Available online www.jsaer.com

***Journal of Scientific and Engineering Research*, 2017, 4(2):48-51**

Review Article

ISSN: 2394-2630
CODEN(USA): JSERBR

Climate Accord and Credibility to the Country's Ambitious 100 GW Target for 2022

Kachita Kohli

Department of Mechanical Engineering, Punjab University, Chandigarh, India

Abstract The year gone has been good in every field for the renewable sector with most key indicators growing in solar development around 3 times over the previous year. The country added total solar capacity of around 5 GW, an augmentation of 101% over year 2015 and surpassed the 10 GW cumulative total installed capacity. Looking to Madhya Pradesh bid in 2015, solar tariffs fell to INR 5 (USD 0.07)/ kWh, this was a turning point when India's solar power gained parity with other sources of Greenfield power.

Going downward cost has been instrumental in boosting solar demand from the DISCOMs despite total power demand staying relatively weak throughout the year. In coming days, we expect the INR 4 tariff level to be breached in early 2017, which will be a changing moment for the policy makers and entire power sector in India. The paper made some efforts to logically develop a study in solar capacity addition for sustainable development.

Keywords renewable sector, solar development, solar tariff, parity, Greenfield and sustainable development

Introduction

At present, almost 53% of India's energy requirements are met with coal; going by the predictions, the coal reserves of the country will not last beyond 2050.It is common knowledge that over 72% of the population of this third world country still resides in villages, with only about half of its rural population getting access to electricity. It is high time India moved to renewable ways to feed its population its fair-share of electricity.

As 2016 comes to an end, it is worth taking a holistic look at the Indian solar sector to analyse key trends, challenges and outlook. Key highlights include record project volumes both for capacity addition and issue of new tenders, improving power Distribution Company (DISCOM) financial position as a result of UDAY scheme, steep fall in equipment prices, improving M&A activity and India's ratification of climate accord adding credibility to the country's ambitious 100 GW target for 2022.

The year has been bountiful in all respects for the sector with most key indicators growing around three times over last year. The country added total solar capacity of 4.9 GW (estimated), an increase of 101% over 2015 and crossed the 10 GW cumulative installed capacity mark. New tenders were floated for 9 GW of grid connected solar projects including 900 MW for rooftop solar systems [1].

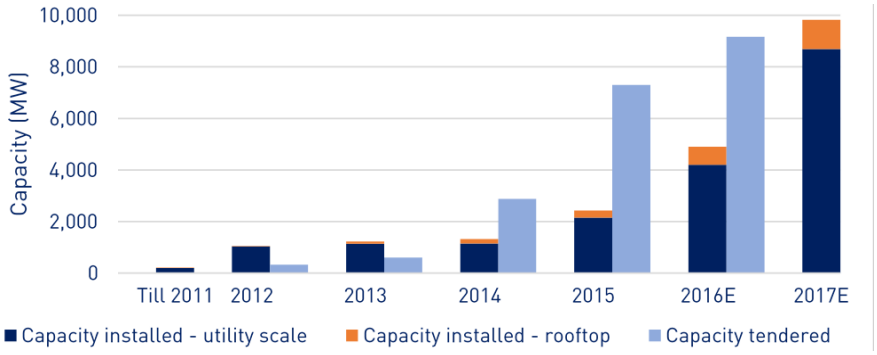

Figure 1: Solar Power Capacity addition journey

As solar tariffs fell below INR 5 (USD 0.07)/ kWh, solar power gained parity with other sources of Greenfield power. Falling cost has been instrumental in boosting solar demand from the DISCOMs despite total power demand staying relatively weak throughout the year. Both Solar Energy Corporation of India (SECI) and National Thermal Power Corporation (NTPC) are expected to allocate substantial new capacity in 2017 attracting even more competitive tariff bids. We expect the INR 4 tariff level to be breached in early 2017, which will be a radical moment for the entire power sector in India.

Indian project developers asserted themselves strongly in 2016 winning over 90% of tendered capacity. All of the top 10 developers by pipeline capacity are now 'home-grown' IPPs and corporates. Successful sale of solar assets of Welspun (to Tata Power), SunEdison (Greenko), Punj Lloyd (IDFC Alternatives) among others and international IPO by Azure has helped instil confidence in the sector's growth prospects. Falling module prices proved to be a gift that keeps on giving to aggressive bidders. Reduced Chinese demand in the second half of 2016 resulted in prices tumbling by 20% during the year [1].

