

Attain Sustainable Future By Harnessing The Solar Energy

Vignesh .M

MBA, Department of Management Studies
Bharath Institute of Science and Technology
Selaipur, Chennai, Tamil Nadu 600 073
Bharath Institute of Higher Education and Research

ABSTRACT

We, the people of Earth, are so much scientifically advanced that we have reached the Mars and invented nano particles with which the size of all the equipment and gadgets are getting smaller and smaller but yet we are unable to save our own Mother Earth. Pollution is in its peak, greenhouse effect is increasing day by day, climatic change is on rise and fossil fuel is depleting at a fast rate. Fossil fuels are non-renewable and create more pollution to the environment. But we have tremendous amount of renewable fuel which while using do not pollute the environment. These renewable fuels are hydro energy, solar energy and wind energy. With the increase in population, there is also an increase in the consumption of non-renewable fuels like fossil fuels due to which India's dependence on imported fuels is increasing. This is the high time where MNRE should give special attention in the development of solar heat applications in all sectors. MNRE and the State Government should invest more in the R&D, increase the awareness, give more subsidies and encourage the people for the adoption of solar energy. Solar energy is the most efficient form of energy which not only the alternative source but also helps in reduce the emission of greenhouse gases and helps to reduce global warming. India receives solar energy equivalent to over 5000 trillion kWh per year with about 300 clear sunny days in a year and most of it remains unused for human well-being. Many nations have understood the problem and to amplify the use solar energy in their country they are providing a broad range of financial, promotion, subsidies and other instruments. In this paper we discuss the strategies to tap the large amount of solar energy which we get naturally but remain unused.

KEYWORDS – Sustainable future, Pollution, Fossil fuel, Renewable energies, Solar energy.

1. INTRODUCTION

We, the people of Earth, are so much scientifically advanced that we have reached the Mars and invented nano particles with which the size of all the equipment and gadgets are getting smaller and smaller but yet we are unable to save our own Mother Earth. Pollution is in its peak, greenhouse effect is increasing day by day, climatic change is on rise and fossil fuel is depleting at a fast rate. All these are not isolated events; if you connect the dots you can see a bigger picture. Smoke coming while using the fossil fuel like petrol, diesel, oil etc. is generating pollution as the pollution is increasing greenhouse effect is happening and as the greenhouse effect is happening climate is changing dramatically, the temperature of our planet is rising, snow are melting, level of sea water is rising since snow is melting the ocean due to which cities near the sea shore are in danger. We can call it as Dominos effect as one domino falls all the dominos go on falling till the end. Mankind is the last domino and if we want to save the last domino from falling then we have to stop the first domino and the first domino is the fossil fuel. Fossil fuels are non-renewable and create more pollution to the environment. But we have tremendous amount of renewable fuel which while using do not pollute the environment. These renewable fuels are hydro energy, solar energy and wind energy. In this paper we will specifically discuss the solar energy. Sun rays are directly converted into heat; no mechanical or

electrical conversion is required. In India we have a strategic advantage, where sunshine is available for longer hours per day and in great intensity. Solar thermal applications are economically viable and can be used for water heating, drying and cooking. Solar water heating is well established, matured technology; its applications are used in many sectors; residential, hotels, hospitals, industry and others like railway, defence, hostel, religious places. India is a developing country with very high industrialization, substantial economic growth and a promising GDP. With population growing exponentially every year India is under immense pressure to develop and encourage the use of renewable energy like solar energy. With the increase in population, there is also an increase in the consumption of non-renewable fuels like fossil fuels due to which India's dependence on imported fuels is increasing. This is the high time where MNRE should give special attention in the development of solar heat applications in all sectors. MNRE and the State Government should invest more in the R&D, increase the awareness, give more subsidies and encourage the people for the adoption of solar energy. Now it has become very important to curtail the increasing import for increasing our competitiveness in international market and raising living standard of peoples. By increasing the use of solar energy we are not reducing the import but we are also reducing the harmful emissions.

SUSTAINABLE DEVELOPMENT

By sustainable development we understand that the development which does not compromise the future generation needs to meet the current needs. So, for securing the future, for coming generations from climate change, global warming other pollution threats sustainable energies is gaining importance. Sustainable energy is the kind of energy that comes from renewable sources and they are clean and they emit very less polluting gases i.e. solar energy, wind energy, biomass energy, geothermal energy, etc. and are also often called alternative sources of energy. Among the above mentioned alternative sources of energy, solar energy is the most efficient form of energy which not only the alternative source but also helps in reduce the emission of greenhouse gases and helps to reduce global warming. India receives solar energy equivalent to over 5000 trillion kWh per year with about 300 clear sunny days in a year and most of it remains unused for human well-being. India has a strategic advantage due to its geographic location. India is located in the tropical belt where we have a high potential for the solar energy. So the solar energy being the most efficient alternative source of energy is the way for the sustainable development for future for India. In India, especially the rural Indian households are dependent on insufficient and poor quality energy sources. Energy sector has great role in improving the quality of life. At the same time solar energy will have great contribution not only in improving the quality of life but also in sustainable future of our country.

Most of the power distribution companies in India are unable to meet their renewable purchase obligations due to high transmission and distribution losses. So, transfer of renewable purchase obligations to large power consumers which already pay high power tariffs and are close to grid-parity is one option for those states. Another key driver in the Indian solar market is to increase the demand for solar from these power consumers. The removals of barriers are ongoing, and it provides strong support in expansion of the solar market.

Many solar energy technologies are not yet cost-competitive with conventional energy supplies. Without major policy incentives significant development in solar energy is very difficult. Many nations have understood the problem and to amplify the use solar energy in their country they are providing a broad range of financial, promotion, subsidies and other instruments. Various

policies are designed to promote renewable energy, including solar, at the global level as well as for a particular country, such as India. These policies are helping in the promotion of solar energy in the developed and developing countries.

