

## **INDIAN ENERGY AT PRESENT AND PLANNING TO REDUCE ENERGY PROBLEM AND TO GENERATE ELECTRICITY BY RES(RENEWABLE ENERGY SOURCES)**

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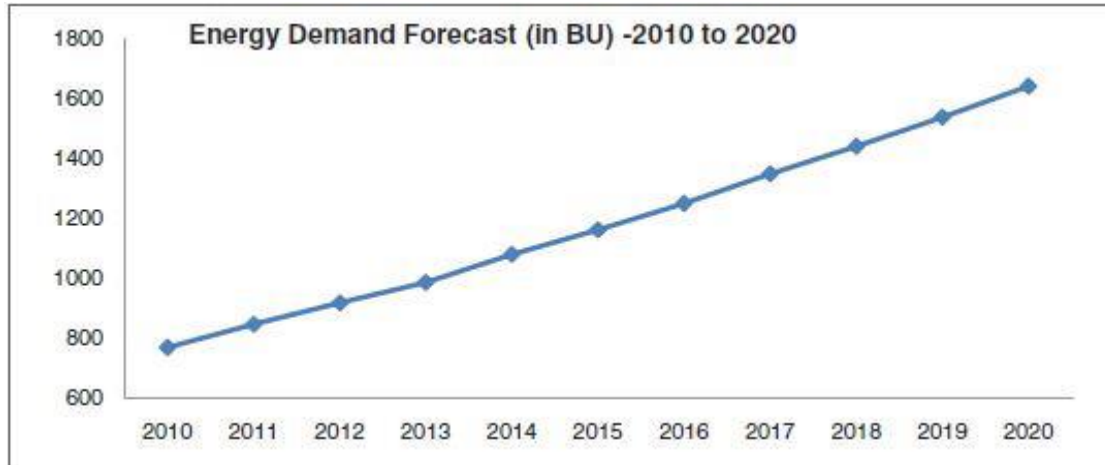
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### 1. INTRODUCTION

India is a country with more than 1.2 billion people accounting for more than 17% of world's population. It is the seventh largest country in the world with total land area of 3,287,263 sq kilometers. India measures 3214 km from north to south and 2993km from east to west. It has a land frontier of 15,200 km and coastline of 7,517 km. India has 28 states and 7 union territories .India is the fourth largest energy consumer in the world after the United States, China, and Russia It faces a formidable challenge in providing adequate energy supplies to users at a reasonable cost. In recent years, India's energy consumption has been increasing at a relatively fast rate due to population growth and economic development. Rapid urbanization and improving standards of living for millions of Indian households, the demand is likely to grow significantly. In order to sustain the production, industries have opted for inefficient diesel-fuelled backup power. India's energy planning, which is based on the twin objectives of high economic growth and providing electricity to all, is failing to meet either. The domestic power demand of India was 918 billion units in 2012. It is expected that at 9.8% annual growth the demand will reach 1,640 billion units by 2020. At this pace, India will require 390 GW in the next eight years which is almost double its current installed capacity of 210 gigawatts (GW). There is growing energy inequity between rural and urban areas and also between the developed and developing states.

India as a country suffers from significant energy poverty and pervasive electricity deficits. In recent years, 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. With an economy projected to grow at 8-9% per annum, rapid urbanization and improving standards of living for millions of Indian households, the demand is likely to grow significantly. As per the estimates made in the Integrated Energy Policy Report of Planning Commission of India, 2006, if the country is to progress on the path of this sustained GDP growth rate during the next 25 years, it would imply quadrupling of its energy needs over 2003-04 levels with a six-fold increase in the requirement of electricity and a quadrupling in the requirement of crude oil. The supply challenge is of such magnitude that there are reasonable apprehensions that severe shortages may occur. There are millions who are yet to be benefited from electricity in rural India. The scarcity of electricity in rural areas in comparison to urban areas seems to be biased in delivery through the centralized system. While the urban-rural difference in energy supply could be reduced through renewable energy, it is more complex to overcome the widening gap between developed and not so developed states. Current centralized energy planning of India is dependent on coal and fossil fuel sources. The main concern arises on how to protect the fossil fuel for our coming generation with simultaneously utilizing the different resources of energy for high and sustained economic growth. Pressure to increase its energy supplies and the consequent negative environmental impact of fossil fuels has led India to a conscious policy toward renewable sources.

Current scenario of energy demand and supply demands the research and development activities in exploration of new reserves. There are huge amount of potential available in the renewable energy system which can be explored and harnessed to meet the energy demand.



Source: [www.greenpeace.org/india/Global/india/report/2014/powering-ahead-with-renewables](http://www.greenpeace.org/india/Global/india/report/2014/powering-ahead-with-renewables).

