

**AN EMPIRICAL PROPOSAL ON THE ANALYSIS OF ENERGY USAGE PATTERNS
AND FACTORS IN RURAL AREA OF MAHARASHTRA**

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ABSTRACT

The off-framework remain solitary frameworks on renewable energy either spare the traditional power or create the same in decentralized littler scale. Indeed they function as smaller than normal or miniaturized scale power plants in circulated structure. They have an extraordinary total impact albeit separately they look inconsequential. Since its initiation, MEDA has spread, advanced the utilization and conveyed an extensive number of non-routine and renewable energy gadgets. Govt. sponsorships and financial motivating forces upheld the projects. Sun powered water radiator, sunlight based cooker,

sun based lighting frameworks, enhanced wood stoves (chulhas), windmills, biogas plants, and so on have been disseminated and introduced everywhere throughout the State. MEDA now has sufficiently increased experience with respect to every one of these frameworks.

Keywords - Energy Management, Sustainable Development, Energy Optimization

INTRODUCTION

The initial challenge was to develop practically adaptable renewable energy devices. This work was

carried out till 1980s by many reputed institutions having separate energy departments such as IITs, Universities and R & D Centres. Thereafter, many devices were distributed and tested for their viability in the field. The NRSE systems were initially distributed with large amount of subsidies ranging from 50 to 90 % of the cost. Based on the field reports and acceptance by the society, only a few of the systems such as solar water heaters and wind power plants got commercialized. Most of the items still need Govt. support for marketing. It is encouraging to note that the renewable energy devices and technologies are now considered as marketable commodities even without subsidy.

RURAL VILLAGE ELECTRIFICATION

Ministry of New & Renewable Energy (MNRE) has initiated Remote village electrification program with an objective to electrify remote census villages and remote hamlets of electrified census villages through non-conventional energy sources such as solar energy, small hydro power, biomass, wind energy, hybrid systems, etc. Implementation of the program will help to achieve the goal of 100% village electrification in the country by 2012. By focusing on remote census villages and remote hamlets of electrified census villages, the program aims at bringing the benefits of electricity to people living in the most backward and deprived regions of the country.

The program will, inter ally, cover the following activities: -

Support for surveys and studies if required for firming up of State-wise lists of remote un electrified census villages or remote hamlets of electrified census villages; assessing the renewable energy sources available in the villages and energy requirements of the community; and, identification of appropriate technology options for electrification. Preparation of State-wise Master Plans using such techniques as GIS based mapping etc.

Support for Installation of Power Plants based on solar energy, small hydro power, biomass, wind and other renewable energy sources; combination of renewable energy systems, or hybrid systems including a small contribution from Diesel or other fuels, if required; and, solar home systems, lighting and other systems for community purposes.

Support for Training, institutional development, capacity building, development of maintenance services, etc.

Support for Monitoring and evaluation of individual projects, or the program as a whole, including technical, operational, and socio-economic aspects, user feedback, impact assessment, etc., development of management information systems for proper coordination and monitoring , etc.

Support for training and awareness program. Targeted at various categories of personnel, stakeholders' meeting / conference, etc.

Support for development of remote village specific electricity generation systems and packages based on different non-conventional energy technologies.

Electrification of such un electrified remote census villages based on Ministry of New & Renewable Energy (MNRE), GoI, New Delhi guidelines is the main objective of Maharashtra Energy Development Agency (MEDA). The un electrified remote census villages which will not be electrified by conventional means by the end of the eleventh Plan (2012), as certified by the concerned Power Department / State Electricity Board, will be eligible for coverage under the program. To ensure effective operation, maintenance and sustainability of the projects, efforts are made to secure the participation of the local community from inception. Appropriate arrangements will be made for long term operation and maintenance, preferably for a period of 5 / 10 years, with a view to provide electricity supply for 3 to 4 hrs in remote villages and remote hamlets. A suitable Annual Maintenance Contract (AMC) for a minimum period of 5 / 10 years is included, which includes replacement of parts or components such as batteries, electronics, lamps, bulbs, etc. for securing proper and sustained energy supply services. The warranty and after-sales-service obligations will be strictly enforced. To ensure sustainability of the projects which for some reason are not covered by the 10 year AMC as above, revenue generation from beneficiaries is be made mandatory through collection of user charges upfront and / or on annual / monthly basis.

The revenue so generated will be utilized for meeting the operation expenses or any other contingent expenditure. It will also be utilized towards maintenance and repair expenses or replacement of parts and components, after the expiry of the AMC.

Central Financial Assistance (CFA) up to 70% of the cost of the projects is provided as grant for electrification of remote un electrified census villages and remote hamlets of electrified census villages under this program, with specific benchmarks as applicable in respect of the technologies adopted for electrification. The balance 30% cost of projects for remote village and remote hamlets Electrification can be financed through sources such as State Govt. PMGY, MNP, RIDF, Ministry of Tribal Affairs, MPLAD / MLA LAD and the corporate sectors. The implementing agencies is free to raise funds from these and other sources, such as REC, PFC, etc., including users to meet their share of cost of the project.