ENERGY IN INDIA

- India is at high pace of development and is at the early stage of economic transformation. The whole world is turning around towards the development of India. India is gaining centre stage in the international affairs. As we prioritize to develop India's manufacturing base for "Make In India" concept, the energy sector too is expanding exponentially. The energy sector has to face lot of challenges due to the pollution and also it has to consider the alternate source of energy.
- As per the data, the usage of energy has been doubled since 2000. Millions of people have been lifted from poverty and the consumption of energy has been increased with the help of economic growth and Government's development policies but still there are millions of people who do not have any access to electricity. There comes a tremendous opportunity for the growth of the solar energy. We can also expect to increase in the consumption of energy in the coming years.
- To satisfy our energy demand we largely depend on the fossil fuels almost three-quarters of Indian energy demand is met by fossil fuels. 70% of power generation in Indian power sector is dependent on the coal. Dependence on coal imports has grown in recent years. India was the world's third-largest importer of crude oil in 2014, but is also a major exporter of oil products, thanks to a large refining sector.
- As we want to develop the rural India and as our population is increasing the demand in energy sector is increasing. Power generation capacity has been increased in the recent years still the sector is not looking promising because of its perilous financial situation of local distribution companies and large losses in the transmission and distribution networks India has 45 GW of hydropower and 23 GW of wind power capacity, but has barely tapped its huge potential for renewable energy. India is, however, aiming high in this area, with a target to reach 175 GW of installed renewables capacity by 2022 (excluding large hydropower), which is a steep increase from today's level of 37 GW. Solar power is a key element of the government's expansion plans.
- In India, whether it is Central Government or the State Government, they are making strenuous efforts to eliminate the hurdles in the way to investment in energy supply and also they are trying to make policies which will encourage the people to use the alternate sources of energy like solar energy which is in abundant in the place like India. Policy and investment decisions are much influenced by the sensitivity of land and water use, end-user tariffs and affordability, as well as the worsening air quality in many of India's major cities.

EVOLUTION OF SOLAR ENERGY

THE GLOBAL SOLAR POWER MOVEMENT

The 21st century has witnessed to many changes and development all around the world especially in the field of solar power industry. If we analyse global cumulative solar power installations from 2000 onwards we come to an understanding that only 1.3 GW was the total global installed solar capacity in year 2000. World has seen the turning point in the solar power industry in the year 2008-09, when solar power industry's demand for polysilicon picked up

and raced ahead of the electronics industry. In 2014, the solar power installations have increased up to 40 GW that accounts for 109.6 MW of capacity addition each day against only 3.5 MW in 2000 each day.

THE INDIAN PATH OF SOLAR POWER

India has substantially paved an upward path in terms of solar power capacity achievement since 2008. It started off with 3 MW in 2008-09 and has touched 8000 MW (8GW) by July end, 2016. India has set a target of 100 GW by 2022, which is divided as: 60GW of land mounted grid connected solar power and 40GW of rooftop grid interactive solar power. This has been further divided into the following yearly targets from FY 2015-16 to FY 2021-22 (Table1):

Table 1: Grid Connected Targets for Solar Power Installations

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MW	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Rooftop Solar	200	4800	5000	6000	7000	8000	9000	40000
Ground Mounted Solar	1800	7200	10000	10000	10000	9500	8500	57000
Total	2000	12000	15000	16000	17000	17500	17500	97000

Source: Ministry of New and Renewable Energy (MNRE)¹, (2015)

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India has become an active player in solar power industry from 2008 onwards and from 2010-11 one can see an exponential development in the India's solar power journey. Till the FY 2016 India have reached a cumulative of 6763 MW but our Prime Minister Modi has set an ambitious target of installing 100 GW (100,000 MW) of solar power capacity by 2022. The current solar capacity in India stands at 8 GW as on July end, 2016. Thus, the target of moving from 8 GW in July 2016 to 100 GW by 2022 is one of the most ambitious targets globally. And for the year 2016-17 there is a target set for the capacity creation of 12000 MW which is going to be most difficult as it would be an exponential jump in the pace of installations. Therefore the future for India is both challenging at the same time promising. It will be a very big challenge to widespread the solar energy installation at the same time we have plenty of potential. We can make use of farmer's field, we can install the solar panels in the fields and it will also help to boost the farmer's income. This is an innovation that India needs to explore at a large scale to emerge as a global leader in generating clean energy in a cost competitive and inclusive manner.

STRATEGIES

We need more strategies to attract the customers and increase the market demand

- Develop value for the customer – Marketer understand it very clearly that customer will buy a product only when it satisfies his need no matter how environmental friendly the product is. Therefore, the marketer must increase the value proposition to the customer.

- Today is the era of meta market – Now a day customer do not buy only a product, they buy a package. May be customers have time constraint or may be it is a marketing strategy to attract more customers by the marketer. Today customers expect the marketer to develop alliances with all the other service provider or product seller and sell it to the customer as one package rather than customer going to each group and buying it separately.
- Develop a common message - Marketer must develop a common message for the customers.
- Coalition with industry – Marketer must form coalition with industry to strategize to attract more customers.
- Marketer must strengthen the industry's trade association.
- Marketer must invest in the R&D to find the ways to lower the product price.
- An efficient distribution channel can attract and retain many customers. Marketer must invest in improving the distribution infrastructure.
- Marketer must develop alliances with other alternate energy service companies like hydro power and wind power etc.
- Marketer must target the end users with appropriate messages.
- Marketers must strictly avoid to use technical jargons in their advertising.

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