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Renewale Energy: Future Scope

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Abstract: India has the fifth largest power generation portfolio in the world and fourth largest installed capacity of wind power. Despite of this capacity 24X7 power supply still remains a dream. Because demand is running ahead of the supply. Therefore, engineers are think alternative sources of energy which did not make impact on environment.
Renewable energy play a critical role of reducing global carbon emissions and the craze of investment has greatly increased as the cost of technologies fall and efficiency continues to rise. In fact, global investment in renewable energy increased for the first time in three years to $270bn, a 17 per cent rise from 2013, the UN Environment Program reported in March 2015. However, the benefits of renewable energy go beyond reducing carbon emissions; here are just three reasons why renewable energy are rapidly making their way up the energy agenda.
This paper elucidates about Different Energy sources, why we are going for non-conventional energy sources, Different non-conventional energy sources & comparison between them, about fuel cells and their applications.
Keywords: Renewable, Photovoltaic, MHD, Environment Impact.

I. INTRODUCTION

Renewable energy technologies are clean sources of energy that have a much lower environmental impact than conventional energy technologies. Today, whole world is suffering from global warming and ozone layer depletion . Major cause for above problems are conventional energy sources. Renewable energy will not run out. Ever. Other sources of energy are finite and will someday be depleted. Most renewable energy investments are spent on materials and workmanship to build and maintain the facilities, rather than on costly energy imports.
The main reasons for shifting power generation from conventional method to renewable technique are following:

A. Increasing price competitiveness

Diesel, Gas, fossil fuels and other conventional energy alternatives- each with their unique advantages- collectively pose a threat to power plant operators and end users: volatility and insecurity of price. The price of gas fluctuates across regions and, for fossil fuels, in a cyclical pattern.
On the contrary , Renewable energy prices have been continually decreasing, with the most significant price drop being observed in solar – 80% over the last seven years. We have also seen prices for onshore wind drop by 25%, while offshore wind starts to show the sign of decreased price as well.
We have simultaneously witnessed tremendous advancement on the whole value chain: more energy efficient equipment, better engineering work and device design, and most notably the technology leap enabled by innovation. In addition, the maturity of the market can drive down the price of renewable energy rapidly – trained and skilled workers are available locally; a matured banking system helps secure funding with advanced risk management; permission and connection are streamlined where policy makers want to contribute; and the increased proximity of projects could save travel cost for experts flying from one site to another.

B. Long-term certainty

Renewable energy have been encouraged by policy measures and financial support, with the explicit aim of driving costs down through early deployment. But the necessity for this is disappearing as we speak for solar and wind (and it has been for hydro for a while now), bringing to the fore solid competitors to fossil fuels or nuclear power, especially when long-term price evolutions are part of the deals.
The average wind or solar farm is built for up to 25 to 30 years of operation, or even longer for hydro power plants. The operator is aware that the equipment will be refurbished and expects that the newly upgraded solar module or wind turbine will be considerably more efficient at a lower cost. Therefore renewable energy shall continue to generate electricity for a very long time while their efficiency continues to increase, further boosting competitiveness.

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Current low oil prices only marginally affect renewable energy, or indirectly through gas prices. And like all things, low oil prices must one day come to an end. Today, oil prices have hit almost $70 per barrel and some analysts believe that the global benchmark Brent crude will rise by $15 or more a barrel by year-end. If current trends persist, it remains very likely that renewable energy that are now in use will serve us long after the higher oil price . And no doubt, renewable energy are an infinite source of power- the ultimate definition of long-term certainty.

C. Energy Security

The majority of oil & gas sources are concentrated in certain regions, many of which are getting more technically challenging and more expensive to reach, whereas renewable energy is domestic.

It provides security of supply, helping a nation reduce its dependence on imported sources. It plays a significant role in addressing our energy needs by replacing foreign energy imports with clean and reliable home-grown electricity with the added bonus of fantastic local economic opportunities.

To have great diversity in a nation's energy supply is yet another way to strengthen energy security. A diversified category of energy assets contributes to a long-term, sustainable energy strategy that protects the power supply from market fluctuations and volatility. They say 'never put all your eggs in one basket' – and with energy it is no different; it is a wise move to maintain a share of renewable energy in the nation's energy mix.

Today, hydro, wind and solar are the three main pillars for renewable energy. Tidal energy is still in development. In the same way that technology brought renewable energy into the center of the global energy mix to begin with, it is now offering great prospects for unlocking the untapped energy that remains for infinite time.

