

A Comparative Power Generation Scenario of Renewable Energy and Anticipated Power Requirement of India

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ABSTRACT

In India the power generation through conventional and non-conventional method is very high but still it suffers lack of generation In the last few decades, India's energy use has increased 16 times and the installed electricity capacity by 84 times though demand is not fulfilled by this generation. This paper gives an overview of generation and demand difference in India and installed capacity of renewable energy.

Key words: - Renewable power generation analysis.

I. INTRODUCTION

The power generation in India is rapidly increasing as the growth of the country[1] India's electricity generation has been increasing continuously to meet the needs of the rapidly growing economic activity of the country [3]. Indian power sector is facing challenges and despite significant growth in generation over the years, it has been suffering from shortages and supply constraints [4]. In recent years, from an environmental point of view, the renewable energy resources are being looked at as unlimited, inexhaustible, environment friendly and sustainable sources. Direct and indirect. of the electricity generation by renewable sources[5].

II. RENEWABLE ENERGY

In renewable power generation India stand on 5th position in global ranking. Renewable energy uses energy sources that are continually replenished by nature—the sun, the wind, water, the Earth's heat, and plants.

Renewable energy technologies turn these fuels into usable forms of energy most often electricity. As per records and reviews in India still most of the percents power are generating by the conventional sources and we are very much depending on conventional power generation methods and still we need to improve and depend in renewable energy sources.

III. INSTALLED CAPACITY OF RENEWABLE ENERGY

India is rich country in renewable energy sources. Indian government has taken a great step ahead for electricity generation through renewable energy sources i.e. solar energy, small hydro power, wind energy, biomass energy, ocean and tidal energy etc. there are some states which highly depends their power generation through renewable energy sources. The bellow graph shows total power generation through renewable energy till end of year 2014:

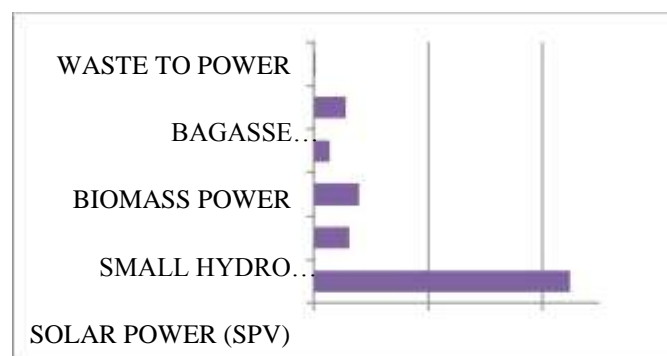


Fig.1 total generated capacity of renewable energy year 2014
(Source via cea annual report 2014)

IV. SOLAR POWER

Solar energy is a time dependent and intermittent energy resource. Solar energy is the ultimate energy source driving the earth. Though only one billionth of the energy that leaves the sun actually reaches the earth's surface, this is more than enough to meet the world's energy requirements. Total power generated in year 2014 is shown in the bellow graph:

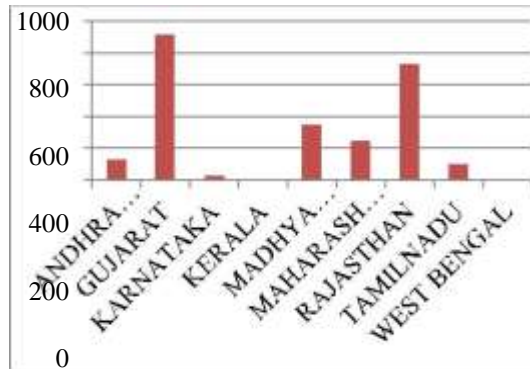


Fig.2 Total solar generated power in 2014
Source cea annual report 2014

From the graph its seen that Gujarat is the one of highest generating state in solar energy generation and Kerala is the lowest power generating state.

V. SMALL HYDRO POWER

Hydroelectric power is generated by using the energy of flowing water to power generating turbines for producing electricity. Most hydroelectric power is generated by dams across large-flow rivers. A dam built across river creates a reservoir behind it. The height of the water behind the dam is greater than that below the dam, representing stored potential energy. The generated capacity of small hydro power till end of 2014 is shown in bellow graph:

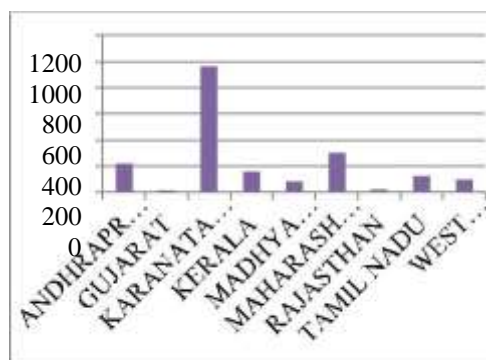


Fig.3 Total small hydro generated power in 2014
(Source cea annual report 2014)