India's rooftop solar segment also crossed the symbolic 1 GW mark in September this year, growing by 135% over last year. Attractive capital subsidies and substantial demand from public sector are expected to continue to provide great demand boost to the segment over the next few years.

All this positivity is somewhat tempered by growing incidence of delayed power purchase payments by many DISCOMs and curtailment risk, two risks which badly affected wind power sector during the year. Solar sector has so far been lucky to escape likely because of smaller capacity (9 GW vs 28 GW of wind power capacity) and much greater political attention. However, these risks pose significant challenges to the sector despite strong government support and UDAY scheme.

The world supply glut in modules consolidated the hold of Chinese suppliers in the Indian market as over 80% of all modules installed in India in 2016 came from China. The World Trade Organization (WTO) declared India's policy for domestic content requirement illegal and the proposed policy to support local manufacturing seems to be getting delayed. As a result, several 'Make in India' plans announced by various Indian and international suppliers have come to a naught.

Looking forward to New Year 2017, we expect total new capacity addition of over 9 GW (up 90% over 2016) and up to 8 GW of new utility scale capacity allocation by NTPC, SECI and states including Madhya Pradesh, Maharashtra and Tamil Nadu. As other international markets including China, Japan and Europe slow down, India will remain one of the fastest growing markets around the world. But we remain pessimistic about the new domestic manufacturing policy.

Indian Solar Capacity Surpassed 10 GW

India's total installed solar capacity including rooftop and off-grid segments has crossed 10 GW mark, a major milestone for the sector.

India is expected to add new solar capacity of 5.1 GW this New Year, which is a growth of 137% over last year. It expects average annual capacity addition of 8-10 GW per annum from this year onwards. The pace of sector activity has picked up tremendously in the last two years because of strong government support and increasing price competitiveness of solar power. India is expected to become the world's third biggest solar market from next year onwards after China and the USA. [3]

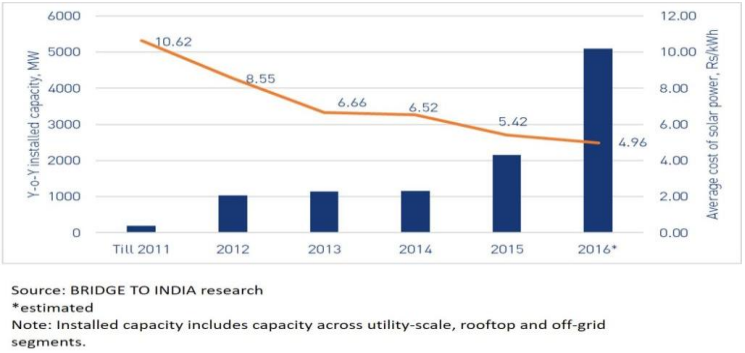

Figure 2: Solar Installed Capacity. Source: www.bridgetoindia.com

After new government came to power in 2014, it announced a major policy shift in India's energy sector by multiplying the 2022 solar target five-fold to 100,000 MW. Since then, it has launched multiple policy initiatives to support the sector. Ujwal DISCOM Assurance Yojana (UDAY) scheme is probably the most important such initiative as it seeks to strengthen India's weak distribution sector. The policy has already shown extremely positive results in the short-term. At least eight of the 17 states/union territories including some of the worst performing states like Haryana and Uttar Pradesh that have joined the UDAY scheme so far have reduced the deficit per unit of electricity. Moreover, 13 states/union territories have reported a material decline in Aggregate Technical and Commercial (AT&C) losses.

The solar park scheme has also been very instrumental in tackling the two major issues of land acquisition and power evacuation for project development. The government originally envisaged to develop 20 GW of solar park capacity by 2020 but the scheme has had an enthusiastic response from the private sector and the government is already planning to double this capacity to 40,000 MW. Further, eight green energy corridors are under construction, with financial assistance from German development bank KFW, to evacuate and integrate growing share of renewable energy into the grid. The corridors will allow transmission of solar power from solar rich states to other states.

Working Methods

Some key themes can be observed in the growth of the Indian solar market so far. Amongst states, Tamil Nadu has the highest installed capacity, followed by Rajasthan, Andhra Pradesh, Gujarat, Telangana, Madhya Pradesh and Punjab. These seven states collectively account for more than 80% of total installed capacity as of mid-November, 2016. Some of the larger power consuming states such as Maharashtra and Uttar Pradesh are way behind in the sector.

