Paper Presented on

Renewable Energy Sources – Policies of India

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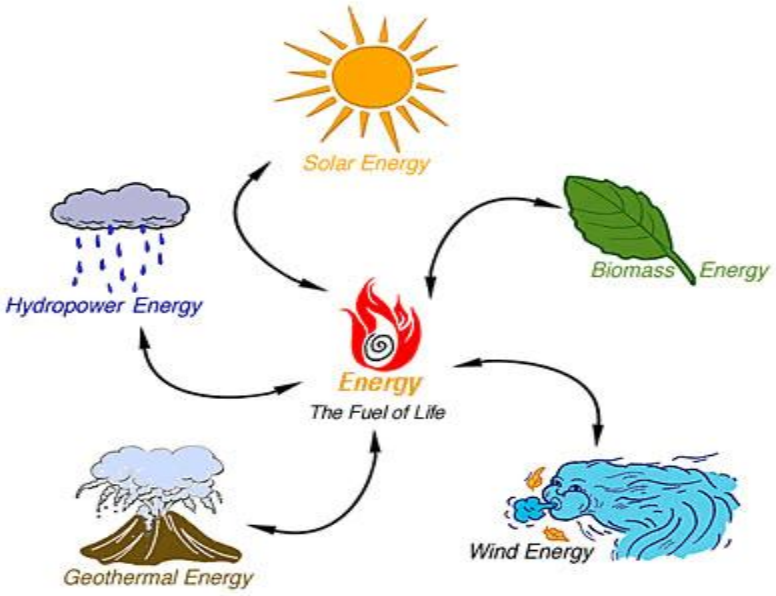


*Renewable Energy Sources – **Policies of India***

Abstract:-

In today's date, India is a large consumer of fossil fuel such as coal, crude oil etc. The rapid increase in use of Non renewable energies such as fossil fuel, oil, natural gas has created problems of demand & supply. Because of which, the future of Non renewable energies is becoming uncertain. Also India has had a negative Energy Balance for decades, which has resulted in the need to purchase energy from outside the country to fulfill the needs of the entire country. Even though, The Ministry of Power has set an agenda of providing Power to All by 2012. This makes everyone to think, how this will be going to happen? The answer found is presented in this paper called "*Renewable Energy Sources – **Policies of India**"*

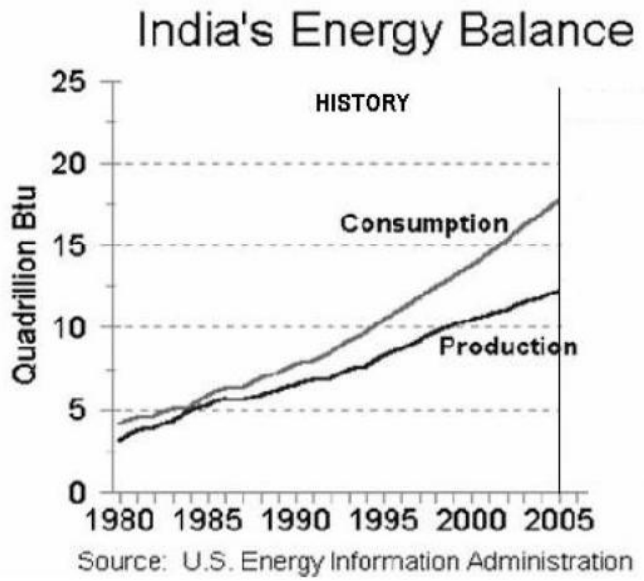
India has a large amount of, supply of renewable energy resources & hence India has decided to organize a program for proper utilization of renewable energy resources. As a result of which, India is the only country in the world to have an exclusive ministry for renewable energy development, The Ministry of Non-Conventional Energy Sources (MNES).

The analysis of need of renewable energy sources, the policies of India through MNES, Legal aspect of Government of India about renewable energy sources, sources of renewable energy available in India, Estimates of potential capacities of India from renewable energy sources is presented in this paper.

Current Scenario of Conventional Energy Sources in India.

At present India is a large consumer of fossil fuel such as coal, crude oil etc. Over a past few decades, energy is needed for everything. The electricity requirement is increasing at an alarming rate due to increased population & industrial growth. This rapid increase in use of energy has created problems of demand & supply. Because of which, the future of Non renewable energies is becoming uncertain.

