

ANALYSIS ON ENERGY MANAGEMENT IN INDIA: ENVIRONMENTAL IMPLICATIONS OF CURRENT ENERGY USE PATTERNS

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ABSTRACT

While fossil fuels will be the main fuels for thermal power, there is fear that they get exhausted eventually in this century. Therefore many countries are trying other systems based on non-conventional and renewable sources. These are solar, wind, sea, geothermal and biomass, after making a detailed preliminary analysis of biomass energy, geothermal energy, ocean thermal energy, tidal energy and wind energy. In wind power, I have studied mechanical design of various types of wind turbines, their merits, demerits and applications, isolated and grid-connected wind energy systems with special attention to power quality.

Keywords:- Energy, Development, Natural

1. INTRODUCTION

Vitality is the key contribution for financial advancement of any country. The quick industrialization and fast urbanization other than motorized cultivating have created a popularity of vitality in all structures i.e., Thermal, Mechanical and Electrical. To take care of this over expanding demand, fossil fuel, for example, coal, oil and normal gas have been over abused in an unsustainable way. The over misuse of fossil fuel have been acting genuine ecological issues such like a dangerous atmospheric deviation and

environmental change. Be that as it may, we have deficiency of vitality and more subject to imports on account of petroleum, we are sufficiently lucky to be honored with a lot of regular assets of vitality (non-routine vitality sources, for example, sun based, wind, bio mass and hydroelectric force. These sources are ecologically great and bounty accessible from nature in most part of the nation consistently.

Proceeded with reliance on bio mass powers has brought about genuine natural issues of asset debasement and

contamination with nearby and worldwide appearances. Likewise, personal satisfaction stays poor especially that of ladies who are the essential gatherers, processors, and clients of biomass. The expansion sought after for vitality, coming from both populace and salary development, combined with the restricted effect so far of interest decrease and proficiency upgrading mediations, for example, enhanced cooks stoves and bio gas, keeps on heightening the progressions of country vitality.

Absence of a composed supply of vitality to the provincial ranges additionally has a shrouded fetched. Vitality is a prime mover in monetary advancement. Per capita vitality utilization is straightforwardly related to the general personal satisfaction of the individual. Absence of vitality is among the key impeding strengths avoiding monetary improvement and thus backing off destitution mitigation and development of the provincial area. The seriousness of the issue keeps on rising and requires a re-look, to gain from past experience and build up a crisp endeavor to quicken the way toward giving dependable vitality to the provincial territories of India.

Renewable Energy Technologies (RETs) have for some time been perceived for their potential as environment cordial, adaptable and supportable vitality choices for rustic masses of India. Nonetheless, notwithstanding endeavors by the Ministry of Non-Conventional Energy, RETs have not yet succeeded as a noteworthy option wellspring of vitality in provincial India. The modified of Ministry of New and

Renewable Energy Sources (MNRE) and Indian Renewable Energy Development Agency (IREDA) intended to bolster little scale circulating frameworks have depended on intensely sponsored credit, innovation preparing and customer mindfulness exercises to substitute the business sector for end-client fund for renewable vitality frameworks (Solar and Bio gas) for household use and a layered arrangement of capital and loan fee appropriations for water pumping in the rural part, while end clients in some rustic regions now have admittance to sun oriented, controlled lamps or lights and bio gas frameworks for their home and farming administrators are exploiting wonderful capital endowments for sun oriented vitality to use for water pumping, the control of the credit and assets by an operator in the middle with constrained scope in country regions, the utilization of overwhelming capital and financing cost endowments, and the attention on residential utilize as opposed to on showcasing renewable vitality innovation applications with pay improvement open doors have tied the achievement of these projects to government spending plans and political cycle restricting both the expansiveness and profundity of advancement infiltration of tasks that tackle renewable vitality sources.

The Indian economy has encountered gigantic development in the course of recent years. Vitality in every one of its structures, supports both past and future development. For the Indian economy to proceed with its direction needs to address its vitality challenges, which cross all areas and effect all residents.

Power – both as far as amount and get to – is a key test. To meet this test an option source in particular, non-routine vitality sources should be created and put to utilize.

