

RENEWABLE ENERGY AND ITS INDUSTRIAL APPLICATIONS

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ABSTRACT:

Renewable energy is energy that is collected from the renewable sources, the sources which are naturally available in the nature and the type of energy generated from such sources is termed as renewable energy.

The naturally available resources include sunlight, wind, rain, tides, waves, and geothermal heat.

Renewable energy is also defined as the clean energy, that directly comes from the natural sources available without the artificial sources and these sources of renewable energy can be constantly replenished.

Also, by the use of renewable energy there is no harmful effect on atmosphere and the pollution is also reduced.

The advancement in the renewable energy sources is replacing the dirty fossil fuels in the power sector, which in return gives the benefit of lower emissions of carbon and other types of pollution.

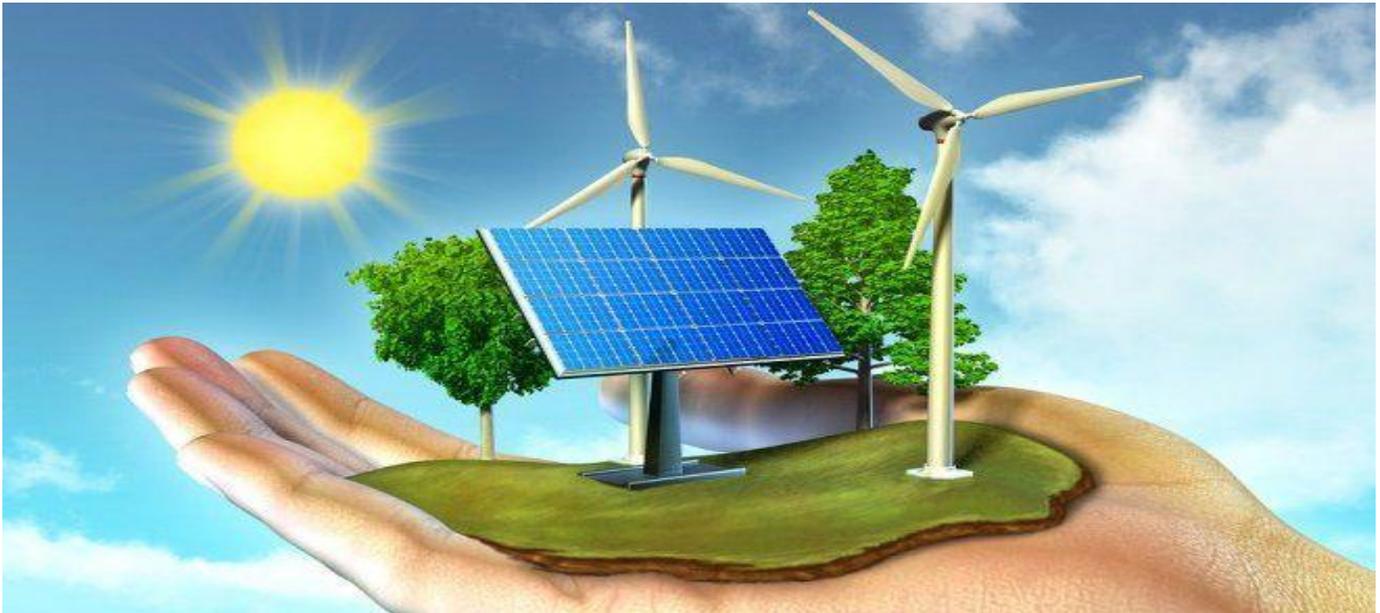


FIG-1.1 RENEWABLE ENERGY

1. INTRODUCTION:

As of late, sustainable power source has progressively pulled in broad daylight and strategy consideration especially for its capability to add to decreases in GHG emissions. Most intrigue has concentrated on the utilization of renewables in power generations as biofuels. Some consideration has been paid to the potential for renewables, especially biomass and solar thermal technologies, to add to warming and cooling in private space warming applications. Their utilization in mechanical applications has got less intrigue. This report centers around the capability of sustainable power hotspots for process heat in the modern part and for biomass feedstock replacement in mechanical procedures.

Renewable energy sources can be broadly applied in industrial applications. The four alternatives principally examined in this report are:

- Biomass for process heat.
- Biomass for petrochemical feedstocks.
- Solar thermal systems for process heat; and
- Heat pumps for process heat.

2. LITERATURE REVIEW:

Renewable energy sources are defined as the energy sources that are occurred naturally from the nature, and also the renewable energy is termed as clean energy it is because unlike the non-renewable energy it does not uses fossil fuels, coal etc. For the production of energy such type of energy pollutes the atmosphere and also causes disturbance in ozone layer. So, comparing both the forms of energies renewable energy is termed as **CLEAN ENERGY**.

