

Sunset: Turmoil in the Indian Solar Industry

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Abstract:

India will be a power surplus country this fiscal (2018-19) according to the Central Electricity Authority (Central Electricity Authority, 2018). India has become the lowest cost producer of solar energy (the International Renewable Energy Agency (IRENA), 2019). This has dropped substantially over the last decade and it seems to be on the same trend which will probably make power shortage in India a thing of the past. This will be good for economy, business and exports. the growth in solar plants will continue unabated, regardless of where the input comes from. There can be no logical economic or ecological argument against that considering the importance of global warming, economic growth and job creation.

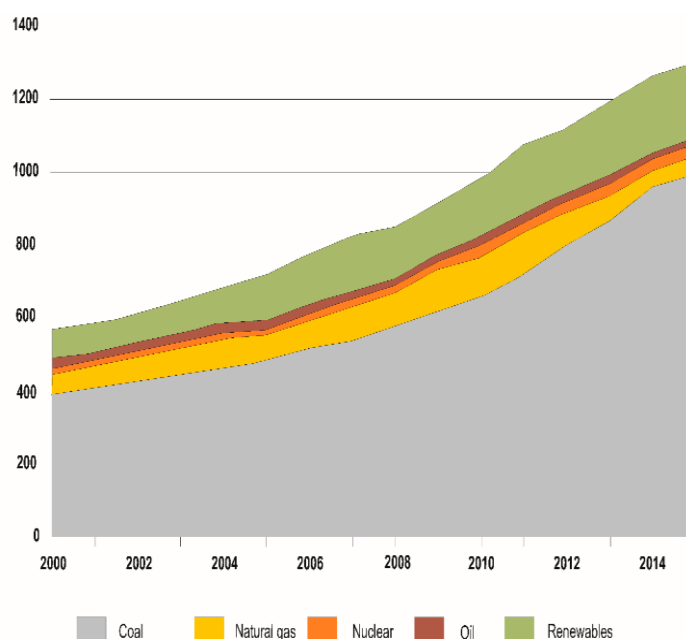
Index Terms: Solar Power, Sustainable, Cost, India

I. INTRODUCTION

India will be a power surplus country this fiscal (2018-19) according to the Central Electricity Authority (Central Electricity Authority, 2018). In addition India has become the lowest cost producer of solar energy (the International Renewable Energy Agency (IRENA), 2019). This has dropped substantially over the last decade and it seems to be on the same trend which will probably make power shortage in India a thing of the past. This will be good for economy, business and exports (including power exports). So indeed this should be a great milestone. However there is a deep dark side, which this research seeks to explore. This case study research seeks to take the form of exploratory research. Case study research is often appropriate to explore an industry or an economy (Yin, 2003).

Viability of the power sector in India

The below chart shows the growth of power generation in India, while also showing the breakup between various power sources and it can be seen while the growth of all sources is up the solar energy is growing at a faster pace and is also taking a bigger part of the pie.



(Lari Shanlang Tiewsoh 1, 2019)

The power sector at this time is in deep financial is an understatement. Barring an intervention by the Supreme Court many of these power plants would be currently in insolvency, the defaulted amount is in the range of Rs. 2000 Crores. "Huge delay and non-payment by power distribution companies are the primary cause for stress in the sector. If these dues are liquidated, not only would it enable power companies to service their debt on time, but also

enable smooth and efficient operation,”state the power plant owners (Business Standard, 2019). But is the problem that simple? Tariffs of solar energy have plummeted to ₹2.44 per unit from high of ₹14 per unit not very long ago. Thermal energy cannot compete with that. In addition the stressed The external debt of state-owned electricity distribution companies (discoms) is set to increase to pre-UDAY levels of ₹2.6 lakh crore by the end of this fiscal. With most states having limited fiscal headroom, continuous financial support to their discoms may be difficult, which forces these discoms to become commercially viable through prudent tariff hikes and a significant reduction in technical and commercial losses (Live Mint, 2019). So this deep financial problem will require the electricity distribution companies to go to less expensive options like solar power, but where does that leave power companies which comprise mainly of thermal power which now have stressed assets worth over 1.75 Lakh crore thermal power assets are looking to become non performing or already have become non performing