Utility-scale solar accounts for more than 85% of total installed capacity. Rooftop solar, so far about 10% of the sector, has also been growing at a very healthy CAGR of 98% from 2011 to 2015 and is expected to play an increasingly important role in the sector. Improving net metering implementation and subsidy disbursal are expected to lead to significant demand boost for rooftop solar across all consumer segments. There is also a very strong impetus on increasing rooftop solar deployment in government-owned buildings. Around 1.5 GW of potential rooftop solar capacity has been identified in central ministries and departments alone.

The off-grid segment, which is important from the point of view of increasing access to electricity and relieving stress on the transmission grid, has reached only 360 MW till mid-November 2016. With the government committed to expanding the grid and aiming to provide 24×7 electricity throughout India by 2018, this segment is unfortunately expected to perform below potential. [3]

The growing market has attracted attention of leading investors from both India and other countries including USA, Europe, Japan and China. The list of active project developers in the market includes very prestigious names including Softbank, Fortum, CLP, Adani, Tata Power, ReNew and First Solar.

Many people are going to ask the obvious question – if we have taken more than 5 years to achieve 10 GW, can we reach 100 GW in another 5 years? It is a very steep target in our view. But rather than quibble about the target, the important point is to acknowledge the transformational economic, environmental and social potential of solar technology and to create a conducive environment for its growth.

Results and Discussions

As the Indian market ramps up, it will become a key pillar for demand growth when demand in other leading countries including China, Japan and even possibly the USA is expected to slow down; despite concerns about weak power demand growth and growing incidence of grid curtailment, solar power outlook in India remains very strong; 2017 will be a bumper year for the sector in India with total installed capacity reaching around 18 GW by the end of the year.

There has been some concern about weak power demand growth in India and growing incidence of grid curtailment and what it means for growth of solar power. Demonetization may also impact power demand negatively. But we believe that continuing reduction in module prices and downward trend in domestic interest rates will provide strong ongoing demand impetus to the market. Solar tariffs are expected to fall below the

critical INR 4.00 (USD 0.06)/ kWh mark making solar power the cheapest new source of power. At the same time, improving financial health of power distribution companies due to UDAY implementation will also help in sustaining renewable energy demand in particular. We expect sustainable demand of 6-8 GW for utility scale solar in the coming years [2, 4].

As the Indian market ramps up, it will become a key pillar for demand growth when demand in other leading countries including China, Japan and even possibly the USA is expected to slow down. We already see leading international equipment suppliers paying more attention to this market and developing specific pricing and product strategies for India.

However, we are still unsure if improving domestic demand will lead to large-scale investments in Greenfield manufacturing capacity. Notwithstanding the Indian government's keenness to support domestic manufacturing as part of 'Make in India' campaign, the competitive dynamics are stacked against this sector.

Implementation of Goods and Services Tax (GST) during the year will lead to marginal cost increases and may create uncertainty for developers and contractors although there is a widespread expectation that any adverse impact will be passed through to the distribution companies.

Conclusions

India, with its booming economy and humongous population of over 1.2 billion, has always faced shortage of energy in the past. Even though the country is among the largest producers of electricity in the world, it is hardly ever able to meet the electricity requirements of its ever-so-rapidly increasing population. At present, almost 53% of India's energy requirements are met with coal; going by the predictions, the coal reserves of the country will not last beyond 2050. [coal power plant]. It is common knowledge that over 72% of the population of this third world country still resides in villages, with only about half of its rural population getting access to electricity. It is high time India moved to renewable ways to feed its population its fair-share of electricity.

It has emerged as the most viable and environment-friendly option for India to cater to the energy requirements of one and all including the 50% of its rural inhabitants who still live without electricity. A typical solar system is very easy to set up and just entails installing solar panels correctly in order for it to work. Quite a few people were already aware of its benefits and were really quick at setting their properties up with solar systems; in fact, the utilization of solar energy in India is nothing new and has existed in select locations for quite some time now. However, it has yet to pick up steady momentum.

Rooftop solar will also continue its spectacular growth trajectory in 2017. We expect around 1.1 GW of rooftop solar capacity to be added in 2017, up 75% from 2016, driven by capital subsidies and substantial demand from public sector.

Overall, 2017 will prove to be a bumper year for the solar power sector in India. Total installed capacity is expected to reach 18 GW by the end of the year.

Acknowledgements

Bridge to India is at best to provide considered knowledge to studentsand contributed to the present study work.

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