India ranks sixth in the world in total energy consumption. Coming to power generation in the country, India has increased installed power capacity from 1362MW to over 112,058MWsince independence & electrified more than 50,000 villages. This achievement is impressive but not sufficient .It is matter of concern that 44% of households do not have access to the electricity & as many as 80,000 villages are yet to be electrified. It indicates that India has had a negative Energy Balance for decades.



As per 16th electric power survey, the anticipated demands require an additional 1, 00,000MW supply. In other words, the achievements of more than 5 decades need to be reproduced in the next decade. The task is overwhelming but not unachievable, because India has significant potential for generation of power from renewable energy sources.

As India has a large amount of, supply of renewable energy resources, India has decided to organize a program for proper utilization of renewable energy resources. As a result of which, ***India is the only country in the world to have an exclusive ministry for renewable energy development, The Ministry of Non-Conventional Energy Sources (MNES).***

- **Policies of India for renewable energy sources.**

Today, India has significant potential for generation of power from renewable energy sources. India's search for renewable energy resources that would ensure sustainable development and energy security began in early 70's of the last century. Consequently, use of various renewable energy resources and efficient use of energy were identified as the two thrust areas of the sustainable development.

The few important steps taken by the Ministry of India for development of renewable Energy sources are recapitulated below:

- India has among the world's largest programs for renewable energy. India's activities cover all major renewable energy sources of interest to us, such as, biogas, biomass, solar energy, wind energy, small hydro power and the other emerging technologies. In each of these areas, India has programs of resource assessment, R&D, technology development and demonstration. Several renewable energy systems and products are now not only commercially available, but are also economically viable in comparison to fossil fuels, particularly when the environmental costs of fossil fuels are taken into account.
- Realizing the need for concentrated efforts in this sector, The Government of India established a Commission for Additional Sources of Energy (CASE) in the Department of Science and Technology, in 1981. The mandate of CASE is to promote research and

development activities in the field of renewable energy.

- CASE was formally incorporated in 1982, in the newly created Department of Non-conventional Energy Sources (DNES). In 1992 DNES became the Ministry for Non-conventional Energy Sources, commonly known as MNES.
- India has a vast supply of renewable energy resources, and it has one of the largest programs in the world for deploying renewable energy products and systems. Indeed, it is the only country in the world to have an exclusive ministry for renewable energy development, the Ministry of Non-Conventional Energy Sources (MNES). MNES was renamed the Ministry of New and Renewable Energy.
- India has pioneered in the world in many administrative actions of renewable energy promotion such as:-

1) Electricity regulatory commission within liberalized market-1991

2) Mandatory environmental audits for power projects -1992

3) Energy conservation bill -2000

4) Renewable Energy promotion bill- 2005.

- The Ministry is encouraging the setting up of grid-interactive power projects based on renewable energy through private investment route.
- The State Nodal Agencies are responsible for promotion and development of private sector projects by way of providing necessary clearances, allotment of land, allotment of potential sites in case of SHP projects and facilitating power purchase agreements etc.
- State Electricity Regulatory Commissions (SERCs) are determining tariffs by taking into account the submissions of all stakeholders, including consumers.
- A number of leading financial institutions and banks are financing renewable energy based power
- **Legal Provisions**:- **Under the Electricity Act, 2003**, the Central Government, from time to time, is responsible for preparing the national electricity policy and tariff policy, in consultation, among others, with the State Governments for the optimal utilization of all resources, including renewable sources of energy.

The Act 2003 has several enabling provisions, with a view to promote accelerated development of non-conventional energy based power generation, as summarized below:

Section 86(1) (e), "The State Commission shall promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution license"

Section 3 (1), Government of India (GoI) shall, from time to time, prepare the National Electricity Policy and Tariff Policy, in consultation with the State Governments for developing the power system based on optimal utilization of resources such as coal, natural gas, nuclear, hydro, and renewable sources of energy.

Section 4, GoI shall, after consultation with the State Governments, prepare a national policy, permitting stand-alone systems (including those based on renewable sources of energy) for rural areas.

For these reasons, today India is among the leaders in the world in utilization of several renewable Energy Technologies.