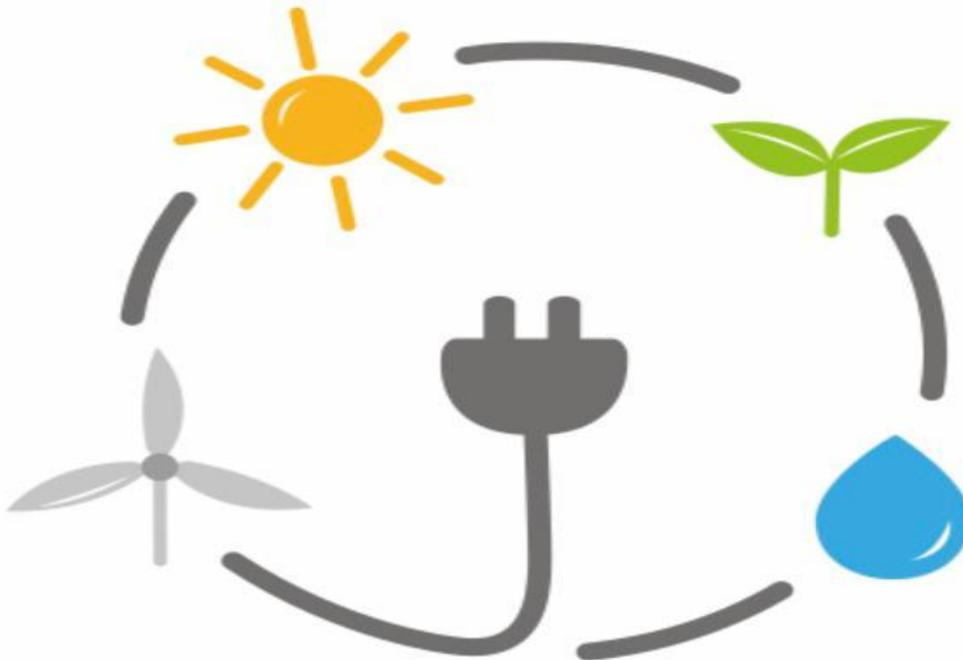


FIG-1.2 ENERGY COVERSION

The above figure is the practical example of the renewable energy and its conversion.

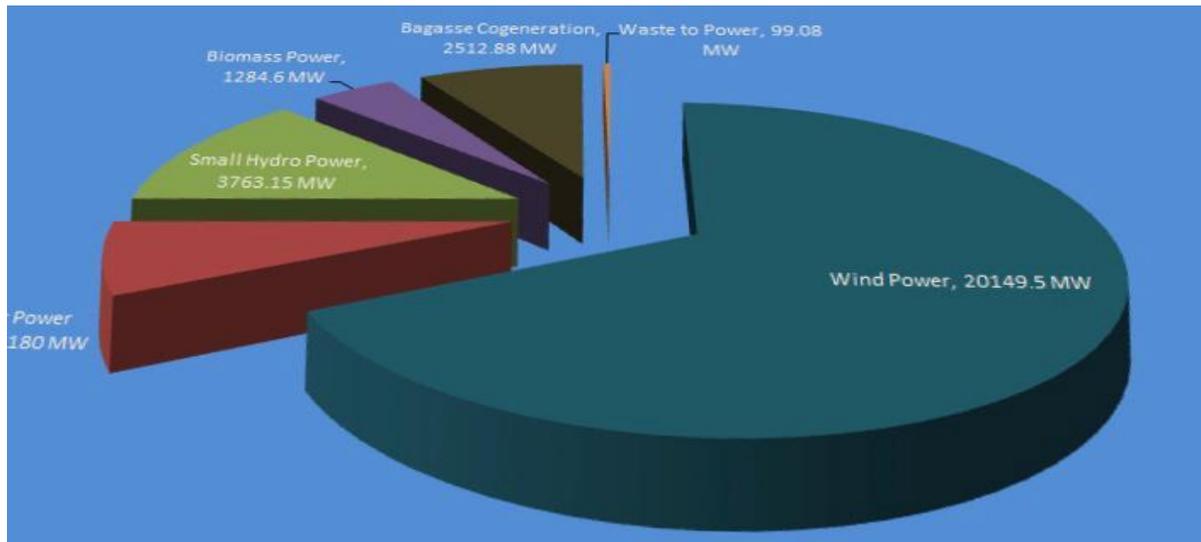


FIG-1.3 RENEWABLE ENERGY BY INSTALLED CAPACITY IN INDIA.

The above figure shows the distribution of renewable energy in India as shown in the data the largest consumption of energy goes to wind power followed up with power, small hydro power, biomass power, bagasse cogeneration, and waste to power.

Due to the advancement in the technology the world is progressing rapidly and the usage of renewable energy in all sectors is considered everywhere now a days it is because the non-renewable sources are going to end one day and depending on that one can't carry out their work in such scenario the renewable energy has set a trend where there is less pollution due to the energies used.

