Renewable Sources of Energy

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ABSTRACT

Energy crisis is blowing the horn aloud on everybody's ears. Green house gas emissions are leading to global warming and degradation of the natural environment by the use of high energy materials. A lot of thermal energy is devoured during the manufacture and maintenance of these high energy materials. India has an immense potential of renewable energy sources and India stands alone on the top position among the world largest programs for renewable energy. Renewable sources like forests and fish stock's need not be depleted provided the rate of use is within limits of regeneration and natural growth. Renewable sources of energy can be classified as solar energy, Biomass energy, biogas, Wind energy, geothermal energy, Hydropower energy. Renewable sources of energy can cater to the demands of sustainable energy. Solar chimneys, solar photovoltaic's, wind towers, waste water recycling rain water harvesting, biogas, biomass gasifiers promote the vision of renewable sources of energy to a successful platform. The use of renewable sources of energy in a building promotes deduction in air pollution. The government policies alone cannot handle the situation. All the citizens of India will have to join hands and come forward as co- operation and mutual understanding for a common cause would definitely devour the present alarm struck scenario of energy consumption. The Indian Sub – continent has plenty of 'Sun' being the direct source of natural cycles on earth. The paper presents the potential of renewable sources of energy solar energy, Biomass energy, biogas, Wind energy, geothermal energy, Hydropower energy to achieve a secured future which would save humankind and the mother Earth. The consumption of energy is directly related to the economy of the nation. To secure profitable conditions in terms of monetary gains and humane existence is a necessary step ahead for a developing country like India.

Keywords: energy crisis, renewable sources of energy, solar energy, wind energy, biomass energy, economy.

1. INTRODUCTION

"Into that heaven of freedom, my father, let my country awake." – Ravindranath Tagore.

Old ways give way to new. Change is central to continuity. Buddha articulated the path of perfection, he spoke originally but his ideas were old truths. That is tradition at work. The

achievements of past generations are not there to be surpassed. They are to be built on. Buildings require energy for the maintenance/servicing of a building during its useful life and embodied energy which utilizes various building materials. The renewable sources of energy that would be of great help and act as a potential in India are wind energy and solar power. Looking at the current news scene of India the situation is not that worse.

"India's first green office building using solar power comes up in Delhi TOI 25 Feb 2014, 21:04"

Stepping in to join a global trend of adopting green technology for running office premises through harnessing renewable source of energy, the Prime Minister Manmohan Singh on Tuesday dedicated India's first 'zero net energy' building to the nation. The energy and resources institute (TERI) provides techniques which can promote savings to light 20 million rural households and result into energy efficient buildings.

Renewable power stays grounded in TN TOI 22 Jan 2014, 07:27

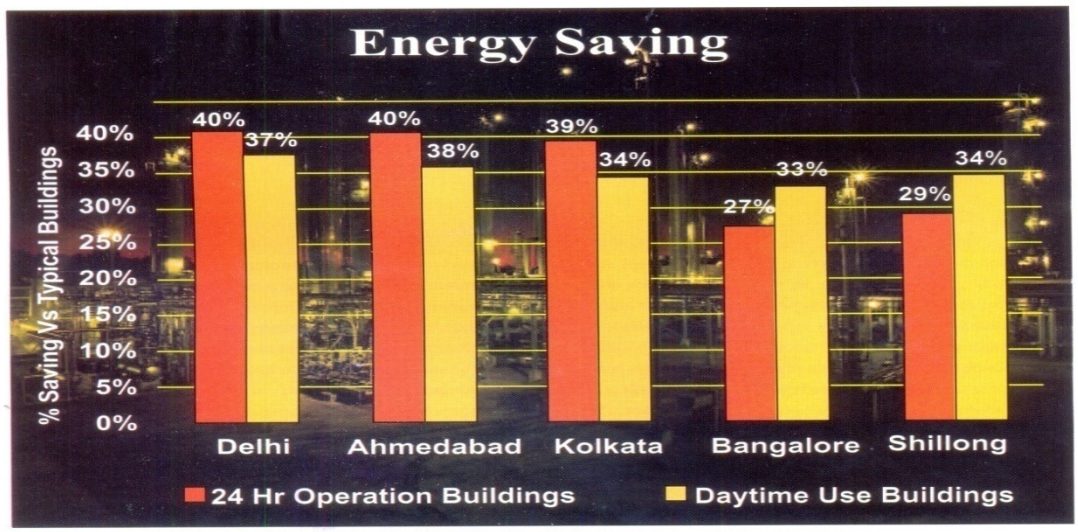
High wind power potential, high solar insolation (the solar radiation energy it receives) and shortage of power make Tamil Nadu an ideal destination for investors in the renewable power sector. The state has supported the harnessing of renewable energy, but policy, infrastructure and legal issues have hobbled the development of solar and wind power in the state. Energy from these sources could have helped the state tide through the power crisis.