### Energy demand projection in India

#### 1.PRESENT POWER SCENARIO IN THE COUNTRY

In recent years availability of power in India has both increased and improved but demand has consistently outstripped supply and substantial energy and peak shortages prevailed in

2009-2010. fig show the power generation in India mainly based on these things.

#### 2.List of Projects Commissioned during April 2014

##### Thermal

Salora TPP, Ph-1, U#1, (135MW)Chhattisgarh commissioned on 10/04/14by M/s Vandana Power Ltd

##### Hydro

Nil

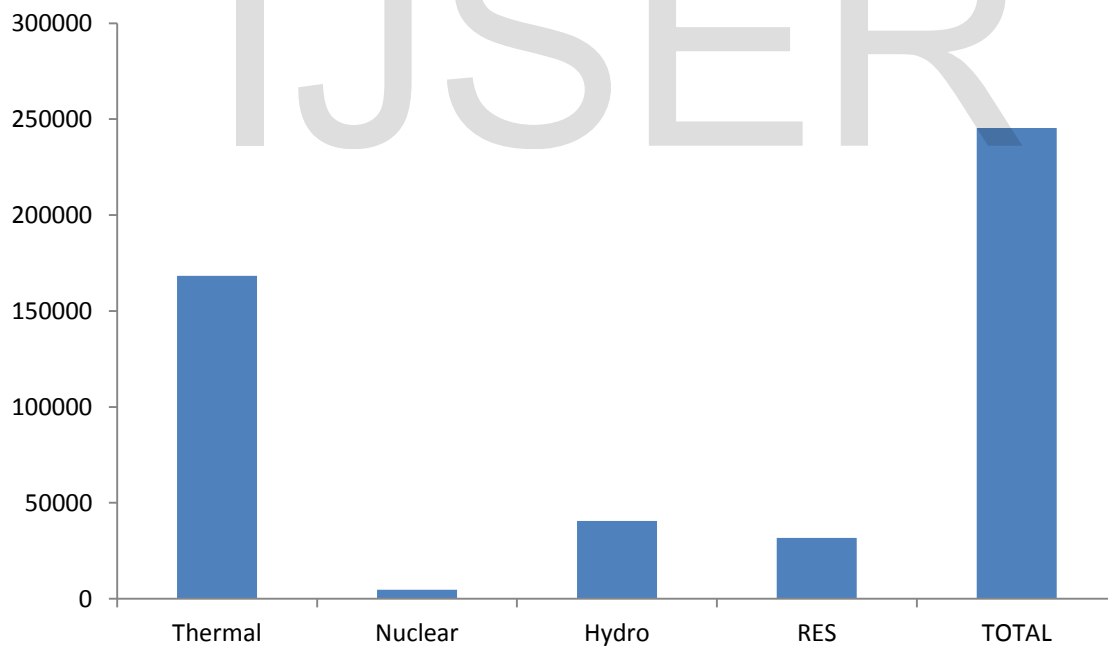
##### Nuclear

Nil

#### 3.All India Installed Capacity (MW) as on 30-04-2014 Region –wise

Region	coal	gas	diesel	Total	Nuclear	Hydro	RES	GRAND
Northern	35283.5	5281.26	12.99	40577.75	1620	16330.76	5935.77	64464.28
Western	58154.51	10139.31	17.48	68311.3	1840	7447.5	11271.07	88869.87
Southern	26582.5	4962.78	939.32	32484.6	1320	11398.03	13784.67	58987.3
Eastern	25327.88	190	17.2	25535.08	0	4113.12	432.86	30081.06
North-east	60	1208.5	142.74	1411.24	0	1242	256.67	2909.91
island	0	0	70.02	70.02	0	0	11.1	81.12
<b>All-India</b>	<b>145408.4</b>	<b>21781.85</b>	<b>1199.75</b>	<b>168390</b>	<b>4780</b>	<b>40531.41</b>	<b>31692.14</b>	<b>245393.5</b>

Total 245393.5MW



**4.Power supply position (Demand & availability) in April 2014**

Region	ENERGY(MW)				Deficit(%)	
	PEAK Demand		Peak Met		April'13	April'14
	april'13	April '14	April'13	April'14		
Northern	24081	23958	22178	22705	-7.9	-5.2
Western	25686	27250	25323	26971	-1.4	-1
Southern	25375	25829	21021	23717	-17.2	-8.2
Eastern	9161	10273	8949	10181	-2.3	-0.9
North-Easrn	901	1024	822	948	-8.8	-7.4
ALL INDIA	85204	88334	78293	84522	-8.1	-4.3

