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A TAKE ON SOLAR POWER IN INDIA

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Rising focus on the increasing awareness of existing solar systems, ambitious plans announced on the amount of solar power generation for the next few years, cancellation of subsidies over a considerable period and their reintroduction, and of course, the hot off the fire 'solar scam' are some of the issues at the forefront of green energy in India. The country's potential to go green with this sustainable form of energy, and its low adoption rates, have since always remained a topic of concern.

India is a fast growing economy, but power scarcity and diminishing sources of coal and other domestic gases are taking over the country. The rapidly emerging manufacturing sector and increasing energy demand at the domestic front have turned India's attention towards sustainable energy forms like never before. The country's economic growth, its rapid urbanization, and the gradual increase in its per capita consumption are all expected to sizably increase India's overall demand for electricity. Indian government has announced that it will achieve the 100GW solar power target by year 2022. With 8.1 GW, India's installed solar capacity has experienced an 80% growth since September 2015 (ETEnergyworld, 2016). Conversion of radiations from the sun into electrical energy mostly using photovoltaic cells results in solar power. Geographically, India is a very fitting choice for solar power generation. India is a tropical country and much of it is conveniently located near the equator. It has ideal conditions for harnessing solar power, with it receiving almost 300 days of sunshine a year (this approximates to about 5000 trillion kilowatt of power). Regarded as the alpha of all energy forms, solar energy can be used in two basic ways – one being the thermal form for drying, heating, cooking, and the other being the photovoltaic form, whereby solar energy is converted to electricity usable for lighting, pumping, and so on. It is pollution free, comes with a virtually inexhaustible supply, and has a global spread; all of these make solar a hugely attractive form of energy in these times of global warming (EAI, 2013).

In The Future

Increased interest is now being invested in the solar side of power generation, and India is joining the solar league with numerous solar power projects, many of which have already been commissioned. The Indian government has introduced various schemes and policies to rightfully utilize the enormous amount of solar energy available within the country. In September 2013, Government of India announced plans for building an ultra-mega 4

Giga Watts solar power plant in Rajasthan. This project is being called the world's first of this scale, which is expected to become a trendsetter in large-scale solar power projects. Rajasthan is the acclaimed hub for most solar power plant projects in India. Gujarat is another state with the highest potential for solar power generation, with sufficient availability of land for setting up solar power plants. A New York Times report by David Ferris highlights that India's solar ambitions have massively grown over the recent years. It is also forecasted that the Indian solar market could be worthy of billions of dollars over the next few years, tentatively over the next ten years. The emphasis will have to be largely based upon the execution, financing, and localization of all undertaken solar projects. Contrastingly, the local players in this case, are expected to dominate the downstream solar industry in the initial years (Ferris, 2013). An October 2013 Bloomberg news report states that with this ultra-mega solar power plant plan, India is aiming to sell power at a record low rate. Recently, solar tariffs for large projects were recorded at as low as Rupees 4.34 per unit (Nandi, 2016).

Millions of Indians survive on off-grid solar home systems; average sales for these devices have increased by 47%, annually, from 2012 to 2016, supplying energy for over 90,000 homes (Clover, 2016). In promoting their solar components, Tata power estimates that remote sections of the country suffering from poor or no electricity may show the highest adoption rates for solar power. The urban parts are also expected to have high adoption rates, owing to power cuts, especially during summers. The Maharashtra government has also authorized a 150 megawatts power project, the largest photovoltaic project in India. They are also bringing in four solar power parks in the state to meet the state's power requirements, with aids from public-private partnership scheme and the Asian development bank.

Acclaimed Advantages

In a seminar organized by the Ministry of New and Renewable Energy (MNRE), solar experts put forth that the higher adoption of solar power in India will not only reduce its dependency on fossil fuels, but will also assist in lowering energy costs and increasing business and job opportunities within the country. They recognized the significant reduction in greenhouse gas emissions as the greatest advantage of increased solar power adoption in India (Deccan, 2013). In terms of its other advantages, solar power offers substantial returns on investment; it is highly environment friendly, potentially non polluting, involves no noise and has a zero carbon footprint; it also eventually becomes free after the initial capital investment; it is long lasting, in that, it comes with a long life of almost 20-25 years; given that the solar panels have no moving parts, and require no fuelling or replacement of parts (as there is virtually no wearing out), these systems require minimal to no maintenance; again, since the source for harnessing this form of energy is solely the sun, there is no typical need for gaining access to the source, like in other cases of digging up coal, gases and oils.

