

India's Path Towards Solar Power Development: A Detailed Analysis

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ABSTRACT

Climate change has substantially impacted the lives and ecosystem of the world. One of the causes for this accelerated change in climatic conditions has to be attributed largely to the pollution caused by the burning of carbon. The need for a cleaner fuel or a cleaner alternative is at its peak. Thus, renewable sources of producing energy were tipped to be the next big thing to cut down carbon utilization and thereby having a substantial impact. The paper tries to highlight how renewable sources of energy such as solar, wind, hydro, etc. are being adopted by nations as a substitute to carbon and to meet their increasing power requirements. We try to highlight the changes taking place in the arena of solar power and how India is making rapid progress with the development of solar energy by establishing significant infrastructure and setting healthy targets to ensure it meets its energy requirement and become a global leader in this arena. We also highlight the economic factors associated with solar power generation in India and the problems faced by the growth of the Industry. Lastly, an important barrier in the form of Covid-19 which has impacted these solar power projects has also been discussed looking at its medium and long term impact on the industry.

Keywords: Solar Power, PSUs, Renewable Energy

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Introduction

The topic of climate change has been a hot area of discussion in the global community in the last few decades. The environmental conditions have deteriorated globally and the biggest contributor to this damage has been the greenhouse gases, specifically carbon dioxide which has resulted in the average temperature of the globe rising significantly. To combat this deterioration, many countries are trying to put a limit on the emission of these greenhouse gases.

However, the important question is how to implement a safe and efficient way of reducing these emissions? The answer lies in finding alternative sources of sustainable energy and cutting on the usage of carbon and its products. Production of energy, for the power sector, has been one of the major causes for the generation of carbon waste in the atmosphere.

In the past few decades, several viable alternatives in the form of renewable resources have come up and they have been implemented. One such source is Solar Energy which has gained popularity across various countries. The production of solar energy takes place through *Solar Photovoltaic (SPV) technique or Concentrated Solar Power (CSP)*. Since the power crunch is a global issue, the Indian government is trying to make its contribution to the same as well. One such initiative is the *Jawaharlal Nehru National Solar Mission (JNNSM)*.

The Government of India along with the PSUs has played an important role in the development of renewable energy in India. The legislations implemented by the Government ensure that renewable sources of energy are promoted in India and the beneficiaries are not just limited to the urban and semi-urban areas but it is also benefitting the rural areas in India. The PSUs in India have committed heavily to the development of solar power generation and key partnership with the private sector in the coming years can benefit the whole process and ensure speedy implementation.

The economics of such investment in solar power is also viable as it helps boost India's economy and also puts India in a position of being a global leader in this sector. However, there are some limitations and challenges that the project faces and it is upon the Government to play a major role in ensuring that these challenges can be dismissed at the earliest. The biggest challenge that the power sector is facing is from the unprecedented impact of the global pandemic leaving a certain medium and long term impact on the project have also been discussed.

Solar Power Scenario in India

India at a national level understands the importance of energy and its production. Having said this, it does not mean that importance is not given to the economy and ecology. Its renewable energy sector is the fourth most attractive renewable energy market in the world.¹ It has come to realize that the production of energy through renewable sources of energy such as solar power is efficient, ecological and economical in the long run.

¹ EY, https://www.ey.com/en_gl/recai (last visited Apr. 28, 2021).

The Ministry of New and Renewable Energy, under the supervision of the Government of India, has outlined an action plan to achieve a total capacity of 60 GW from hydropower and 227 GW from other Renewable Energy Sources by March 2022; this includes 114 GW from solar power, 67 GW from wind power, 10 GW from biomass power and 5 GW from small hydropower. The Government plans to establish a renewable energy capacity of 500 GW by 2030. This is proving to be the major thrust for the sector as the market players have enough incentives to move towards a cleaner source. The Government is aiming to achieve 225 GW of renewable energy capacity by 2022, much ahead of its target of 175 GW as per the Paris Agreement. Under Union Budget 2019-20, the Government allocated Rs. 4,272.16 crores (USD 611.26 million) for grid-interactive renewable energy schemes and projects, and Rs. 3,004.90 crores (USD 416.48 million) for the development of solar power projects, including grid-interactive, off-grid and decentralised categories. A total of 42 solar parks were approved to come up by May 2019.²