**5.Peak demand/ Peak Met in April 2014**

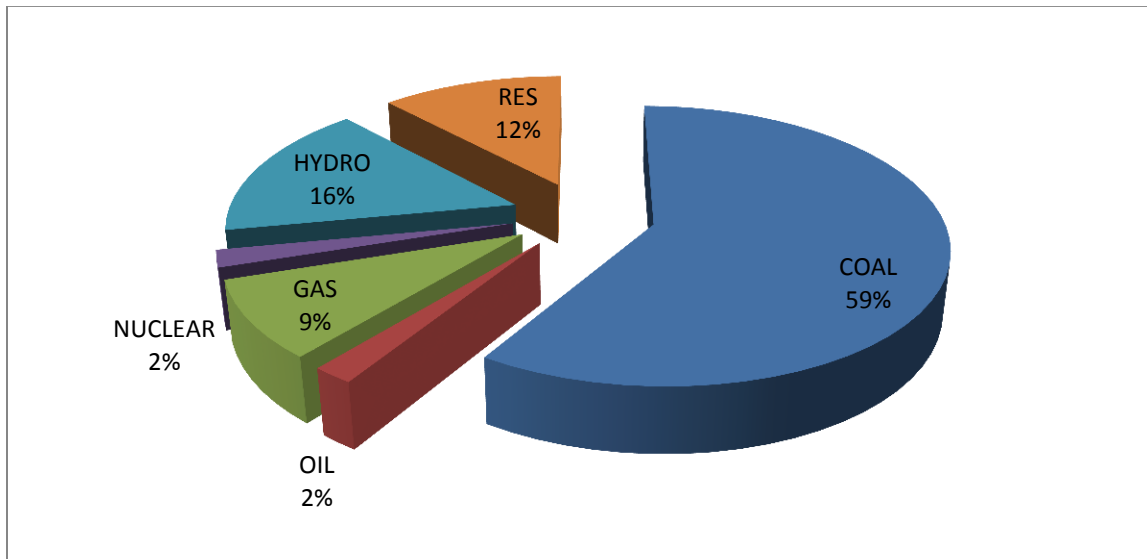
REGION	DEMAND				DEFICIT%	
	PEAK DEMAND		PEAK MET		APRIL'13	APRIL'14
	APRIL'13	APRIL'14	APRIL'13	APRIL'14		
NORTHERN	37674	41222	35764	38163	-5.1	-7.9
WESTERN	37892	41454	37361	40601	-1.4	-2.1
SOUTHERN	39015	39798	32507	36546	-16.7	-8.2
WESTERN	15642	16327	15052	16087	-3.8	-1.5
NORTH-EA	1899	2197	1718	2045	-9.5	-6.9
ALL-INDIA	132122	140998	122402	133442	-7.4	-5.4

India has transitioned from being the world’s seventh-largest energy consumer in 2000 to fourth-largest one within a decade. India’s energy basket has a mix of all the resources available including renewables. The dominance of coal in the energy mix is likely to continue in near future. At present India's coal dependence is borne out from the fact that ~59 % of the total installed electricity generation capacity is coal based. Out of total thermal installed capacity 86% capacity is coal based other renewables such as wind, geothermal, solar, and hydroelectricity represents a 2 percent share of the Indian fuel mix. Nuclear holds a 2% percent share.

