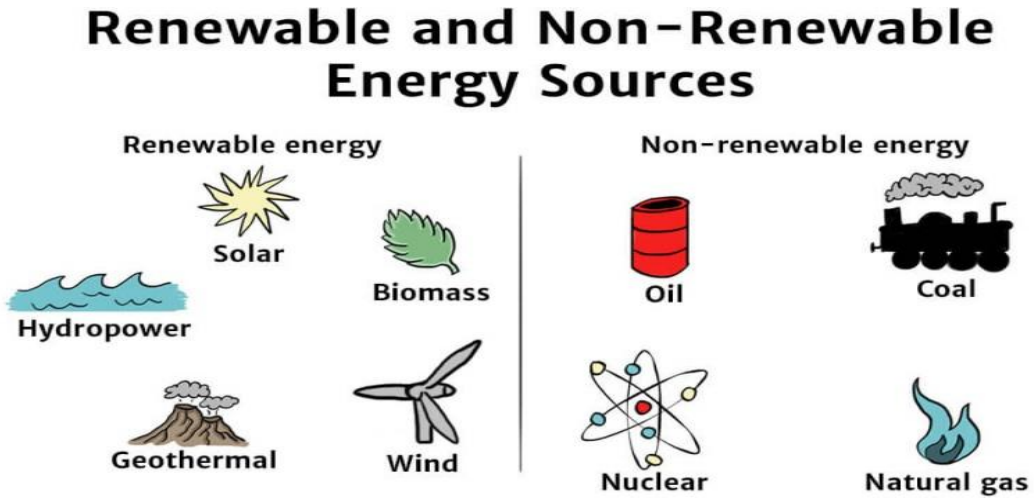
Year	Small Hydro Power	Wind Power	Bio Power	Solar Power	Total
2014-15	4.06	23.44	8.55	3.99	40.04
2022-23	4.94	42.63	10.80	66.78	125.16

Energy generation Capacity Under Renewable Energy Resources (RES) Since 2015-2023 (In BU).

Year	Small Hydro Power	Wind Power	Bio Power	Solar Power	Total
2014-15	8.06	33.77	15.29	4.60	61.72
2022-23	11.17	71.81	18.55	102.01	203.55

In year 2022 total energy generation from renewable energy reached 8439.67 Twh

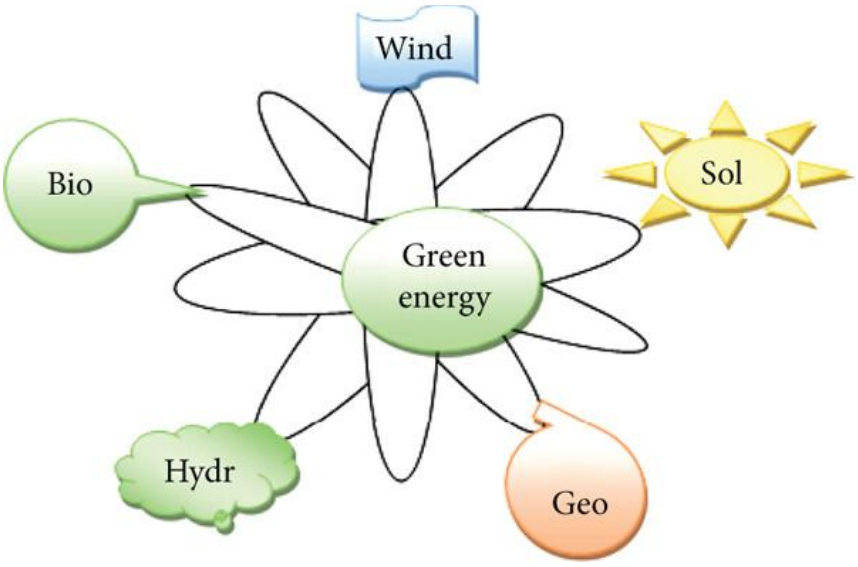
(1Twh= 1000Gwh) and with significant increase from 5039.25 Twh of 2013 with growth of 67.48% with a compound annual growth rate 5.90%.



Source - https:// solarschools.net/knowledge-bank/energy/sources

Concept Of Green Energy

Green energy comes from natural resources like-sun heat, rainfall, tides, wind power, hydropower, geothermal. These natural resources are renewable, means it comes directly from nature and used again and again. Our conventional energy resources like fossils fuel, gases are playing the important role to increasing the global warming and climate changes now that is the reason why we are adopting the concept of green energy and countering the problems of non-renewable energy resources. The primary object of developing the green energy resources is increasing the energy production and reducing the pollution and waste material from conventional energy production system. The major part of the user of green energy says that we can reduce the rate of change of climate with the help of use of green energy resources. Likely concept of green energy is focused on the issues of electricity production and co-production. These resources are helpful to reduce carbon emission, ecological hazardous and we can live a healthy and environmental friendly life. At present we can purchase the green energy bonds, renewable energy certificates. The government is promoting the use of green energy by giving the subsidy on buying electric vehicles and rooftop solar and for green energy companies. Finally green energy is source cleaner energy. India have secured 5th rank in renewable energy generation with share of 4.01% and 338.19 Twh generation capacity.