VI. WIND POWER

Wind is the result of the sun's uneven heating of the atmosphere. Warm air expands and rises, and cools air contracts and sinks. This movement of the air is called wind. Wind has been used as an energy source for millennia. It has been used to pump water, to power ships, and to mill grains. Areas with constant and strong winds can be used by wind turbines to generate electricity. The total power generation through wind mill till end of year 2014 is given by bellow graph:

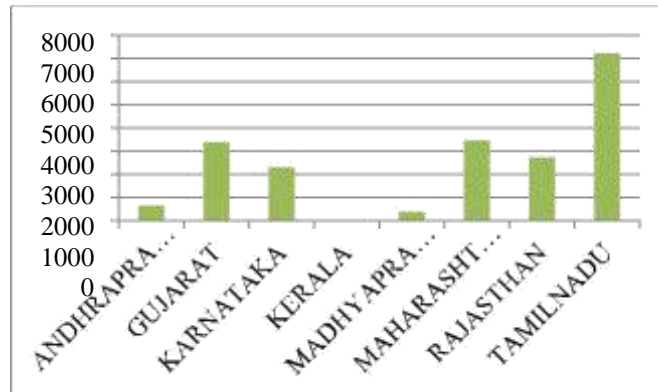


Fig. 4 Total generated wind power in end of year 2014 Indian renewable energy status report 2014

VII. BIOMASS ENERGY

Biomass energy is the oldest energy source used by humans. Biomass is the organic matter that composes the tissues of plants and animals. Biomass can be burned for heating and cooking, and even generating electricity. The most common source of biomass energy is from the burning of wood, but energy can also be generated by burning animal manure (dung), herbaceous plant material (non-wood), peat (partially decomposed plant and animal tissues), or converted biomass such as charcoal (wood that has been partially burned to produce a coal-like substance). The total installed capacity through biomass in end of 2014 is shown in below graph:

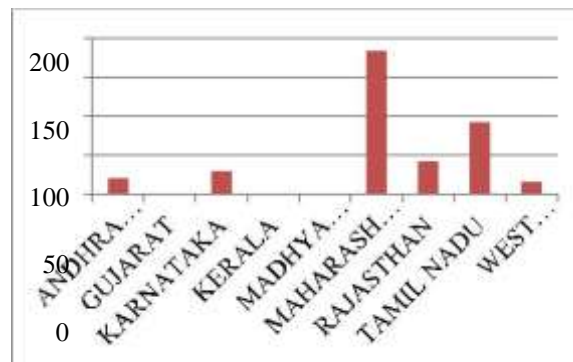


Fig.5 Total installed capacity of biomass in 2014

VIII. POWER REQUIREMENT AND AVAILABILITY

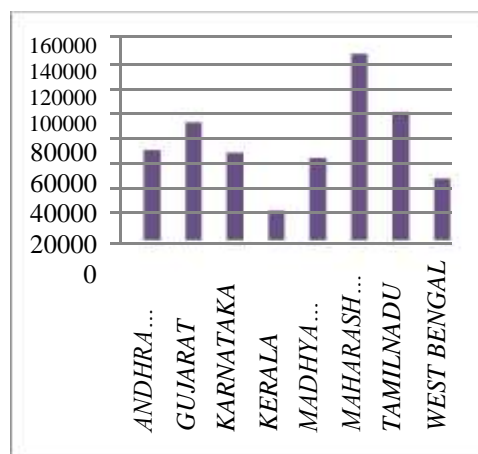


Fig. 7 Anticipated power requirement in year 2015-16

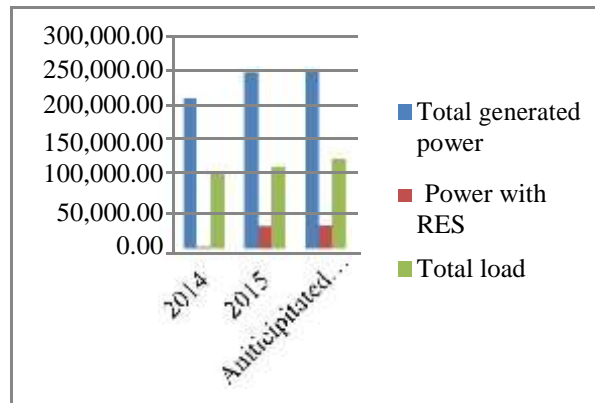


Fig. 9 anticipated load in 2015-16

From above both the graph its clear that the power demand and availability are not equal demand is higher then power availability. And the anticipated load can be full fill by the increasing the generation and new strategy for wastage of power.

IX. CONCLUSION

In this paper India's energy consumption has been increasing at a relatively fast rate due to population growth and economic development, even though the base rate may be somewhat low power trough renewable energy it is clear that power demand is always higher than power availability in India. If India is to move to a higher growth trajectory than is now feasible; it must ensure the reliable availability of energy.

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