Total installed capacity in India is 245393.53MW of which

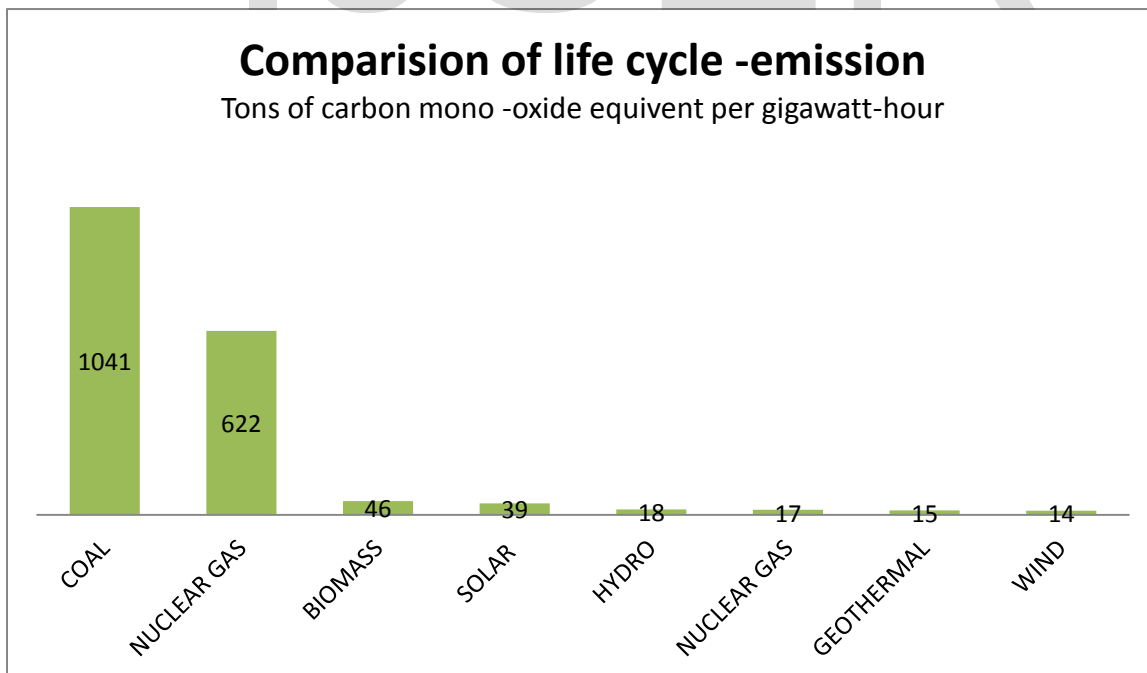
- i. Thermal power account for 69%

ii. Renewable energy account for 13%



PIE CHART SHOW THE PERCENTAGE OF RAW MATERIAL USED

As per we see that we use coal in a high quantity to generate electricity. Firstly it is costly as compare to other energy and emit a lots of  $CO_2$  which is harmful for human and environment. Since global warming is an international phenomenon and it has no boundaries there is an urgent need for the transfer of technology and development of appropriate financial instruments from developed the world to nations who are still trying to find their rightful places. No argument is needed to understand that the world is today facing the problem of global warming due to rapid industrialization and urbanization followed by the western world. In terms of per capita equity India is 145th in the world with a release of 1.25 t  $CO_2$  per annum.



**6. 12th Plan Targets (up to March 2017)**

Technology	Target	Investment required
Wind Power Project	15000MW	US\$15 billion
Small Hydro project	2100MW	US\$2.1billion
Biomass based power projects	2700MW	US\$2.7billion
Grid connected small power project	10000MW	US\$12billion
Off grid small power project	1000MW	US\$1.8billion
Aggregate		US\$33.6billion

CONCLUSION:

As we know that India face many problem such as poverty, global warming ,corruption, limited sources of energy to generate electricity. When we use the Renewable energy sources to generate electricity it is good for both health and economical. The installation cost of solar ,wind ,small hydro plant is high .But these resources is available in abundant quantity and eco-friendly. It emit a very low carbon di oxide and other harmful contaminant. we know that India mainly based on coal consumption and in future it will not meet to our next generation. Coal emitted a high amount of harmful gases. In India the daily average solar energy incident varies from 4-7 kWh/m<sup>2</sup> with about 1,500–2,000 sunshine hours per year (depending upon location), which is far more than current total energy consumption. Solar energy systems (photovoltaic, solar thermal, solar power) provide significant environmental benefits in comparison to the conventional energy sources, thus contributing, to the sustainable development of human activities. Solar energy is genesis for all form of energy. This energy can be made use of in two ways the Thermal route i.e. using heat for drying , heating ,cooking or generation of electricity or through the photovoltaic route which converts solar energy in to electricity that can be used for a myriad Purpose such as lighting, pumping and generation of electricity. With its pollution free nature, virtually inexhaustible supply and global distribution- solar energy is very attractive energy resource.

Wind energy is one of the most promising alternative energy technologies of the future. During recent years, the amount of energy produced by wind-driven turbines has increased rapidly due to considerable advancement in turbine technologies, making wind power economically compatible with conventional sources of energy. The use of wind power in India has been gaining importance with rapid installation in the last few years. Wind energy makes up the majority about 68 per cent of the total renewable energy capacity installed in India. Initial estimates from Centre for Wind Energy Technology (C-WET) suggest that wind energy potential at 80 meters height (with 2 per cent land availability) would be over 100 GW. Some studies have estimated even higher potential ranges up to 300 GW. By the end of October 2013, India had a total installed capacity of 19,933 megawatt (MW), with 1,699 MW installed in 2012-13. The total wind power generation in 2011-12 was 23,399.5 gigawatt hour (GWh), or about three and a half times the output of a new 1,000-MW nuclear reactor. The 12th Five Year Plan aims to install 15,000 MW between 2012 and 2017,

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