1) *Solar Energy:* Major parts of renewable energy comes either directly or indirectly from the sun. Sunlight, solar energy, can be used directly for heating and lighting homes and other buildings, for generating electricity, and for hot water heating, solar cooling, and a variety of commercial and industrial uses. The sun's heat also drives the wind hose energy is captured with wind turbines. Then, the winds and the sun's heat cause water to evaporate. When this water vapor turns into rain or snow and flows downhill into rivers or streams, its energy can be captured using hydroelectric power. Renewable energy investments are usually spent within the state, and often in the same town.

   This means your energy rupees stay home to create jobs and fuel local economies, rather than going overseas to purchase the same energy. Meanwhile, renewable energy technologies developed and built in the countries are being sold overseas, providing a boost to that countries' trade deficit. After the oil supply disruptions of the early 1970s, our nation has increased its dependence on foreign oil supplies instead of decreasing it. This increased dependence impacts more than just our national energy policy.

   The electricity requirements of the world including India are increasing at alarming rate and the power demand has been running ahead of supply. It is also now widely recognized that the fossil fuels (i.e., coal, petroleum and natural gas) and other conventional resources, presently being used for generation of electrical energy, may not be either sufficient or suitable to keep pace with ever increasing demand of the electrical energy of the world. Also generation of electrical power by cold based steam power plant or nuclear power plants causes pollution, which is likely to be more acute in future due to large generating capacity on one side and greater awareness of the people in this respect.

   The recent severe energy crisis has forced the world to develop new and alternative methods of power generation, which could not be adopted so far due to various reasons. The magneto-hydro-dynamic (MHD) power generation is one of the examples of a new unique method of power generation. The other non-conventional methods of power generation may be such as solar cells, wind power generation, fuel cells, thermo-electric generator, thermionic converter, geo-thermal energy generation, tidal power generation etc.

2) *Present Condition of India:* India has the fifth largest power generation portfolio in the world and its current renewable energy contribution stands at 44.812 GW which includes 27.441 GW of Wind power and 8.062 GW of Solar power installed capacity in the country. (As on 31.07.2016). Fourth largest installed capacity of wind power. Third largest installed capacity of concentrated solar power (CSP) .Renewable energy contributes 14.7% of the total installed capacity in the country as on 31.07.2016. Ambitious target of 175 GW of renewable power by 2022 which will include 100 GW of Solar power, 60 GW from wind power, 10 GW from biomass power and 5 GW from small hydro power.

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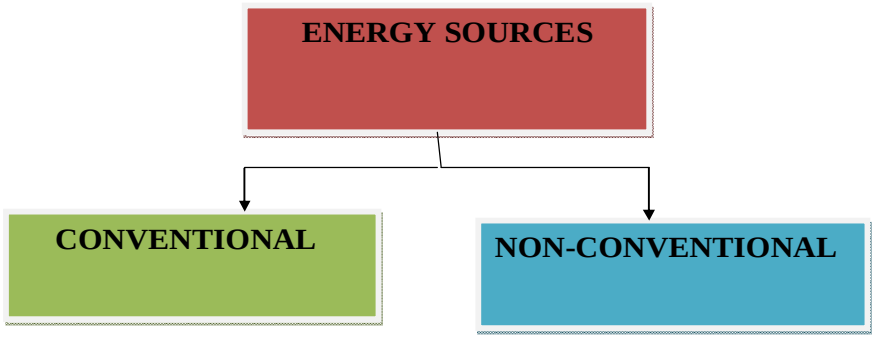

Figure 1. Type of Energy sources

Basically the energy sources are two types; they are conventional energy sources like coal, petroleum, natural gas etc. & non-conventional energy sources like solar cells, fuel cells, thermo-electric generator, thermionic converter, solar power generation, wind power generation, geo-thermal energy generation, tidal power generation etc.

3) *Present Scenario of Efficiency of Different Energy Generation Method:* Fast depletion of conventional energy sources made us to look after alternate energy sources such as magneto-hydro-dynamic (MHD) power generation and other non-conventional methods of power generation.

Different Non-conventional methods of power generation & their efficiencies:

S.NO	METHOD	EFFICIENCY	
		PRESENT	FUTURE
1.	MHD Power generation	Around 50%	Up to 60%
2.	Thermo-electric power generation	Around 3%	Up to 13%
3.	Thermionic converters	Around 15%	Up to 40%
4.	Photo-voltaic or solar cells	Around 15%	___
5.	Fuel cell technologies	**Around 50%**	**Up to 60%**
6.	Solar power generation	Around 30%	Up to 50%
7.	Wind power generation	Around 30%	___
8.	Geo-thermal power generation	Around 15%	___

From the above table fuel cell technologies having higher efficiency compared with other methods of electric power generation. Another reason for the interest in fuel cells is; cost per kW of power is independent of size (or rating) of the fuel cells. The other merits are as follows.