The process of solar power generation can be difficult due to the requirement of space, research & development in the field. However, the geographical location of India gives an added advantage in receiving enough solar insolation to convert to solar power. The State of Rajasthan in India has a huge geographical advantage and as many as 722 reputed companies have already registered interest in setting up solar power plants.³ India has been building a solar power plant in Rajasthan since 2019, which will be the world's largest with a capacity of 2,255 MW. India plans to add 30 GW of renewable energy capacity along the deserts on its western border of Gujarat and Rajasthan.⁴ One of the key policies of the Indian Government to promote solar power is the JNNSM and according to this project around 1800 MW of grid-associated Solar Tower plant could be installed by the year 2022.⁵

Government's Legislative Role in Solar Power Development

The promotion of renewable energy is an important step in making renewable energy the “new normal source of energy”. The best way of achieving the goal of making renewable energy a more efficient source of energy is through promoting the several initiatives and legislations instituted by the Government of India. The Electricity Act 2003, National Electricity Policy 2005, National Rural Electrification Policy 2006, National Tariff Policy 2006, Jawaharlal Nehru National Solar Mission (JNNSM) etc. were passed with the purpose of promoting and recognizing the importance of renewable energy sources.

The regulation of the Electricity Act 2003 mandates the promotion of renewable energy sources and recognizes trading, co-generation as a separate activity and it has guided in a competitive generation in the Indian power sector.⁶ It gives the Central Government the power to develop a national policy for optimal utilization of resources including

² IBEF, <https://www.ibef.org/industry/renewable-energy-presentation> (last visited Apr. 28, 2021).

³ S. Pandey, V.K. Singh, N.P. Gangwar, M.M. Vijayvergia, C. Prakash, D.N. Pandey, *Determinants of success for promoting solar energy in Rajasthan, India*, 16 ELSEVIER 3593, 3593-3598 (2012), <https://www.sciencedirect.com/science/article/abs/pii/S1364032112001955>.

⁴ *Supra* note 2.

⁵ Gopalakrishnan Srilakshmi, Venkatesh N.C, Thirumalai Suresh N.S., *Challenges and opportunities for Solar Tower technology in India*, 45 RENEW SUSTAIN ENERGY REV, 698–709 (2015).

⁶ A. Singh, *Towards a competitive market for electricity and consumer choice in the Indian power sector*, 38 ENERGY POLICY, 4196-4208 (2010).

Renewable Energy.⁷ Section 82 of the Act⁸, empowers the state to establish a State Electricity Regulatory Commissions (SERC) where these commissions are given the power to promote and find the more efficient method of generation and cogeneration of power and electricity⁹. The commissions also make the decisions regarding the tariffs and distribution of licenses.¹⁰

When it comes to efficiently using renewable sources for power generation and usage of the same, there has to be a plan for the distribution of the energy as well. Therefore, National Electricity Policy (NEP) 2005 came up with the plan in conversation with the companies. Basically, by communicating with the companies there is just a better method of energy supply and power distribution. This particular policy has allowed the entry of private players in the field of renewable energy. This policy undergoes changes as and when deemed fit by the Central Government. The NEP came up in compliance with Section 3 of the Electricity Act 2003. The policies are framed after discussing with the Central Electricity Authority.

The National Tariff Policy was announced in 2006 and it has played a significant role in promoting renewable energy sources followed by Section 86(1)(e) of the Electricity Act, 2003. It instructs each State Electricity Regulatory Commission to determine Renewable Energy Purchase Obligations by distribution licensees within a period of time.

The National Rural Electrification Policies 2006 permitted stand-alone systems using renewable energy sources. It is targeted to supply electricity to all households, supplying reliable and quality power at reasonable rates. In villages where grid connectivity was not possible, the off-grid solution with stand-alone renewable systems may be used for electricity supply.¹¹ The Indian government also launched the “*Deendayal Upadhyaya Gram Jyoti Yojana*” for rural electrification”. The move aimed to make sure that all the rural areas also have access to electricity.¹²

The State Electricity Boards and corresponding agencies or organizations play a leading role in the execution of renewable energy at the state-level. Various state-level policies that are different and independent from several national-level policies are also promoting solar power as a renewable energy source.¹³

Role of PSUs in Solar Power Development

India is aiming really high when it comes to replacing the traditional energy sources with new and renewable energy sources. It is the third-largest producer and second-largest consumer of electricity in the world. Its electricity requirements are met by

⁷ Electricity Act, 2003, § 3, No. 32, Acts of Parliament, 2003 (India).