India no longer lives in villages. India's urban population is second largest in the world after China. India has a massive potential to overcome energy crisis and provide POWER to satisfy all the energy needs with Renewable Energy Sources. With technological advancement reduction in the energy demand is impossible. To live in healthy environment and leave it for future generations one needs to promote renewable energy resources when India has bounteous shower of SUN.

2. POTENTIAL IN INDIA

Tremendous savings can be expected in modern high – rise urban buildings. The average energy use for typical commercial building is 200 kWh/sq. meter/year. Mandatory enforcement of Energy Conservation Building Code

(ECBC) can reduce the energy use by 30 – 40% to 120 – 160 kWh/sq. meter/year. Nationwide Mandatory enforcement of ECBE would have yielded a saving of 1.7 billion kWh for 2005-2006. (BEE)



Today hundred of megawatts of solar power projects are in the pipeline in different state. Rajasthan can be proclaimed to be the solar power house of India. The ample "SUN' in Rajasthan with 1, 01453 sq. kilometers of wasteland, at least half of which is owned by the government. Even if 5% of this wasteland is used for CSP development, 1, 77, 543 MW projects can be established; with another 5% land devoted to PV development 2, 48, 560 MW can be developed. So if 10% of the total wasteland is diverted for solar power development, a total of 4, 26, 103 MW can be developed. In the state of Gujrat the Government has announced their intention to establish 3000 MW solar power generation capacity up to 2015. They have allotted 716 MW allotted, 365 MW is PV and 351 MW is solar thermal. In the state of Punjab the first grid connected 2 MW solar project was established at Awan, 40 kms from Amritsar in July 2009. The total cost of the project is estimated to be Rs. 40 crore. In the state of Maharashtra Moser Baer commissioned its largest thin – film (amorphous silicon) solar farm with an installed capacity of 1MW at Chandrapur in Maharashtra in 2010. The project, owned by Mahagenco – a Government of Maharashtra power generation company – was awarded to Moserbear on the basis of a global bid. Mohagenco plans to install a 125 MW PV plant followed by three more plants using the same technology, with capacities between 10 MW and 25 MW. In West Bengal the first grid- connected 2 MW solar PV power plant in the country was established in Asansol by the West Bengal Green Energy Development Corporation LTD in September 2009. In the state of Karnataka, the Karnataka Power Corporation Ltd. Is establishing grid – connected solar photovoltaic power plants in three districts viz. Kolar, Raichur, and Belgaum districts (total 6 MW) have already been commissioned. In the state of Tamil Nadu no major attempt has been made for solar power generation. In the state of Haryana 22 proposals for solar power development with an aggregate capacity of 20 MW under

rooftop PV and small solar generation programme (RPSSGP) of JNNSM. In the state of Orissa according to reports, Orissa State Level Technical Committee headed by the Secretary, Science and Technology department has approved solar power projects with a capacity of 351 MW.

3. OFF THE GRID SOLUTIONS

"Off grid" or "off the grid" refers to a building or buildings that are not connected to any public utility systems. Thus, municipally supplied energy, water and waste disposal are foregone and instead are dealt with on site with renewable energy sources.