Challenges

The last few months of 2013 saw several media reports claiming the cancellation of subsidies for solar installations as the major cause behind its retarded adoption in India. A handful of articles (Hindustan Times, 2013; India Solar Market, 2013) reported that

numerous solar power companies are blaming the government for not releasing the promised subsidies, and that lack of subsidies is having a direct negative impact on solar power adoption in India. A July 2013 Times of India report lists multiple cases where the Tamil Nadu government failed to comply with declarations made on solar subsidies – for instance, after subsidies were announced, there was no communication on how these subsidies would reach the masses (Sushma, 2013). Owing to increased power cuts, residents are willing to use rooftop solar systems, but the unclear central and state subsidy issues stand in the way of solar adoption within the country. This is not only having an impact on household solar adoption, but has also been reported of having a negative impact on commercial and industrial solar adoption. Subsidies were introduced to motivate solar power adoption, but these subsidies are acting otherwise and snagging the entire adoption process. However, as of Feb 2016, the Indian government has restarted its 30% subsidy on the capital cost of installing a plant. This incentive excludes commercial projects, and offers generation based incentives only to household/charitable projects including the 30% subsidy from MNRE (Nandi, 2016).

Awareness amongst consumers is also recognized as a challenge in this context. When it comes to solar systems and their diffusion, consumer perceptions have received considerable attention from the critics and argued to be affected by various factors (Kapoor et al., 2014). In addition to the convoluted subsidy programs and poorly managed financing options, there are a number of other challenges associated with the regulation of solar power in India. To broadly list a few, there is the paucity of land, which is typically unavailability of per capita land for solar installations; high installation costs; lack of trained personnel to manage and drive the solar industry; and of course, the need to rightly educate consumers on the economics associated with the usage of solar power (EAI, 2013). Industry experts have particularly pointed at the need for rectifying the big misconception that people have, which is, solar power is very expensive (Panchabuta, 2013).

Studies like Ansari et al. (2013) identify – higher net payback period of power plant installations, lower efficiency in terms of not all absorbed solar radiations by the photovoltaic cells are converted into electricity, requirement of backup power devices during limited or no sunlight days, lack of favorable financing options, absence of an adequate market for green electricity, insufficient political involvement and support, inadequate government policies, and no substantial research and development in this field, as the other barriers to solar power plant installations in India

Government Policies and Aids

Some of the government bodies actively promoting and supporting solar power projects in India are the MNRE, the Solar Energy Centre (SEC), the India Renewable Energy Development Agency (IREDA), and others. As future aids to boost the country's solar power adoption, the government is introducing new schemes and plans, a few of which have been documented here – as of Feb 2016, the Delhi government has announced a generation-based incentive (GBI); according to this incentive, the government will pay Rupees 2 per unit of solar energy produced for household consumers and charitable organizations (Nandi, 2016). This incentive has been released for a two-year period as of now, and is expected to accelerate adoption of solar systems amongst domestic users; The

Himachal Pradesh government has also geared up to introduce 70% subsidy for people installing solar photovoltaic lights (TNN, 2016); The state government in Odisha is targeting to generate 70MW of solar power by the year 2022. This includes installing rooftop panels for about 15 towns within the state (Behera, 2016). Also, the cabinet has issued clearance for viability gap funding for 5000MW solar power projects, which will be issued in terms of partial payment from the government for setting up solar panels, mostly in the private sector, on a build-own-and-operate basis, with an aim of adding on to grid power being generated in the country (Jai, 2016).

In the News

India brought into effect the import ban on solar equipment, whereby the government of India mandated the use of India-made photovoltaic cells and modules for all solar projects being undertaken within the country. Reports suggest that in retaliation to this move by the Indian government, the United States have filed a claim with the World Trade Organization against India, calling this move 'discriminatory', whereby they state that India's domestic rules have violated the trade rules of general agreement on trade and tariffs. With this claim, the US has effectively challenged India's usage of subsidies and the domestic buy rules of their solar programs.

To add to the glory is the Kerala solar scam. The scam revolves around a fraudulent solar power company that operated from Kerala. The accused company had reportedly guised itself well to blend within the solar industry by awarding several recognized people with the 'virgin earth golden feather environment award' to gain credibility. Crores of rupees were reportedly swindled in this scam, which came at an added price of retarding the photovoltaic business in the state. Potential customers were found delaying their solar installations after this scam causing incalculable damage to the solar energy sector within the state (Basheer, 2013). Malpractices and negligence in the marketing process, bad or poor quality components, and increased cost associations with solar panels, were identified as other factors considerably hindering the overall growth of the solar industry.

In Summary

Presently, whilst some parts of India are suffering from acute electricity shortage, the others are considerably affected by existing power shortage. What is needed now is substantial addition in terms of country's power capacity to fulfill the energy requirements of this rapidly growing economy. Harnessing the endemic solar energy can effectively assist in raising the country's energy security by branching out and expanding the supply, minimizing the import dependence, and alleviating the volatile fuel prices. In addition to rural parts of India being benefited from electricity, solar power generation also helps in propelling economic development of these underdeveloped rural areas. Apart from fuelling industrial development on the domestic front, the ultra-mega solar power project is expected to soon hold a major share of electricity in India, and also worldwide.

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