Source- https://onlinelibrary.wiley.com/cms/asset/cc8091c9-ff9a-4a85-973d-470575724e55/joen8849321-fig-0001-m.jpg

Need Of Green Energy

Green energy is produced from renewable resources of energy, it has lesser impact on our environment so to save the nature and ensure continuous energy supply we should have to use the green energy for industrial and domestic purpose also. to save ecological system and environment from global warming and carbon emission we have to promote the green energy technology. As if the temperature increases the agriculture production falls and damage increase from floods and storms, disease became more unpreventive and availability of water became a big problem. Our ecosystem will permanently damage that is irreversible. The habitants of mother earth will effect directly and indirectly. Ecosystem will disappear. Temperature rises of 3° or 4°C and more will lead to major extinctions around the world.

Types of green energy

Renewable, non-polluting energy sources is evolving at such a fast speed, it's tough to hold track of the various kinds of green energy that are now in developing stage. Here are 5 of the most common types of green energy.

Solar power

Solar thermal power means conversion of heat received from sun into electricity and it is called solar energy. Solar energy is classified into two category as passive solar energy and active solar energy. It is divided on the basis how energy collected, converted and distributed. Passive solar systems include positioning a structure to the Sunlight, taking resources with positive current area or light disappearing things, and design areas that naturally distribute appearance. Active solar technologies incorporate solar thermal energy using solar collectors for reheating, and solar power, transforming sunshine into energy whichever straight using photovoltaics (PV), or ultimately consuming concerted solar power (CSP). Commercially concentered solar panel firstly developed in 1980. There will be long

term benefits of development of green energy technologies. This indigenous green energy technology reduces the dependency on other countries, lesser pollution and increases stability and energy security of its residents. It reduces the cost to climate change. These benefits are global and to share widely with other countries.

Wind power

Another source of green energy is wind energy in which we use the flowing air to move wind turbines to produce energy. Modern wind turbine has the capacity of 600kw to 9 MW. The power capacity is the cube of wind speed so as the wind speed increase power increase its maximum capacity. Places on which high wind speed is suitable for turbines such as high altitude and offshore places like-hill area. An wind turbine consists the parts like-rotter, generator, gearbox, control system etc. The main advantage of wind energy are that the cleanest source of energy and it not contributes to produce greenhouse gases and global warming. Wind energy can be generated at lower cost and once the turbine installed and many job opportunities in remote areas. Wind energy is the important part of renewable energy to shifting towards green energy but requires balanced approach.

Hydropower

Water is 800 time dense then wind therefore slow speed stream of water and sea stream can generate considerable amount of energy. From historical point of view hydropower comes from hydroelectric power plants and reservoirs which is still popular in under developing countries. Small hydro technologies are hydroelectric power projects with the power generation capacity of 50-60 MW. The small river projects leave lesser impacts on rivers and hydropower projects.

Geothermal energy

Geothermal originates from the Greek root's geo means earth and thermos meaning heat. Geothermal energy is thermal energy stored and generated in earth and it comes from geothermal temperature and heat. Geothermal energy originates from the radioactive substance, minerals and heat. The geothermal gradient is the difference of temperature between the core and the surface of earth, the flow of geothermal heat is continuous from core to surface. The heat comes from Centre of earth (Core) to surface likely 4,000 miles.

Biomass energy

Biomass is the biological material derived from living organism. Generally, it refers the plants and stance received from plants that is called lignocellulose biomass. Biomass is directly combustion used to get the energy directly or it can be converted to different kind of biofuel. wood is the largest source of biomass energy. Its examples like- forest residual, wood chips, municipal solid waste, dead trees etc. in other words biomass include plants or living material that can be converted into fiber, bio fuel or another industrial element. Biomass can be grown from numerous types of plants like

miscanthus, corn, chinar, hemp, sorghum, sugarcane, bamboo etc. biomass can be converted into various forms of biofuel like methane, ethanol and biodiesel.

Advantages Of Green Energy

- It is a reliable, cheaper and wider resource of energy.
- It is cost effective, eco-friendly and sustainable alternative.
- This is the cleanest source of energy which not produce any type of harmful by-product.
- Green energy resources haven't negative impact on human health and environment.
- Green energy is a better energy resource for future generation's that lasts for infinite times.
- with the help of green energy, we can reduce the dependency on conventional energy resources and assure continuous energy supply.

Conclusion

Through this paper we are trying to focus on the need of green energy and eco-friendly efforts. For that we need technological advancement and development to take maximum utilization of natural resources. The world needs to reduce its dependency of energy on non-renewable energy resources. Because they are on final stage of extinction. Green energy is the alternative source of energy production from future point of view. We have to introduce the green energy appliances at our home. we need to aware the people about the green energy and reduce our dependency on it. There are many sectors that are coming forward for green energy initiative. The demand of green energy is increasing day by day and green energy will complete the demand with its advance technology but it will take some time when we produce energy and use it at home.

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