II. CONCLUSION

In present time, whole world is suffering from global warming, dense fog due to pollution, acute disease like cancer due to ozone depletion pollution. Root cause of all the above problem is burning of fossil fuel(coal, diesel, petrol). To save the environment for our upcoming generation, we have to follow the renewable energy sources like solar, wind, geo-thermal and tidal.

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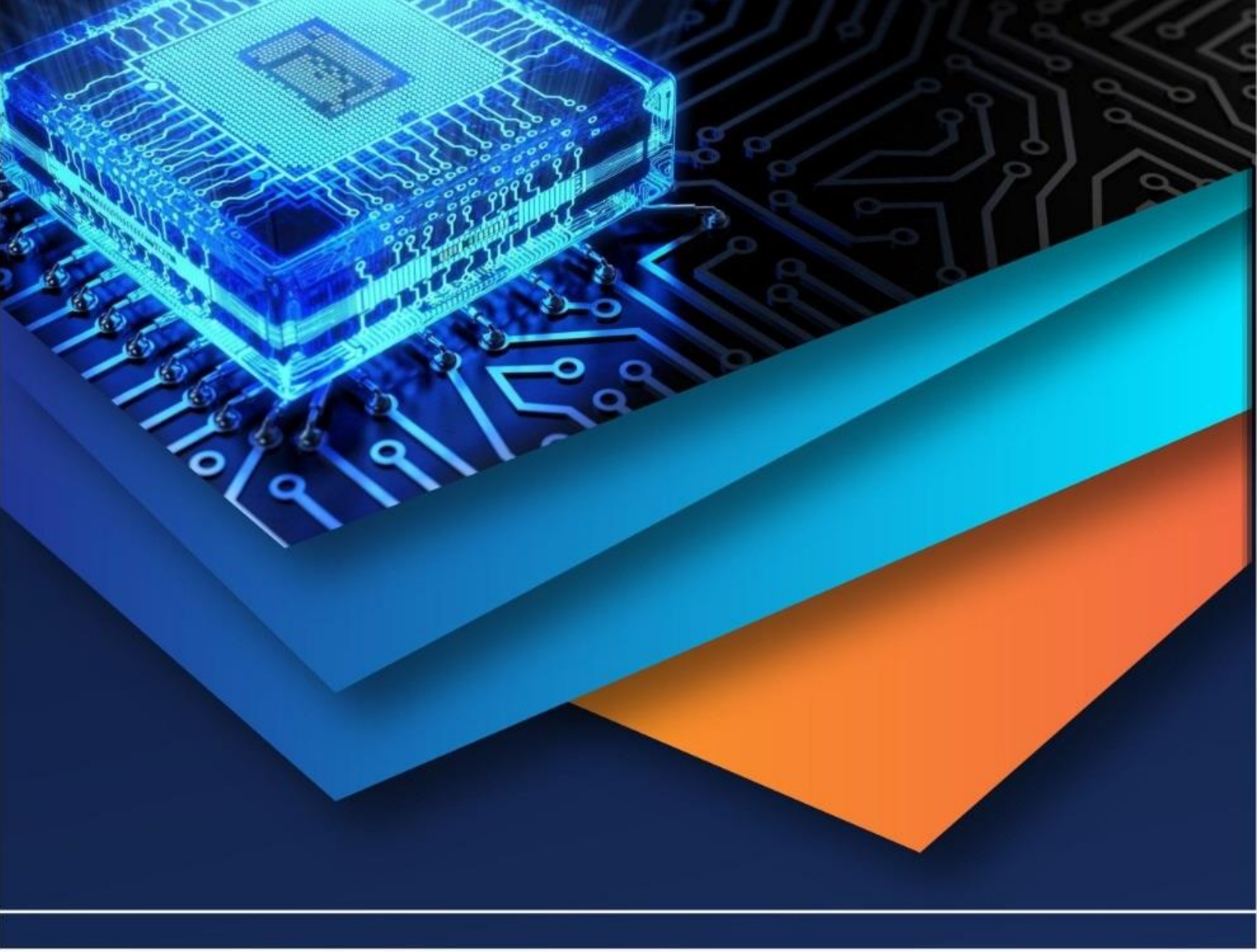

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