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Geothermal Energy in India

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ABSTRACT

Except for a few sporadic and half-hearted attempts Government, officially, has done practically nothing to exploit this vast reserve of FREE energy. And unlike in the sectors of wind and solar energy, no benefits or incentives have been formulated or announced to attract investment in geothermal energy and to induce private parties to explore and exploit this sector.

Keywords: Geothermal Resources, Geothermal power generating , Government resolution (No REP-102000-502-B) , "Electricity Credit Note", MNES (Ministry of Non-Conventional Energy Sources), Scheme for energy generation through renewable energy soruces - 2001, Third party sale of power

Given this state of affairs and the indifferent attitude of most State (local) governments to pursue geothermal sources of power, and the absence of any stand on geothermal power on the part of the Central Government, it is not surprising that on the world map India does not figure anywhere as far as geothermal power is concerned.

Mr Avinash Brahmbhatt, Managing Director of Avin Energy Systems Ltd, seems to be the only person who has made efforts to exploit geothermal energy to generate power in the State of Gujarat in Western India. He claims to have made a study of the geothermal resources of the region, identified most likely spots and prepared a detailed project report. However, for some reason or the other Government (State and Central) do not seem excited or even interested in helping (directly or indirectly) to get the project moving. In fact only private investors have, so far, shown concrete interest in promoting this geothermal power project. If in the near or distant future, geothermal power generating projects do come up all over India, it will not be due to any encouragement by Government.
The latest news is that Government of Gujarat has framed a new policy and pased a government resolution (No REP-102000-502-B) aimed at formulating an incentive policy for solar photo voltaic, geothermal, waste utilization, biomass, etc. Under this Policy

- project promoters in any of these categories wishing to set up power generating projects to sell power to Gujarat Electricity Board shall have to enter into a power purchase agreement at Rs. 2.25 per unit (1994-95 as base with 5% escalation in rate every year for a period of 10 years from date of commencement of generation of power)
- Investor shall lay down power evacuating lines to the grid lines of GEB at his own cost
- Metering at site shall be done by Gujarat Energy Development Agency and GEB jointly and GEB shall make payment within 30 days of receipt of invoice. An "Electricity Credit Note" shall be issued by GEB to the power supplier which can be transferred to any HT consumer of GEB who can adjust his electricity bills against the "credit note".
- Wheeling charges of 4% of the generated units shall be deducted.
- Third party sale of power shall be permitted subject to payment of 4% wheeling charges.
- Banking for a period of 12 months shall be permitted by GEB
- GEDA will function as nodal agency for the purpose of implementation of this scheme.
- Investors will submit applications to GEDA in prescribed form and for grid interface to GEB along with a payment of Rs. 200000 per MW (to cover incidental expenses)
- Investor shall prepare and submit a detailed project report within 6 months from date of "in principle" approval to be got approved from E&PCD department of Government of Gujarat..
- Other approvals/NOC shall be required for the project and have to be arranged/obtained by the investor.
- Once these procedures are completed investor shall enter into PPA/wheeling agreement/third party sale, etc. in consultation with EPD in Government of Gujarat.
- If investor does not take "effective steps" to implement project within 12 months from date of government approval of the project, government shall terminate approval without any further notice. "Effective steps" is interpreted as incurring at least 25% of project cost within 12 months from date of government order allocating the project.

Let us see how progressive this policy proves to be.

As the situation stands, in rural areas of Gujarat power supply by GEB is drastically curtailed and even industries have to observe 2 days' staggering.

Whether prospective investors will be willing to shell out Rs. 2 lacs per MW of power intended to be produced remains to be seen.

Geothermal power generation in India
Current Massive Power Shortages in India are forcing industries in parts of the country to operate only 4 days a week. Agricultural sector is also affected and the future prospects of electricity from coal or petroleum products or hydro sources do

not appear any too bright. Cost of conventional fuels keeps rising and so does the cost of electricity.

In this context given the non-polluting characteristics of geothermal power and the inexhaustible supply available, India ought to take immediate steps to exploit this source of energy.

Realising the vast potential of geothermal energy, says Mr Brahmbhatt, I started studying this subject about 10 years back and have compiled data and made studies on the most likely spots in Gujarat and India which will give high yields and returns in Geothermal Energy.

Hoping to help ease the power shortage and contain the environmental pollution caused by coal and petro based power generating stations, he continues, I prepared a detailed project report and approached the State and Central Government to find out if they would be interested in directly or indirectly funding the project. Sad to say present policies of the Governments do not have any defined stand on geothermal power and with the deregulation of power all they can offer is a power purchase agreement. I applied for a power purchase agreement and for some reason or the other this matter is being delayed. I have been to Delhi and met authorities of MNES (Ministry of Non-Conventional Energy Sources) who stated that geothermal energy and its exploration and exloitation is outside their purview of operations. In fact I came up against a blank stone wall.
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Even requests to the State Government to help in acquisition of the land has not elicited any positive response.

All I am told is : "produce all the power you can : we will buy it all!" The only bright star on the horizon is that negotiations are on with private investors and pretty soon I hope to commence on the project.

The government of Gujarat has now come up with an "incentive scheme for energy generation through renewable energy soruces - 2001 and passed resolution No REP-102000-502-B, salient points of which are given below...