⁸ *Ibid.*

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ N.K. Sharma, P.K. Tiwari, Y.R. Sood, *A comprehensive analysis of strategies, policies and development of hydro-power in India: special emphasis on small hydro power*, 18 RENEW SUSTAIN ENERGY REV, 460-470 (2013).

¹² POLICERESULTS, <https://www.policeresults.com/deen-dayal-upadhyaya-gram-jyoti-yojana-ddugjy/> (last visited Apr. 29, 2021).

¹³ N.K. Sharma, P.K. Tiwari, Y.R. Sood, *Solar Energy in India: strategies, policies, perspectives and future potential*, 16(1) RENEW SUSTAIN ENERGY REV, 933-941 (2012).

conventional power generation sources such as coal, lignite, natural gas, oil, hydro and nuclear power to the viable non-conventional sources such as wind, solar, agriculture and domestic waste.¹⁴ As of 31st March 2021, it has an installed power capacity of 382.151 GW.¹⁵ This capacity further increases in peak seasons thus making the transition towards renewable energy even more challenging.

Thus, to achieve a smooth transition, the role of the Public-Sector Undertakings (PSUs) has become very crucial and fittingly, some of the biggest PSUs in India have dived right in to ease India's transition process. PSUs such as the National Thermal Power Corporation (NTPC) plans to have a minimum capacity of 30 GW from solar power by 2032. Another PSU known as National Hydroelectric Power Corporation (NHCP) has some of the most ambitious plans for floating solar plants aiming for a 1 GW plus target in states including Odisha and Telangana. The Neyveli Lignite Corporation Limited (NLC) which is another major PSU that already has a capacity of 1.37 GW from solar power has commissioned a 440 MW SPV power plant Neyveli which will result in an overall power generation capacity of 3.73 GW.¹⁶

Other PSUs include the Social Energy Corporation of India (SECI), aimed at the promotion of solar power in India on a large scale. Of late, the SECI has been mainly involved in the implementation of JNNSM. The SECI is the body that is central to the operation and management of solar power rooftop grids. The promotion of solar power in rural areas is also an important task that is carried out by the SECI. The vision of SECI as an organization is that of a "*Green India*" through tapping solar radiation and executing energy security for India.¹⁷

Institutions such as Indian Renewable Energy Development Agency (IREDA) were set up to promote and develop financial support for new energy conservation projects. By financing renewable energy, the IREDA aims to make an expansion of the market share of renewable energy. They also provide continuous customer services for the improvement of the facilities and processes. The National Institute of Solar Energy, another organization under the MNRE plays an important role in testing new facilities and researching and developing new techniques for solar power generation.

Economics of Solar Power Development in India

Amidst the major environmental debates that have sparked across the world, it is now understood and a well-known fact that environment and electricity generation will have to go hand in hand. The traditionally used sources of electricity such as fossil fuels are no longer commercially viable and at the same time have irreversible consequences on the environment.

By capitalizing on renewable energy sources, India has come to realize that it is cheaper to build solar power farms than to build more coal-based power plants. Since 2010 there have been various contributions in the field of solar power generation and attempts have been made to maximize the outputs. In 2010, the total installed solar

¹⁴ Neha Sharma, *The top 5 PSUs with Big Solar Plans for India*, Saur Energy Intl. (Apr.30, 2021, 10:15 PM), <https://www.saurenergy.com/solar-energy-blog/the-top-5-psus-with-big-solar-plans-for-india>.

¹⁵ NATIONAL POWER PORTAL, <https://npp.gov.in/publishedReports> (last visited May 10, 2021).

¹⁶ *Supra* note 14.

¹⁷ PSU CONNECT, <https://www.psuconnect.in/company/solar-energy-corporation-of-india/69> (last visited Apr. 28, 2021).

capacity was 10 MW and in 2016, the installed capacity stood at 6000 MW - a steep climb of 600 times in just 6 years.¹⁸ The government has set the target that by 2022 the power production through renewable energy will be 38% thereby increasing up to 100 GW. Since the government has seen the potential that renewable energy has, it made significant investments in the same direction and India has managed to reach the economies of scale very quickly and therefore become one of the cheapest producers of solar energy.

