

POSITION OF PRESENT POWER RESOURCES IN INDIA

Dr. Poonam Rani*

ABSTRACT

At the outset, it is desirable to study and assess the existing and potential commercial and non-commercial power resources of India in order to fully acquaint with the power sector of the country. The various resources of electrical energy can broadly be grouped under two heads, namely conventional power resources and non-conventional power resources. Conventional power resources are commercial in nature and include hydel, thermal, nuclear and oil and natural gas. Conversely, non-conventional power resources are those which are limited in use and have not yet been harnessed for commercial purposes. Non-conventional power resources are renewable and include solar, tidal, geo-thermal and wind resources of power.

KEYWORDS: Power Resources, Electrical Energy, Conventional Power, Non-conventional Power.

Introduction

Hydro-Power

Hydro-Power potential of the country has been assessed at 125,570 MW at 60% load factor. India is ranked fourth globally by underutilized hydro power potential. The availability of larger hydro potential in Northern, Southern and North-Eastern regions reduces, to some extent, the differences which arise from the very uneven distribution of coal reserves. The chief coal producing states of West Bengal and Bihar are not well favoured with respect to hydro-resources. On the other hand, a number of states in the southern, northern and North-Eastern regions which have no coal producing areas, are well endowed with hydro-electric potential. Thus, outlook for hydro resources is bright and existing known potential of hydro-electric power can be judged to make sizeable contribution to the total power output in future and it seems likely that estimates of potential will continue to be revised upwards.

Thermal Power

Coal based thermal power plants have been the major resource of power generation in India. Coal is the most versatile and oldest form of energy in India. It occupies an important place in the power strategy of the country due to its potential availability.

The distribution of coal reserve in different states and category-wise is shown in Table.

* Associate Professor, Commerce Department, A.S.[P.G.] College Mawana, Meerut, U.P., India.

State-wise Distribution of Coal Reserves

{Million Tones}

State	{Proved}	{Indicated}
Jharkhand	45563	31439
Odisha	37391	34165
Chhattisgarh	20428	34576
West Bengal	14156	12869
Madhya Pradesh	11958	12154
Telangana	10475	8576
Maharashtra	7118	3074
Andhra Pradesh	0	1149
Bihar	161	813
Uttar Pradesh	884	178
Meghalaya	89	17
Assam	465	57
Nagaland	9	0
Sikkim	0	58
Arunachal Pradesh	31	40

{Source : Geological Survey of India}

The formation-wise and category-wise coal resources of India as on 01-04-2018 are given in Table

	Proved/Measured	Indicated	Inferred	Total
Gondwana Coals	148194	139065	30174	317433
Tertiary Coals	594	99	895	1588
Grand Total	148787	139164	31069	319020

India Coals are by and large, very high in non combustible inserts, i.e as hand sulphur contents. Only about 15% of the total reserves of coal are estimated to belong to superior quality coal and 30% coal is put under moderately good quality whereas the rest 55% of the reserves are of inferior quality, which is mainly used in thermal power, brick burning, rail traction and other industrial and domestic uses.

The Coal deposits of India are distributed very unevenly between different regions of the country. Therefore, long and cheap transportation is necessary to supply coal to coal-deficit regions, particularly if coal has to be brought from the dominant producing areas of Jharkhand, Odisha and Chhattisgarh, where the industry originally developed.

Nuclear Power

Resources of nuclear power in India consists of Uranium and Thorium. As on February 2021, a total of 350,438 tonne[+] in situ U_3O_8 {297170+U} has been established in forty four uranium deposits in Andhra Pradesh, Telangana, Jharkhand, Meghalaya, Rajasthan, Karnataka, Chhattisgarh, U.P., Uttarakhand, Himanchal Pradesh and Maharashtra. As of 31 March 2019, India had 6.78 GW of installed nuclear power generation capacity or nearly 2% of total installed utility power generation capacity.

Oil and Natural Gas

The proved reserve of oil and natural gas in India are at present exceedingly small. India depends on imports to meet more than 80% of its requirements. The largest reserves are found in the Western Offshore Mumbai high, Krishna Godavari Basin 40% and Assam 27%. On 31 March 2019, India has estimated crude oil reserves of 618.95 Million tones MT, increasing by 4.1% from the previous year. The largest reserves of natural gas are located in the Eastern offshore 38.13% and the Western offshore 23.33%.

Solar Power

Solar power has the greatest potential for India in the long run because of the large amounts of solar radiation which it receive thought the year.

Although solar power is an attractive sources power for India, but the present technology of collection and storage, solar power is not competitive for large scale power generation. It means can be developed of exploiting solar power would have a profound implication for meeting the growing power

needs of India. Conversion of solar power into electricity can be achieved with present techniques at a very high cost and a substantial fall in cost is likely to take a long period of further research and development work.

Wind Power

The use of wind for power generation is possible in parts of the country where the velocity of wind is above 10 Kmph. Winds speeds over 10 Kmph are prevalent over parts of coastal regions Tamilnadu, Rajsasthan, Gujrat, Maharashtra and Mysore.

Month wise Measured Wing Speed

Month	Nov.17	Dec.17	Jan.18
Winds	6.06	7.14	5.13
Month	Feb.18	March.18	April.18
Winds	6.39	7.11	6.90
Month	May.18	June.18	July.18
Winds	8.71	9.82	10.58
Month	Aug.18	Sep.18	Oct.18
Winds	9.81	6.94	4.85

Tidal Power

Countries like France, U.S.A., Canada, U.K., China and Argentina have successfully harnessed the tidal power for electricity generation. Having a long coast line of about 35,630 Miles, a number of possible sites for harnessing the total power have also been identified in India. Three potential sites have so far been identified in India, namely the cambay on the west coast in Gujrat, the Gulfs of kutch and Sunderbans along the east coast in West Bengal. The maximum tidal range in Cambay, Kutch and Sunderbans are 11m, 8m and 5m.

Geo-Thermal Power

Geo-thermal power potential in India appears to be very limited. According to the Geological Survey of India, the perspective geo-thermal regions in India where the generation of geo-thermal power is possible are North-West Himalayan ranges covering areas in Laddakh, Himanchal Pradesh, Punjab and U.P. West Coast {Western Maharashtra, Gujrat region}, Narmada-Son Valley land Damodar Valley. Geo-thermal power, if tappable, can be a highly competitive form of power.

Conclusion

We have reviewed the existing power resources of India, both commercial and non-commercial and have also established their efficiency in the long run. Proved and indicated reserves of coal in India are fairly adequate for 100 years. However, they are very unevenly distributed over the parts of the country. This calls for increase in transport capacities in accordance with the increase in demand for coal. Coal as such, will be the immediate adequate source of power for the unretarded pace of economic development of the country for the coming years, provided that concerted efforts to increase production and transport capacities are made. India's existing oil and natural gas reserves are exceedingly a small, they are likely to be substitute for oils in inescapable. Simultaneously, in view of the over increasing import bill for petroleum accelerated efforts are needed to explore the potential oil bearing area in the country. Among the non-conventional renewable commercial power resources of the country, ie, solar power, geo-thermal power, tidal power and wind power, solar power has vast potentials in the long run to meet the growing power needs of India.

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