ENVIROMENTAL SUSTAINABILITY WITH THE HELP OF SOLAR WATER HEATERS

Jyoti Meshram¹, Abhay Kulkarni²

¹Assistant Professor, Department of MBA, Jayawantrao Sawant Institute of Management & Research (JSIMR), Pune.
²Director, Department of MBA, Institute of Industrial and Computer Management & Research (IICMR), Pune.

ABSTRACT

The world energy demand is growing at a significant rate. The power generation in fact does not suffice the demand. Water heating is the second largest energy expenditure in a household behind heating and cooling. The traditional sources of energy like wood and coal used for this purpose do not only cause the pollution but also are expensive and most importantly non-renewable. The damage caused to the environment by burning of these fuels has severe impact on the environment and subsequently to the mankind. The solar power is better than electricity generated by coal or wood because it does not pollute the environment and saves a lot on costs. Installation of solar water heaters helps the individual households and the industries to save a lot on costs as well as contributing their bit to the environmental sustainability. This article focuses on the world energy needs, the alternative sources available and how various countries are putting in efforts towards the maximum use of solar energy.

KEYWORDS


INTRODUCTION

The global energy demand is predicted to increase by almost 45% during the next 20 years and the growth would be the fastest in developing and transition countries. In last 20 years, the Global Environment Facility (GEF) has invested in a varied portfolio of sustainable energy projects with a special emphasis on energy efficiency, renewable energy and transportation. These projects address many different national priorities including infrastructure, technologies, policies, best practices, institutions and capacity building. GEF renewable energy investments of US$1,298 billion with co-financing of US$755 billion have advanced demonstration and deployment of solar thermal heating, solar thermal power, photovoltaic, wind power, geothermal energy, small hydropower, biomass and combined technologies and best practices across 5 continents. These projects by GEF contributed to the direct reduction of about 1.7 billion tons of greenhouse gas emissions. There are several other tangible environmental benefits that flowed from these GEF investments.

However, there is a pervasive demand-supply imbalance that necessitates serious efforts by the government to augment energy supplies.

The country imports about 80 percent of its oil. With the threat of a further increase in oil prices, energy security of the country stands jeopardized.

India also runs the risk of lesser thermal capacity being installed. While dependence on imported coal is increasing, its domestic supply is likely to decrease in the coming years because of production and logistic constraints. All these factors have compelled the country to look for alternative sources of energy such as wind, solar, hydro and biomass. India is currently ranked fifth in the world in renewable-energy based power capacity.

Though solar energy is not the main contributor to renewable energy in India, its potential has been estimated at 50,000 MW. Increasing demand for energy initiatives by the National Solar Mission (NSM) or Jawaharlal Nehru National Solar Mission (JNNSM), various state-level efforts, renewable energy quotas (including solar energy quotas for utilities) as well as falling international technology costs have improved the market potential for solar energy.

There is an energy revolution happening in the world. There would be a time when the world would be generation the energy in radically different ways.

The solar energy industry needs a performance model that can offer investors’ confidence and predictability in their return on investment. He mentions the emergence of the power plant performance ratio, which measures the efficiency of a system in converting solar radiation into electricity.

Asia-Pacific Renewable Energy Policy Handbook 2013, Aug. 2013, report detailed promotional measures in different countries both for the overall renewable energy industry and for specific renewable energy technologies namely solar, wind, geothermal, hydro and bioenergy. The report also highlights the differences and focus of the renewable energy policy frameworks in different countries in Asia-Pacific. The report provides a platform for comparison of various renewable energy policies across countries. Major countries include Australia, China, India, Japan, South Korea, Thailand, New Zealand, Vietnam and Taiwan.
As per the report of International Business Times, Jun 2013, The National Space Society and India will now work together to form an international organization that aims to harness space solar power to meet the ever-surging energy requirements of the world.

Space solar power, which is said to be vital to a livable planet Earth, will also help mitigate climate change, Dr. A. P. J. Abdul Kalam, an eminent scientist and former Indian President and Mark Hopkins, Chairman of the Executive Committee, National Space Society said in a joint statement to the media.

"Time has arrived for us to together attempt to give a direction and momentum to this movement to realize space solar power and its enabling technologies through international collaboration that can help rebuild our environmentally vulnerable planet," the duo said in the statement.

The organization would encompass a global space knowledge platform, an international virtual library and an international advisory committee.

They announced that a clear plan of action will be charted within a year to market the idea to G8 or G20 nations. Core members of the international organization will be from nations such as the US, India, Japan and UK, who are already exploring the idea of harvesting energy from space.