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An investor in say geothermal power project of 50 MW would be first of all required to shell out Rs. 1000,000 to GEDA (incidental expenses ?!). Against this he gets no observable tangible benefit and has to undergo all procedures on his own starting from procurement of land to obtaining all government permissions and NOCs. Where are the incentives?

To Renewable Energy Development in India

In the past energy planners and policy makers in India have generally supported conventional sources of energy for a variety of social and political reasons. Coal and oil based thermal power was preferred to hydel power due to its short gestation period, marginal physical displacement of people and pressure of donor agencies. The high initial costs, the generally slow build up of loads and high transmission and distribution losses of conventional energy production and utilization were accepted as a trade off in centrally planned public sector operations. Although subsidies and financial incentives were given liberally to RETs these technologies remained marginalized in the overall energy scenario. The total investment in renewables was too small and mostly on an experimental basis for demonstration purposes without any long term planning or commitment.

A closer look at some of the financial incentives for renewables reveals that for a variety of reasons they sometimes even worked against the development of renewable technologies. While working out cost benefit analysis and calculating internal rate of return for any power project, hidden or indirect subsidies on pricing on resources and infrastructure were never taken into account in the case of conventional sources of energy. On the other hand, economic analysis of renewable energy project rarely supported their economic justification. Most projects were supported for their renewable nature and social and environmental benefits. There are a number of instances which clearly demonstrate the need to create a level playing field enabling renewables to compete with conventional sources of energy. On the other hand economic analysis of renewable energy project rarely supported their economic justification. Most projects were supported for their renewable nature and social and environmental benefits. There are a number of instances which clearly demonstrate the need to create a level playing field enabling renewables to compete with conventional sources of energy in India.

The diffusion of RETs involves a number of institutions and much depends upon the structure and ability of these institutions to successfully implement renewable energy programmes. Institutional issues in renewable energy systems

have assued a special significance in the recent times in light of the economic reforms taking place in India and the growing gap between demand and supply of energy services.

FINANCIAL BARRIERS

The viability of various technologies varies depending upon the location and context which is related to the technical input output parametric relationships. Extending these to financial results in using their opportunity costs poses a real challenge for the energy planner. Because of difficulties in calculating realistic costs and benefits of renewable energy projects, financial barriers act as a critical constraint to the dissemination of RETs in India.

Lack of adequate financial resources has been a chronic problem for commercialization of RETs. In the initial phase of development of any new technology institutional financing becomes particularly important in accelerating market linkages. The initial investment risk in renewable energy is greater since they are neither proven nor in high demand, making coverage of venture risk an important aspect of financial arrangements. It is often argued that many times it is risk coverage rather than capital cost that is a limiting factor in rapid commercialization of RETs.

In India power tariffs are highly underpriced and subsidized, especially for the rural sector and in some notified industrial areas. While considering cost benefits of RETs such direct subsidy on cost of power and indirect subsidy by way of subsidy on freight and coal are never calculated and hence conventional power costs are always more attractive and affordable than RETs. Power tariffs need to be rationalized and subsidies (except where they directly benefit the very poor) need to be abolished completely which would make RETs viable. Another sore point is funding and financing of installation of RETs. Most banks and institutions have cumbersome procedures which discourage probable investors. These are capital intensive equipments and procedures should be simplified with a single window application submission and disbursal with very low rates of interests to encourage investment. Even IREDA, set up specifically to fund RETs has a set of cumbersome procedures, like any other institution.

Government was offering a substantial amount as subsidy to encourage investment and this has led to the formation of a subsidy mindset amongst users. Now that the subsidy on some RETs has been abolished/reduced substantially, this mindset of expecting subsidy is again acting as a deterrent. Most people now prefer to "wait and see" until subsidy is announced.

Another main barrier as perceived by some is government policy. To popularize and promote RETs nodal agencies were set up in each State of India. In addition government has set up a rigid guideline that for equipments to be eligible for subsidy they should conform to BIS standards. Each nodal agency handles subsidy disbursal and also approval of recognition of manufacturers whose products "conform" to standards and thus are eligible for subsidy. This has led to formation of a closed circle in manufacturing with a few manufacturers cornering the entire market. In the name of "standardization" and "registration" innovation has been totally crippled and even if we search we are not likely to get low cost or cheap RETs using low cost materials. And unless supplied by government, NGO, or a voluntary agency, it is almost impossible to find a poor household making use of solar water heating systems or solar cookers.

A Multiplicity of government agencies and institutional structures are also responsible . At the national level we have MNES, the Planning Commission, Ministries of Agriculture and Rural Development, Science and Technology, Biotechnology and Environment and Forests. At the State level there are Nodal agencies, Departments of Agriculture, Rural Development, Science and Technology, Biotechnology, Environment and Forests and the State Electricity Boards. There is duplication, overlapping and lack of co-ordination in the implementation of renewable eergy programmes. A bureaucratic structure with a target oriented approach has led to rigidity in instructions and a centralized lanning process is virtually choking the growth and spread of RETs. The nodal agencies employ highly qualified technical personnel who, however, instead of being involved in actual development and refinement of technologies and products, have to spend most of their time in paperwork.

Another barrier to growth and popularization of renewables is that there is no university offering exclusive degree/diploma course in renewables. Even in schools and at homes environment and renewables are not given due importance or acceptance. .

Unless there is a sea change in government policy and outlook, peoples' perception of renewables and of environment, RETs will not reach the grassroots level in the foreseable near or distant future.