2. REVIEW OF LITERATURE

Vast populace and low per capita salary make the vitality arranging in India not the same as those of created economies. Various team/boards of trustees have been set up in the past to study and survey India's vitality strategy and related issues. The noticeable among them are the Energy Survey Committee Report (1964), Fuel Policy Committee Report (1974), Working Group on Energy Policy (1979), Planning Commission Study Report on Energy Demand Modeling (1981), Advisory Board on Energy (1985), Energy Demand Screening Group (1986), Renewable Power Purchase Guidelines (1993), Committee on Integrated Coal Policy (1996), Common Minimum National Action Plan for Power (1996), New Exploration and Licensing Policy (1997), Energy Conservation Action (2001), Electricity Act (2003), National Electricity Policy (2005), National Tariff Policy (2006), Rural Electrification Policy (2006), Integrated Energy Policy Report (Planning Commission) (2006), National Action Plan on Climate Change (NAPCC) (2008), and Central Electricity Regulations on renewable vitality (2009). These reports have made number of suggestions relating the routine and nonconventional types of vitality, vitality protection, and vitality arranging and future strategy choices. The whole world is thinking about the issue of

intense deficiency of vitality, which is so basic for all formative exercises. To take care of the regularly expanding demand, fossil fills, for example, coal, oil and common gas have been overexploited in an unsustainable way. In this basic circumstance, new and renewable wellsprings of vitality are most feasible choices for the future, which is free from contamination and locally accessible in plenitude. Various local, national and global level studies were completed in the field of non-routine vitality.

The prior studies relating to investigative and specialized in nature are rejected from writing survey. The swearing off passages drill down the different studies made before:

Laurie (1950) 1 recorded the utilization of methane gas for vehicles in Germany. Around 22,000 vehicles were changed over to work on methane gas. Two weight containers were mounted in every side of the vehicle and every jug was holding around 1700 cft. of gas (proportional to 10 gallons of petrol). The biogas plant in Germany delivered 1.5 million cft.gas every year (proportionate to around 6600 gallons of petrol). This gas was utilized for residential warming and cooking and for working a 28 HP tractor.

Daniel (1950) 2 anticipated the interest of sunlight based vitality. He opined that sun powered vitality is unlimited and contamination free vitality. It is ideal and prepared contrasting option to household fuel which alone constitutes more than 55percent of the aggregate vitality expended in India.

Parikh's (1963)³ examination reminded the most intensive study accessible on the requests of biogas. In that study he recommended that where fertilizer was blazed, the possibilities of biogas were ideal and in this manner that inside India, Tamil Nadu, Uttar Pradesh, West Bengal and Kerala ought to create biogas programs. He contrasted biogas and wood, petrol and diesel, as the least expensive options at 1963 costs, furthermore contended that other fuel conceivable outcomes, for example, power, Kerosene and coal were excessively costly.

Rekib et al. (1968)⁶ directed a near study on points of interest of gobar gas and compost cakes. It was found that smoldering of excrement cakes brought about broad trachoma among the housewives because of unpleasant smoke. It additionally prompted wastage of manorial estimation of manure. Gobar gas, being non-noxious and a perfect fuel without smoke, expanded amount of excrement furthermore better clean conditions.

NCST (1974)⁷ set forth three noteworthy methodologies for using sun powered vitality which incorporate engrossing sun powered vitality specifically or by utilizing concentrators and after that changing over into warm vitality for required applications, changing over sun based vitality into electric force utilizing photovoltaic or thermo electric gadgets, using sun based vitality by implication. Myles (1985)³⁷ accentuated the need to advance biogas program by giving preparing and expansion offices, to

progress in conference with focal and state governments, stipends, endowments and advances straightforwardly to the general population corporate bodies like State Renewable Agencies, KVIC, KVIB, State-Agro Industries Corporations, Diary Development Corporations, Tribal Development Corporations and so on.; and to secure intentional organizations support for execution of system. Odum and Odum (1985)³⁸ pointed out that Energy is the fundamental normal asset which is key for humanity. Prakash (1986)³⁹ saw that in Kerala, the wind vitality potential is evaluated to be 3.237×10^9 KWH and is an exceedingly encouraging source. As Kerala has a tremendous beach front line and is similarly tornado free, wind vitality can be misused on an extensive scale. Jain (1986)⁴⁰ estimated the interest for non-customary vitality. His appraisals showed that at regular intervals the requests for vitality will almost twofold the present rate of utilization. Filter (1987)⁴¹ prescribed that executing organizations ought to have imperative offices available to its, for example, a little workshop to make steel parts like gasholders, classroom offices to grant essential preparing to the concerned staff, framework support for plant upkeep, sufficient space for putting away bond and steel and faculty and bookkeeping division for keeping record of regulatory and money related exercises.

C. La. Torre (1987)⁴² tested that the biogas can be utilized as fuel for boilers to create both power and high temp water. He additionally proposed that creature squanders on a ranch can be utilized as contribution as a part of biogas plant for delivering power. He depicted a huge

measured plant in Italy which produces biogas with 35000 creature squanders on a ranch with 35000 Hens and 1000 Pigs. Before maturation, waste is purged by circulated air through lagooning.