➢ The range of activities of Ministry covers

- Promotion of renewable energy technologies
- Renewable energy resource assessment
- Production of biogas units, solar thermal devices, solar photovoltaic, cooks stoves, wind energy and small hydropower units.
- Strengthen India's energy security
- Find A viable solution for rural electrification
- Administered pricing mechanism
- Optimum utilization of existing assets
- Adoption of energy efficient technologies in giant industries
- Decrease dependence on energy imports
- Administered pricing mechanism
- Optimum utilization of existing assets
- Formulation of policy and legislation
- Institutional Linkages for integration of renewable energy
- Identification of high focus areas
- Marketing outlets
- R&D and specialized institutions
- International partnerships and exports
- Concern for the environment
- Take efforts to minimize the demand-supply gap, especially as population increases.

➢ Sources of renewable energy available in India-Potential of India

- **Hydro Power**

Courtesy of The National Renewable Energy Laboratory (NREL)

The hydroelectric power refers to the energy produced from water (rainfall flowing into rivers, etc).The force of flowing & falling water is used to run water turbines to generate energy. The dominant annual rainfall is located on the

North/eastern part of India: Arunachal Pradesh, Assam, Nagaland, Manipur and Mizoram and also on the west coast between Mumbai

India utilizes twelve primary hydroelectric power plants: Bihar (3), Punjab, Uttaranchal, Karnataka, Uttar Pradesh, Sikkim, Jammu & Kashmir, Gujarat, and Andhra Pradesh (2). ***The estimated potential of small hydro power n India is about 15000 MW.***

- **Wind Energy**

It is one of the most environment friendly, clean and safe energy resources. The ten machines near Okha in the province of Gujarat were some of the first wind turbines installed in India. India has the 5th largest wind power installed capacity of 3595 MW in the world. ***The estimated potential of wind energy in India is about 45,000 MW.***

- **Solar Energy**

India has huge solar potential. The sunniest parts are situated in the south/east coast, from Calcutta to Madras. Solar energy can be used in two ways- Solar heating & Solar electricity. A solar power plant offers good option for electrification in areas of disadvantageous locations such as hilly regions, forests, deserts & islands where other resources are neither available nor exploitable in techno economically viable manner. Most parts of the country have about 250 to 300 sunny days. Thus there is tremendous solar potential.

140MW solar thermal hybrid power plants with 35 MW solar through component will be constructed in Rajasthan raising India into the second position in the world in utilization of solar thermal. Grid interactive solar photovoltaic power projects aggregating 2440KW have so far been installed. ***The estimated potential of solar power in India is about 20,000 MW.***

- **Biomass energy**

India is very rich in biomass. In the area of small scale biomass gasification, significant technology development work has made India a world leader. A 500 KW grid interactive biomass gasifier linked to an energy plantation

has been commissioned under a demonstration projects. The estimated potential of Biomass ***energy in India is about 19,500 MW.***

Following is a list of some States with most potential for biomass production:

Andhra Pradesh (200 MW), Bihar (200 MW), Gujarat (200 MW), Karnataka (300 MW), Maharashtra (1,000 MW), Punjab (150 MW), Tamil Nadu (350 MW), Uttar Pradesh (1,000MW).

As India has such a massive potential of Renewable Energy Sources, It is possible to provide Power to All.

➢ Conclusion

Over the past few decades energy is the backbone of technology & economic development. Rapid increase in use of energy has created problems of demand & supply. According to current situation , 80,000 villages are yet to be electrified. Also India has had a negative Energy Balance for decades. Even though, The Ministry of Power has set an agenda of providing Power to All. Could India meet all energy needs, was the problem statement of this paper.

The answer found is Yes, ***India can meet all energy needs with Renewable Energy Sources.***

Solution to long-term energy problems will come only through research, development & implementation of such developments & recherché in the field of renewable energy sources. The total estimated potential of renewable Energy is around 152,000 MW, which is much greater than the current total installed energy generating capacity of India. To overcome energy crises, Government has developed many projects & programs for proper utilization of renewable energy resources.

Energy problem is global problem. Only the government cannot do everything. However individual & co-operative efforts can do a lot. So let us all work together to execute the agenda of providing Power to All by 2012.

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