We need to also understand the fact that several technologies that are central to the production of energy through renewable sources, more importantly, solar energy, are still imported from various countries. For the past three financial years FY17, FY18, and FY19 the total value of the country's solar imports were USD 3,196.5 million, USD 3,837.6 million, and USD 2,159.7 million, respectively.¹⁹ Thus, somewhere the production of energy through renewable sources results in huge costs for the projects. In the recent turn of events, the fact that investing in solar power in India is now very cheap since investments are welcomed. As a result, India is standing on the brink of a renewable energy revolution.

Contributing to the above-mentioned point, it is important to focus on the fact that recent investments and economic boosts under the *Atma Nirbhar Bharat* model have resulted in the internalization of several technologies involved in solar power generation. In fact, in 2020, 100 GGW was obtained through solar energy.²⁰ The boosts and capitalization on the technologies made sure that India's dependence on importing technologies goes down and slowly all the processes are internalized. According to the International Renewable Energy Agency (IRENA), "the Indian solar sector created 115,000 employment opportunities in 2018."²¹

Thus, the generation of solar energy in India is viable in economic terms both in terms of investment and employment opportunities; it will not be an easy shift from the traditional energy sources. Several problems are being encountered in this journey towards cutting carbon consumption. Some of these major issues are:

- The first and foremost issue that India faces is the utilization of land for large scale solar projects. India has a problem of land scarcity along with lengthy and complicated land acquisition legislations and whatever patches of land that may be available are not fit for solar power plants due to their geography and exposure to sunlight.
- Although India is trying to make sure that the promotion of solar energy is wide-scale, the progress in the field is still a little slow. As mentioned before there is a

¹⁸ Manu Karan, *How India in a short period of time has become the cheapest producer of solar power*, THE ECO. TIMES (May 5, 2021, 9:29 PM), <https://economictimes.indiatimes.com/small-biz/productline/power-generation/how-india-in-a-short-period-of-time-has-become-the-cheapest-producer-of-solar-power/articleshow/70325301.cms?from=mdr>

¹⁹ ENERGYWORLD.COM, <https://energy.economictimes.indiatimes.com/news/renewable/india-imported-solar-power-equipment-worth-1180-mn-from-china-in-apr-dec-fy20/74493914> (last visited (May 5, 2021, 9:52 PM).

²⁰ Gautam Das, *Solar boosts India's economic growth*, TOI (May 5, 2021, 10:17 PM), <https://timesofindia.indiatimes.com/blogs/voices/solar-boosts-indias-economic-growth/>

²¹ *Ibid.*

lack of skilled labour for developing solar power technologies and manufacturing the same.

- Since the projects are very different in size, i.e. domestic rooftops projects on one end and the large solar power plants on the other hand. The biggest drawback to this disparity in terms of the size of projects is the fragmentation of solar power market players. Those players involved in large scale projects may be able to reach their break-even point but those involved in small scale projects, may not be able to survive the market since imports are an integral part of the industry.

Yes, there are problems but the solutions follow up closely. Some suggestions are as follows:

- Land acquisition laws need to be relaxed and the Government has to play a formidable role in ensuring that the scheduled projects do not get delayed due to land hindrances. It has to ensure that the people who are being relocated are given adequate compensation and if possible one member from their family can be given jobs at these power project sites.
- The other major focus has to be on the distribution of the projects. As mentioned, since there is a big disparity in terms of project sizes, one of the important steps to consider is that for a large project the tender should not be given to one player only. Large scale project orders should be distributed among many manufacturers. This is a way of load sharing and generation of collective profits.
- A decisive role will be played by the investments as an attempt to localize the manufacturing process and to include skilled and unskilled labour practices.
- In order to kick start the renewable energy market expansion there initially needs to be more partnerships between the Governments and the International players.

From an economic standpoint, if investments are made in solar power, the break-even is expected to be achieved in 2-5 years and the annual saving of the consumers will be around 25% or more. Over a longer period of time, if we harness solar power and use it efficiently as a power source we are looking at an industry worth trillions of dollars. Therefore, solar power is both economically and ecologically viable.

The Largest Solar Power Parks in India

India has ramped up its solar power production in recent years and the nation is now home to some of the largest power plants in India. The Country's National Solar Mission was launched in 2010 – when just 10 (megawatts) MW of solar power was installed on the grid – with a target of 20 GW set for 2020.²² Some of the largest solar power plants in India are as follows:

1. Bhadla Solar Power (2,250 MW): This solar power plant which is based in Rajasthan is the largest solar power plant in the world which is based in Jodhpur, Rajasthan. It spans over an area of 14,000 acres and is a fully operational power plant.
2. Shakti Sthala Solar Power Project (2,050 MW): This is the second-largest solar power park in India which is located in Karnataka and spans over an area of 13,000

²² Shankar Besta, *Profiling the five largest solar power plants in India*, NS ENERGY (May 5, 2021, 10:17 PM), <https://www.nsenergybusiness.com/features/largest-solar-power-plants-india/>

acres of land. This project has reportedly benefited 2,300 farmers who have previously fallen victim to the region being located in a semi-arid tract that attracts very little rainfall.