3. OBJECTIVES:

- The main objective of the renewable energy is to save the atmosphere from getting polluted.
- Also, to replace the use of fossil fuels which are mainly made up of hydro-carbons.
- Since it is reusable so everywhere one should make sure to use such source of energy.

4. INDUSTRIAL APPLICATIONS OF RENEWABLE ENERGY:

4.1- Biomass for process heat:

Biomass warming is a full grown, demonstrated innovation and has been utilized effectively for a long time.

Utilizing biomass is one the the main financially savvy and common-sense approaches to give space warming, boiling water and procedure warming/ steam from a low carbon source. Additionally, utilizing biomass hotspots for warming gives more financially savvy carbon investment funds than for different utilizations.

It normally offers the most elevated carbon reserve funds per unit mass of biomass, and the most noteworthy carbon investment funds that can be bought up by utilizing a unit of land to develop biomass.

4.2-Why Biomass for heat?

Biomass heating is a mature, proven technology and has been used successful for many years.

Using biomass is one of the most economical and practical ways to provide space heating. Also, the use of biomass sources for heating provides more cost-effective carbon savings than for other uses.

4.3- Feedstock used:

The most commonly used source of biomass heating fuels is virgin wood, industrial wood residues and certain agricultural residues.

5- Biomass for petrochemical feedstocks:

These feedstocks are used by the petrochemical industry to make the seven basic petrochemical building blocks: synthesis gas, ethylene, propylene, butadiene, benzene, toluene and the xylenes.

The consumption of petrochemical feedstocks all over the world is very high the highest number in consumption of petrochemical feedstocks as of the 2019 data is North America followed up with Northeast Asia, middle east. Baltic states, western Europe, southeast Asia and the rest of the world.

Carbon is an essential requirement in the petrochemical sector for the production of materials where it comprises around 75% of the total feedstock.

Olefins mainly ethylene, propylene and butadiene come under this category are produced by the steam cracking of various petrochemical feedstocks such as ethane, LPG (Liquid petroleum gas), naphtha and gas oil.

Naphtha is often considered as the main feedstock for the production of aromatics such as benzene, toluene and xylenes through reforming.

6. Solar thermal systems for process heat:

The solar systems has brought up many changes with the increase and advancement in technology where the vehicles are running on the solar panels installed on them , houses are equipped with solar panels on the roof top for the production of electricity from solar energy, using of solar energy in our day to day life also reduces the cost and its economical and pollution is also under control by the usage of solar energy.

The chemical sector has also high potential for solar thermal, but is generally on a very large scale. Cost reductions in CSP Technologies, which are united with the growth in the production of chemicals in Africa and middle east, the main barriers and the challenges faced in this sector are the scale of the area needed for solar collectors.

7. Heat pumps for process heat:

Heat pumps can take the heat from the environment or from waste heat streams and supply it to the industrial applications without the need of burning any type of fuel.

Using of heat pumps reduces the pollution and the cost of fuel is also neglected here. In applications where the pumping energy is in the form of electricity produced from the renewable energy sources by using of its many resources available, heat pumps are a fully renewable energy technology. where the power is obtained from fossil fuels only part of the energy output can be regarded as renewable.

8. Results and Discussions:

Electrical energy is generally produced by the two forms of available sources that is renewable energy sources and non-renewable energy sources the work carried out using the non – renewable energy sources are no usable once after the first use like burning of the petrol is not returned after its use same is with coal and other non-renewable energy sources .

Renewable energy sources are the energy sources that are naturally available in the nature and also that can be reusable after its use so that there is no scarcity of the available resources in the nature.

There are many resources of the renewable energy from where the energy can be produced again and again through some process unlike the non-renewable energy sources one can't be dependent on non-renewable energy sources since they may end up one day if they are been used in large quantities.

So, it is advisable that the use of renewable energy sources should be implemented in coming future in every stream of science and technology because that reduces the pollution and also the cost is very economical.

9. Conclusions:

In the event that social orders far and wide presume that the solaces and ways of life related with petrochemical products speak to a need in an asset obliged world, it is conceivable to tie down access to adequate biomass asset to help a huge scope petrochemical-style industry given the size of its feedstock request comparative with energy and transport. There are clear tradeoffs against mobility, diet and visual amenity for example, versatility, diet and visual convenience. The structure hinders for the important advances have been extensively evolved over ongoing decades however have seen just restricted arrangement in a synthetic concoction's creation setting to-date. The exact way wherein they should be gathered and further refined relies upon cultural decisions with respect to which items society 'must' have and the end uses to which constrained feedstocks can truly be put. Given the long lead time engaged with growing enormous scope framework for shipping syngas and for overseeing biomass logistics, the time has come to begin establishing the frameworks.

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