A house in a cold climate might need more energy than it makes during the winter but then makes up for it in summer when demand is lower and photovoltaic system is running at full tilt. The opposite may be true in the south, where high humidity in the summer requires more electricity for air – conditioning during peak months. But on average, of the grid houses produce enough energy to offset the high – load months.

Here's an area where because of its climate and altitude the potential for using solar and wind energy is extraordinary, yet the two resources go virtually untapped simply because of the stigma of being "green".

Off the Grid is a farm in the Western Ghats on the border of Goa and Karnataka. It is not connected to any of the supplies like electricity, water, internet or phones. The farm provides unmatched luxury without the use of above mentioned amenities. Rice is cultivated on 5 acres of land with the help of bullocks. Garden fresh salads and fruits are also part of meal along with rice. Amidst the midst of nature it is amazing.

4. RENEWABLE SOURCES OF ENERGY

India ranks sixth in the world in the world in total energy consumption. Coming to power generation in the country, India has increased installed power capacity from 1362 MW to over 112058 MW since independence and electrified more than 50, 000 villages. Sources of renewable energy in India have immense potential. This can be proved by the following studies:

Hydro Power: North eastern part of India, the states of Arunachal Pradesh, Assam, Nagaland, Manipur and Mizoram and also on the west coast between Mumbai experiences immense rainfall. Running water can be used to generate electricity, whether it is a small stream or a large river. Small or micro hydroelectricity, systems also called hydropower system also just hydro system, can produce enough electricity for lightening and electrical appliance in an average home. The estimated potential of small hydropower in India is about 15000 MW.

Wind Energy: It is one of the most safe energy resources. India has the fifth largest wind power installed capacity of 3595 MW in the world. The first wind turbines installed in India were at Okha in the province of Gujrat. Wind energy can be harnessed to provide both lighting and enough electricity to run fridges, washing machines, computers, TV's etc. and other household appliances. The estimated potential of wind energy in India is about 45000 MW.

Solar Energy: India has immense solar potential and in the south/east coast from Kolkata to Chennai, the solar energy is to its optimum. India is densely populated and has high solar insolation, an ideal combination for using solar power in India. With about 300 clear, sunny days in year, India's total solar power reception, on only its land area is about 5000 Petawatt-hours per year. The daily average solar energy incident over India varies from 4 to 7 kWh/m^2 with about 1500-2000 sunshine hours per year (depending upon location), which is far more than current total energy consumption. For example, assuming the efficiency of PV modules were as low a 10%, this would still be a thousand times greater than the domestic electricity demand projected for 2015.The estimated potential of solar power in India is about 20, 00 MW.

Biomass Energy: India is rich in biomass. Haryana is a state rich in biomass resource with the potential of generating 1400 MW of power through this source. Haryana Renewable Energy Development Agency (HAREDA) has approved four biogas – based power projects. HAREDA has set a target to minimize waste of energy consumption areas and replace energy – consuming gadgets with energy efficient solutions.

The estimated potential of Biomass energy in India is about 19500 MW.

With so massive potential the Indian government needs to come forward for the country India and provide support with private developers along with self based community manpower to bring forth India as a POWER GENERATOR for one and all.

5. CONCLUSION

The social subsystem comprises of culture, technology and institution. The natural subsystem consists of water, soil, metal, life and fire. The economic subsystem relies upon production, consumption, reduction, transport and regulation. Order, time, space, quantity, structure quantify the scientific assessment.

The perspective outlines community collaboration at all biological and functional levels, self regulation is promoted by each community (or family or neighborhood) takes or rather gets the responsibility for their own housing including their own food production and waste handling.

The renewable sources of energy act as a firm base providing complete energy solutions on a very basic scale and technological level.

The main resources to come together are local people, local building materials, local techniques and local energy.

Self regulation and awareness and respect towards the environment would not let the human race deteriorate its surroundings further. A self oath taken by all the citizens of India to contribute to the environment via simple habits: watering plants as we consume oxygen use solar power in the housing units. We need to be cautious before we start getting electricity as our gas cylinders.

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