3. Ultra Mega Solar Park (1,000 MW): This power park is located in Andhra Pradesh spans an area of more than 5,932 acres and is the third-largest power plant at a single location. It was set up at an investment of more than Rs. 7,143 crores (USD 943 million).
4. Rewa Solar Power Project (750 MW): The project located in Madhya Pradesh is spread over an area of 1,590 acres and is one of the major power suppliers to the Delhi Metro. It is the country's first and only solar project until now to be funded from the Clean Technology Fund and also India's only solar power plant to obtain a concessional loan from the World Bank's International Finance Corporation.
5. Kamuthi Solar Power Plant (648 MW): The solar power plant located in Tamil Nadu is the fifth largest power plant of its kind covering an area of 2,500 acres and was set up in 2016 with an investment of Rs. 4550 crores (USD 601 million). The plant is cleaned by a robotic system every day and has its own solar panels to charge it. The State Government's target is to achieve an installed capacity of 3,000 MW.

Government's Target for Achieving Solar Power in India by 2022

The National Institute of Solar Energy has assessed the Country's social potential of about 748 GW assuming 3% of the wasteland area to be covered by Solar PV modules. Solar energy has taken a central place in India's National Action Plan on Climate Change with the National Solar Mission as one of the key Missions. National Solar Mission (NSM) launched on 11th January, 2010 was a major initiative of the Government of India with active participation from States to promote ecologically sustainable growth while addressing India's energy security challenges. It will also constitute a major contribution by India to the global effort to meet the challenges of climate change. The Mission's objective is to establish India as a global leader in solar energy by creating the policy conditions for solar technology diffusion across the country as quickly as possible. The Mission targets installing 100 GW grid-connected solar power plants by the year 2022. This is in line with India's Intended Nationally Determined Contributions (INDCs) target to achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources and to reduce the emission intensity of its GDP by 33 to 35 per cent from the 2005 level by 2030.²³

The Government of India has launched the development of Solar Parks and Ultra Mega Solar Power Projects which has enhanced the capacity from 20,000 MW to 40,000 MW and these parks are to be set up by 2021-22. The Ministry provides Central Financial Assistance of up to Rs. 20.00 lakh per MW or 30% of the project cost. A scheme for setting up of over 5000 MW Grid-connected SPV power projects under IV of JNNSM Phase-II, setting up of distributed Grid-Connected Solar PV Power Projects in Andaman & Nicobar and Lakshadweep Islands with Capital Subsidy from MNRE, setting up of Central Public Sector Undertaking (CPSU) Scheme Phase-II (Government Producer Scheme) for setting up of 12,000 MW grid-connected SPV Power Projects by

²³ GOVERNMENT OF INDIA MINISTRY OF NEW AND RENEWABLE ENERGY, <https://mnre.gov.in/solar/current-status/> (last visited May. 05, 2021).

the Government Producers with Viability Gap Funding support for self-use or use by Government/Government entities, either directly or through Distribution Companies (DISCOMS). A Grid-Connected Solar Rooftop project is also under process for a cumulative capacity of 40,000 MW by the year 2022.²⁴

Limitations Of Solar Power Development In India

While solar power is an efficient alternate power source in India, there are certain limitations and bumps along the way harnessing this renewable source of energy. As discussed earlier in this paper, the production of solar energy takes place through Solar Photovoltaic (SPV) technique or Concentrated Solar Power (CSP). These techniques of harnessing solar energy are very expensive and economically not viable.

Also the technologies involved in the development of solar power are very advanced and extremely sophisticated. The technologies in this field are ever-changing and the players who are already well established in this market do not allow the new entrants a survival chance since reciprocation of their success is difficult. Furthermore, the main aspect is that the R&D related to solar power is not yet developed in India. All the foreign facilities and assistance received have thus made the process all the more economically unviable.

