

Wellsprings and non-conventional source of energy

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Abstract: *Energy is the most important requirement for economic development and social transformation for all the countries in the world. India is currently facing energy crisis with its major dependency on coal, crude oil imports to meet sharply growing energy needs of the country. Moving towards renewable sources of energy will reduce the crises. Renewable energy sources are energy sources that are always being replenished. They can never be depleted. Some examples of renewable energy sources are solar energy, wind energy, hydropower, geothermal energy, and biomass energy.*

I. INTRODUCTION:

Renewable energy sources are energy sources that are always being replenished. They can never be depleted. Some examples of renewable energy sources are solar energy, wind energy, hydropower, geothermal energy, and biomass energy.

The five major **renewable energy** resources are **solar**, wind, water (hydro), **biomass**, and geothermal. Since the dawn of humanity people have used renewable sources of energy to survive -- wood for cooking and heating, wind and water for milling grain, and **solar** for lighting fires

Advantages of renewable energy

- Renewable energy won't run out.
- Maintenance requirements are lower.
- Renewables save money.
- Renewable energy has numerous health and environmental benefits.
- Renewables lower reliance on foreign energy sources.
- Higher upfront cost.
- Intermittency.
- Storage capabilities.

Renewable energy resources

- Biomass.
- Biogas
- Tidal Energy.
- Wind Energy.
- Geothermal Energy
- Radiant Energy.
- Hydro Electricity
- Compressed Natural Gas.
- Solar Energy
- Nuclear energy



Fig.1: Resources of renewable energy

Renewable energy world scenario

Several countries are pioneers in renewable energy.

Iceland is currently the only country in the world that obtains 100% of its energy from renewable resources, with 87% of its from hydro-power and 13% from geothermal power. Costa Rica is among the top renewable energy users, with 99% of its electricity needs coming from hydroelectric, geothermal, and wind. Norway is around 98% renewable and uses hydroelectric, geothermal and wind, to achieve its goal.

Renewable resources include solar energy, wind, falling water, the heat of the earth (geothermal), plant materials (biomass), waves, ocean currents, temperature differences in the oceans and the energy of the tides. Renewable energy technologies produce power, heat or mechanical energy by converting those resources either to electricity or to motive power. The policy maker concerned with development of the national grid system will focus on those resources that have established themselves commercially and are cost effective for on-grid applications. Such commercial technologies include hydroelectric power, solar energy, fuels derived from biomass, wind energy and geothermal energy. Wave, ocean current, ocean thermal and other technologies that are in the research or early commercial stage, as well as non-electric renewable energy technologies, such as solar water heaters and geothermal heat pumps, are also based on renewable resources

Indian scenario about Renewable energy

According to 2027 blueprint, India aims to have 275 GW from renewable energy, 72 GW of hydroelectricity, 15 GW of nuclear energy and nearly 100 GW from “other zero emission” sources. In the quarter ending September 2019, India's total renewable electricity capacity (including large hydro) was 130.68 GW. Renewable energy in India comes under the purview of the Ministry of New and Renewable Energy (MNRE). Newer renewable electricity sources are targeted to grow massively by 2022, including a more than doubling of India's large wind power capacity and an almost 15 fold increase in solar power from April 2016 levels.

India came down two spots in a year and is now ranked fourth in the renewable energy country attractive index, trailing China, the US and Germany. The country's renewable energy capacity stands at 69,685 MW at the end of FY18. India is well-endowed with both exhaustible and renewable energy resources. Coal, oil, and natural gas are the three primary commercial energy sources. India's energy policy, till the end of the 1980s, was mainly based on availability of indigenous resources. Coal was by far the largest source of energy.

The Renewable Electricity Futures Study found that an 80 percent renewables future is feasible with currently available technologies, including wind turbines, solar photovoltaics, concentrating solar power, bio-power, geothermal, and hydropower. A 100 percent renewable energy future is necessary not only for the climate, but also for local communities. Moving away from the current fossil fuel economy can make our communities healthier, reduce pollution, and create more and better jobs.

India has a strong manufacturing base in wind power with 20 manufactures of 53 different wind turbine models of international quality up to 3 MW in size with exports to Europe, the United States and other countries. Wind or Solar PV paired with four-hour battery storage systems is already cost-competitive, without subsidy, as a source of dispatchable generation compared with new coal and new gas plants in India.

Renewable resources are environmentally benign.

Renewable energy facilities generally have a very modest impact on their surrounding environment. The discharges of unwanted or unhealthy substances into the air, ground or water commonly associated with other forms of generation can be reduced significantly by deploying renewables. Clean technologies can also produce significant indirect economic benefits. For example, unlike fossil-fuel facilities, renewable facilities will not need to be fitted with scrubbing technology to mitigate air pollution, nor will a country need to expend resources in cleaning up polluted rivers or the earth around sites contaminated with fossil-fuel by-products. Furthermore, they provide greenhouse gas reduction benefits and should a worldwide market for air emission credits emerge as has been predicted, countries with a strong portfolio of renewable energy projects may be able to earn pollution credits which can be exchanged for hard currency. Finally, having a clean environmental profile enhances the attractiveness of renewable projects in the eyes of investors, especially the multilateral development agencies, many of whom operate under guidelines that require the promotion of non-polluting technologies.

II. CONCLUSION

Renewable energy facilities enhance the value of the overall resource base of a country by using the country's indigenous resources for electricity generation. Moreover, since these facilities operate on "fuels" that are both indigenous and renewable (as distinguished from imported fossil fuels), they may reduce balance-of-payment problems. Reduced dependence on fuel imports reduces exposure to currency fluctuations and fuel price volatility. The construction and operation of renewable projects normally generate significant local economic activity,

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