3. ENVIRONMENTAL IMPLICATIONS OF CURRENT ENERGY USE PATTERNS

The developing interest on the one side and the expanding reliance on fossil powers on the other to take care of the developing vitality demand have specialist ecological ramifications. Carbon dioxide (CO₂) discharged by copying of fossil powers is a nursery gas (GHG). There is a logical agreement that ignition of fossil fills represent around 70% of aggregate GHG discharges into the climate and this causes earth's temperature to rise (IPCC, 2007). As per exploratory evaluations, the mean worldwide surface temperature has expanded by $0.74 \pm 0.18^{\circ}\text{C}$ ($1.33 \pm 0.32^{\circ}\text{F}$) amid the most recent 100 years finishing in 2005. The Intergovernmental Panel on Climate Change (IPCC) further notes that the vast majority of the watched increment in comprehensively arrived at the midpoint of temperatures compares to a watched increment in anthropogenic GHGs (IPCC, 2007). Climatic changes driven by human exercises, specifically the creation of nursery gas discharges, straightforwardly affect the earth. The world may need to witness an assortment of negative impacts of a dangerous atmospheric deviation, including expanded human mortality, shifts in yields and farming generation, and further debasement of nearby biological systems. Expectations identifying with the impact

this environmental change would have on most areas of the world present a dreary picture.

Taking into account the present vitality utilization levels and future situations, as indicated by a late study (Mckinsey, 2009) India's emanations would reach between 5 billion to 6.5 billion tCO₂e relying upon GDP development (6 to 9 percent). The study derives yearly discharges of 5.7 billion tCO₂e by 2030 at a GDP development rate of 7.5% somewhere around 2005 and 2030. Around 50 percent of these outflows will be from force segment as 60 percent of force era would be from coal based force plants.

A protected and available supply of vitality is extremely significant for the maintainability of advanced social orders. There is an earnest requirement for a quick switch over of vitality frameworks from fossil fuel construct era to era situated in light of sources that have diminished carbon effects, for example, renewable wellsprings of vitality that are feasible, environment neighborly and can meet the present and future vitality request.

4. NEED FOR ENERGY MANAGEMENT IN INDIA

Expanding vitality request in India is a channel of the national economy. Furthermore, it is a main consideration upsetting the intensity of essential Indian enterprises in the worldwide business sector. In this way, vitality preservation is similarly critical for the country and modern firms. Electrical force is one of the rare assets in our nation. Era of power is

extremely capital escalated. 1 MW of force era costs roughly Rs. 4 crores in view of the low plant load element and high transmission misfortunes pervasive in the nation. The introduced limit of force station must be consequently, 2.2 times the electrical burden.

It has been assessed that executing end-use vitality proficiency and interest side administration measures all through India can spare almost 25,000 MW. Productive utilization of vitality and its preservation accept much more noteworthy significance in perspective of the way that one unit of vitality spared at the utilization level diminishes the requirement for new limit creation by 2 times to 2.5 times. Further, such sparing through effective utilization of vitality can be accomplished at short of what one-fifth the expense of crisp limit creation. Vitality proficiency would, in this way, essentially supplement our endeavors to meet force prerequisite, aside from diminishing fossil fuel utilization.

The financial advancement of a nation is frequently firmly connected to its utilization of vitality. In spite of the fact that India positions 6th on the planet to the extent complete vitality utilization is concerned, despite everything it needs a great deal more vitality to keep pace with its advancement destinations. India's anticipated monetary development rate is slated at 7.4 per penny amid the period 1997-2012. This would require proportionate development in the necessity of business vitality, the greater part of which is relied upon to be from fossil fills and power.

CONCLUSION

The wind energy industry is moving rapidly toward the adoption of variable speed systems for the benefits of reduced noise, increased energy capture, and for better economy. The permanent-magnet generator is a promising direct drive generator for variable speed wind energy conversion system (WECS). The progress in the permanent magnet materials fabrication has extended the PM generator lifetime and decreased the production cost. An AC/DC/AC power electronic conversion system is the most suitable type of grid interface for the above conversion system. The cheap and reliable diode rectifier is used for AC/DC power conversion. The output of the poly phase generator can be conveniently rectified to generate a high quality DC link voltage. With PM generator and diode rectifier system, the power control is set at the z-source inverter through an impedance network. The operation of the ZSI powered from a dc link with varying voltage is analyzed.

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