One major issue facing the harnessing of renewable energy is the land requirement. Setting up solar plants requires a vast area of land to be used. Since the investments are too high in purchasing such vast areas of land and the returns are uncertain, the parties interested in developing solar energy are few and unwilling to make such big investments. Also, building upon the point, clearing such a vast area of land has large scale environmental costs. In addition to this, the land allocation process in India is fairly long and incurs a lot of legal costs.²⁵

Impact of Covid-19 on the Solar Industry in India

The global economy went into a state of shock due to the measures put in place across countries to ensure the containment of the COVID-19 pandemic. The confinement of business activities due to the pandemic and the strict imposition of lockdowns and restrictions have created an unprecedented crisis in modern times and similarly, the solar industry has not been left untouched. The targets set up by the Government of India will be seriously impacted in the short and long term due to the impact of COVID-19 on the economy. The immediate challenges include shortage of manpower for developing solar infrastructure, lack of equipment and delay in delivery of certain products due to irregular transportation and decrease in the number of users whose pockets have also been impacted by this unprecedented crisis.

At present the Indian Solar Industry imports almost 80 per cent of its major value chain supplies from China which as per April-December Financial Year 2020 was estimated at around USD 1,180 million.²⁶ The pandemic has affected the manufacturing capacities of China, as all major ship container companies had also stopped functioning

²⁴ *Ibid.*

²⁵ S. Dawn, P.K. Tiwari, A.K. Goswami & M.K. Mishra, *Recent developments of Solar Energy in India: Perspectives, strategies and future goals*, 62 R&S ENERGY REV. 216, 233 (2016), <https://www.sciencedirect.com/science/article/abs/pii/S1364032116300570?via%3Dihub>

²⁶ *Supra* note 19.

out of Chinese ports and transporting goods from China to other countries, including India.²⁷ The government has already clarified that disruption of supply chains due to the spread of corona-virus in China or any other country should be considered as a case of natural calamity and force majeure clause may be invoked, wherever considered appropriate, following the due procedure.²⁸

Approximately 2.3 GW of the solar plants are running behind schedule as the deadline of commissioning was between June to August as the expected modules have been only supplied since March. Starting July projects worth over USD 2 billion are at risk of missing scheduled commissioning.²⁹ Further, the pandemic would have a huge impact on consumer buying behaviour and trends since the pockets of the common man have also been impacted and switching to a cleaner source of energy at this point would be unlikely to be a top priority in the long run. Hence, an economic stimulus along with several reforms has to be brought in by the Government if it wants to move gradually on the path of cutting carbon consumption. The decisions that the Government takes in the coming years will be very important to determine India's true commitment to the Global Community.

Conclusion

The need for a cleaner fuel or an alternative is now more than ever. India which strives to be a major player in the global economy has implemented several developmental schemes in various sectors. This has in turn, led to enormous energy demand and to maintain that progress, enormous additions in the energy sector have to be made. Considering the large potential, easy availability and other inherent characteristics of solar power, the Government of India has given more emphasis on the promotion of solar power in the Indian power scenario. In this paper, the authors have mapped the various legal institutions and their functions in making sure that the power crunch faced in the future does not hinder the growth of the country. The government has ensured that there is the smooth functioning of these institutions to oversee the efficient functioning of these solar power specific legislations and policies in place.

It is a fact that the road in curbing the power crunch of India is not going to be an easy task but this paper has shown that India is ready to take upon itself the responsibilities of figuring a way out. Solar power can also provide a better economic scenario after successful implementation of solar mission for all states of India, especially for some undeveloped states, where the potential of solar power generation is very good but has not utilized till date. There are hiccups along the way and India has to find a way to internalize all the technologies and the know-how for developing solar power, to make it cost-effective. There are various government projects underway to harness solar power and more and more players are playing a key role in the solar power market. This being said, India has come a long way and soon will be the World pioneer in harnessing solar energy and developing the technologies for the same.

²⁷ Gagan Vermani, *The short and long term impact of the Coronavirus (COVID-19) on the Solar Industry*, THE ECO. TIMES (May 7, 2021, 5:35 PM), <https://energy.economictimes.indiatimes.com/energy-speak/the-short-and-long-term-impact-of-the-coronavirus-covid-19-on-the-solar-industry/4292>

²⁸ MINISTRY OF DEFENCE (FINANCE), https://cgda.nic.in/ifa/circulars/IFA_120_15072020.pdf (last visited May 8, 2021).

²⁹ *Supra* note 27.