Maharashtra Energy Development Agency (MEDA) being State Nodal Agency is implementing the RVE program in the state of Maharashtra. Maharashtra State Electricity Distribution Company Limited (MAHADISCOM) earlier MSEB has forwarded MEDA the list of un-electrified villages. MEDA carry out survey of such villages departmentally or with the help of consultant of these field and forwarded Detailed Project Reports (DPR) to Ministry of New & Renewable Energy (MNRE), GoI, New Delhi for Central Finance Assistance and to State Government for the provision of balance

funds. The projects are implemented through tendering after receipt of sanction. The brief information on the technology adopted / proposed for the electrification at sanctioned villages is as under;

SPV DOMESTIC LIGHTING SYSTEM

The system comprises 2 or 4 nos. of 9W CFL of high luminous efficiency (light output equivalent to a 60W incandescent lamp) with built-in inverter, SPV Panel, charge controller, storage battery & indoor luminaries. SPV Community systems are suitable for powering lamps and a D.C fan (of 20 watts capacity).

SPV STREET LIGHTING SYSTEM

System with 11 W Compact Fluorescent Lamps (CFL) has the unique feature of switching 'ON' at dusk and 'OFF' at dawn automatically. The system comprises SPV Panel, battery and luminaries fittings mounted suitably on a pole.

SPV POWER PLANT

Conversion of Solar Energy into Electrical Energy is called Solar Photovoltaic Energy. The main component of this plant are Solar Photovoltaic modules, Inverter, Battery, Electronics controls, Control room, Transmission and Distribution systems, poles for Street lighting, Compact Fluorescent Tubes (CFL) of 11 watts used in households and in street lighting. The electricity is stored in battery bank through the Solar Photovoltaic panels of the required capacity. The individuals then use the stored / generated electricity transmitted through inverter, Transmission and Distribution line, poles and CFL of 11 watts.

Part of a series on Renewable energy includes the following aspects and dimensions

- Biofuel
- Biomass
- Geothermal
- Hydropower
- Solar energy
- Tidal power
- Wave power
- Wind power

Ministry of Energy, New and Renewable Energy Maharashtra or MAHAURJA is a ministry of Government of Maharashtra.

The ministry is currently headed by Chandrashekhar Bawankule, a Cabinet Minister.

The Ministry is mainly responsible for research and development, intellectual property protection, and international cooperation, promotion, and coordination in renewable energy sources such as wind power, small hydro, biogas, and solar power. The broad aim of the Ministry is to develop and deploy new and renewable energy for supplementing the energy requirements of India.

The ministry is headquartered in Mantralaya, Mumbai, Mumbai. According to the Central New and Renewable Energy Ministry's 2012–2013 annual report, India has made significant advances in several renewable energy sectors which include, Solar energy, Wind power, and Hydroelectricity.

PROPOSED GOVERNMENT MISSION

The mission of the Ministry is to bring in Energy Security; Increase the share of clean power; increase Energy Availability and Access; improve Energy Affordability; and maximise Energy Equity.

Key functional area

The major functional area or Allocation of Business of MNRE are:

- Commission for Additional Sources of Energy (CASE);
- Indian Renewable Energy Development Agency (IREDA);
- Integrated Rural Energy Programme (IREP);
- Research and development of Biogas and programmes relating to Biogas units;
- Solar Energy including Solar Photovoltaic devices and their development, production and applications;
- Programme relating to improved chulhas and research and development thereof;
- All matters relating to small/mini/micro hydel projects of and below 25 MW capacities;
- Research and development of other non-conventional/renewable sources of energy and programmes relating thereto;
- Tidal energy;
- Geothermal Energy;

- Biofuel

CONCLUSION

The government is taking effective steps and initiatives to cope up with the energy harvesting and management issues. There is need to develop a superior and high quality game plan so that the effective load balancing and management on energy can be done.

REFERENCES

- [1] MahaUrja Official URL www.mahaurja.com
- [2] Ashok, S., & Banerjee, R. (2001). An optimization mode for industrial load management. *Power Systems, IEEE Transactions on*, 16(4), 879-884.
- [3] Reddy, B. S., & Parikh, J. K. (1997). Economic and environmental impacts of demand side management programmes. *Energy Policy*, 25(3), 349-356.
- [4] Sant, G., & Dixit, S. (2000). Least cost power planning: case study of Maharashtra state. *Energy for sustainable development*, 4(1), 13-28.
- [5] Zia, H., & Devadas, V. (2007). Energy management in Lucknow city. *Energy Policy*, 35(10), 4847-4868.
- [6] Banerjee, R., & Parikh, J. K. (1993). Demand side management in power planning: an exercise for HT industries in Maharashtra. *Economic and Political Weekly*, 1659-1670.

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- [7] Kulkarni, V. A., & Katti, P. K. (2010, October). Efficient utilization of energy in industry energy management perspective. In *Power System Technology (POWERCON), 2010 International Conference on* (pp. 1-7). IEEE.