In the US, Department of Energy officially introduced its Energy Star for water heaters standard. There was an International Builders Show in Las Vegas that announced the formation of the Coalition for Energy Star Water Heaters, which is designed to promote energy efficient water heaters to homebuilders and consumers.

As of January 2009, five types of water heaters are eligible to earn the Energy Star label. This program marks the beginning of the transformation of the water heater market from conventional to advanced, energy-efficient technologies.

"Water heating is the second largest energy expenditure in a household behind heating and cooling," says Richard Karney, Energy Star program manager. "The launch of the new water heater program is encouraging news for consumers, who can cut their water heating bills anywhere from 7.5% to 55% by installing a qualified model."

Once Energy Star qualified gas condensing and heat pump water heaters reach the market, additional opportunities will arise. Consumer demand for qualified water heaters will increase with the new criteria.

Solar water heaters are cost competitive in many applications when you account for the total energy costs over the life of the system. Although the initial cost of solar water heaters is higher than that of conventional water heaters, the fuel (Sunshine) is free plus they are environmental friendly. A Solar Water Heating System (SWHS) is a device that makes available the thermal energy of the incident solar radiation for use in various water heating applications. SWHS largely depends on the performance of the collector's efficiency at capturing the incident solar radiation and transferring it to the water. The water can be heated up to temperatures of 60–80°C. These systems use the Sun to heat either water or a heat-transfer fluid, such as a water-glycol antifreeze mixture, in collectors generally mounted on a roof. The heated water is then stored in a tank similar to a conventional gas or electric water tank. Some systems use an electric pump to circulate the fluid through the collectors. The hot water generated finds many end-use applications in domestic, commercial and industrial sectors. India has the highest energy intensities in Asia. Very little investment and priority are being given to increase of the efficiency. On the other hand, the India has a high potential for developing energy production from renewable energy sources solar, water, wind and biomass. However, these potentials are not studied and exploited enough and the present situation for their utilization is not so good. Obviously, defining development strategies and new support measures is necessary since renewable energy sources can make an important contribution to the regional energy supply and security.

Solar energy also has become an important issue to be researched and discussed upon as the market for solar energy is taking a boom. Research and Markets has announced the addition of the "Is Solar an Expedient Solution for Energy Security: Will Piling of Solar Projects and Policy Announcements in India Predict the Market Growth?" report to their offering. Solar Industry in India is all set to mount, citing the fact the extensive government support and private players foraying into the segment. However, despite the initiatives being taken in the segment, the sector needs to deal with lot of constraint that are impeding the performance of the sector. Better financing, more space to private players in terms of land acquisition and enhancement in financial terms are the need of the hour while new development opportunities are dwindling around.

Industry is also keen about using solar energy to suffice their energy needs. Sen, Sunny, (May 2011) in an article "seeking succour from the Sun" discusses the move of the optical disc manufacturer, Moser Baer India Ltd., to heavily invest in solar energy in India. It outlines the financial challenges of the company due to the fall of its sales, resulting to registered losses for three years in succession.

The solar power is better than electricity generated by coal or natural gas, because it does not pollute the environment, saves security costs and the construction of big and expensive power stations. Solar energy ventures and environmental organizations claim that electricity generated by gas and coal is far more expensive than the end price when all the costs and damage to the economy from the production and supply are factored in.

Ongoing consensus on the move towards "going green" or adopting "green" practices, particularly among electric energy consumers has been hailed in various quarters as a positive trend towards the much needed efforts at reducing our carbon footprints from decades of unregulated carbon emissions. This evolving behavioral shift is receptiveness to adopting "green" electric energy has been lauded by many, particularly among politicians and some in the scientific community. The trend has been well received by environmentalists who continue to espouse the growing notion that humanity’s inordinate carbon emissions are mainly responsible for adverse global climatic conditions and extreme weather patterns currently impacting negatively on both humans and plant life. Data from the National Renewable Energy Laboratory (Affiliate of US Department of Energy) shows that this evolving trend ("Going green") which has become a novel hallmark to strive for among most households as well as commercial and industrial entities continue to make slow, but steady progress in attracting the average consumer’s attention towards the need to "Go green."

Germany has been the world leader in solar energy since the early 2000s. In reality, Germany accounts for nearly 70 percent of the world market for solar panels as well as the equipment required to make them and it is just over a decade that began in the early 2000s, the country has created thousands of production jobs and hundreds more in R and D and through an incentive program encouraged scores of businesses and households to mount solar panels on their rooftops. Today, the country has as much installed solar power generation capacity as the rest of the world combined, generating nearly 6 percent of its annual electricity needs from the sun alone.

BIBLIOGRAPHY