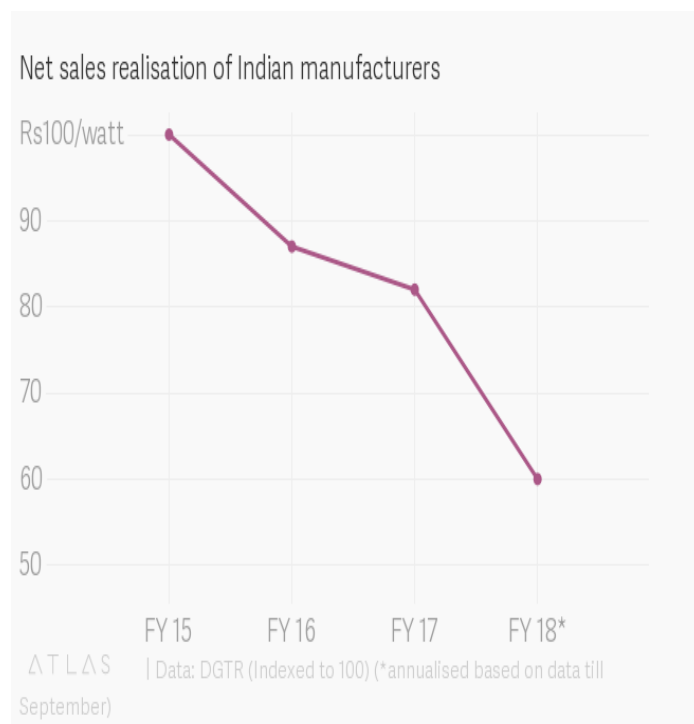
(<https://www.thehindubusinessline.com/opinion/the-hidden-costs-of-green-energy/article25508071.ece>, 2018).

So more inexpensive solar power becomes, more unsustainable both thermal power becomes. Especially with roof top solar panels which essentially can deduct whatever solar energy they are getting from power distribution companies and moreover can charge what they supply to the grid. This essentially can spell disaster for the power distribution companies.

Solar Cell Manufacturing

Surely where the power companies are struggling we have the solar cell manufacturing companies which benefit from this. Unfortunately 90% of the solar cells installed in India are imported from China (Singh, 2019). There are no Chinese subsidies which can be contested at WTO. Tariffs are not only unsuccessful; it will not help the cause of Indian solar cell power units. Indian solar cell manufacturing is not likely to be competitive for a long time. This is because the solar cell is not a standalone development but an evolution of the semiconductor industry. At this time there are no large semiconductor manufacturing operations in India and

though the future is promising it is likely to take its own pace, which puts solar cells even further away in the value chain.



Few believe that two years of safeguard duty will turn the tide for India's solar panel makers. In June, to manage the state-run renewable energy fund's \$15.6 billion deficit, China unexpectedly suspended huge subsidies to its solar project developers. This cut the demand for cells and panels in its domestic market, intensifying their glut in foreign markets and further driving down prices. While the safeguard duty does add to the price tag of Chinese imports, they are still cheaper than domestic panels and cells, according to The Council on Energy, Environment and Water (CEEW), a New Delhi-based think tank. If any discom purchases renewable energy at Rs 2.44 per unit, then along with the fixed cost (which they will have to pay to thermal stations under PPAs, whether or not electricity is procured), the total per unit cost would come to Rs 4.04, which is higher than the average price of Rs 3.25 a unit that discoms pay for thermal power, Singh wrote to finance minister Arun Jaitley recently. Since renewable energy is intermittent, he added, the achievement of renewable energy capacity of nearly 88,000 MW (71,300 MW established and 17,500 MW under construction) could only happen after constantly pursuing with states, but states have flatly refused to sign PPAs for

renewable energy if rates are any higher. Also Discoms are averse to promoting rooftop solar for at least three reasons. First, with utility solar, they are able to cross subsidise in a bigger way. Second, besides, the current net metering formula in many States does not offer any gains to Discoms. Third, rooftop solar also threatens to further destabilise their finances. To take the last point first, open access purchase and captive generation already account for a rising share of total power purchase by large-scale commercial consumers, putting the Discoms' cross-subsidy model in jeopardy. If rooftop solar gains ground, it will lead to a further exodus of buyers. This will hurt both the availability as well as the cost of electricity for agriculture users and poor consumers. Clearly, cross-subsidisation cannot carry on. As experts have observed, Discoms need to overhaul their business model by separating their functions of wiring and providing electricity. Short-term open access, that often throws Discoms' power purchase plans out of gear, should not be encouraged. Net metering rules for rooftop solar should be tweaked to make them attractive for Discoms as well. As with renewable purchase obligations, the Discoms should be given tangible net metering targets.

The argument that excessive solar feed-in will destabilise the grid is somewhat overblown, as the grid can be strengthened to deal with the situation. The long-term gains, environmental and economic, will offset such an investment. Germany's renewables transition has been driven by rooftop solar. (Giving solar power a leg-up, 2019).

II. LITERATURE REVIEW

The Chinese story gives perhaps a view of things to come in the Indian Industry. The Chinese have not been effective manufacturers for a long time and it was doubtful whether their strategy was sustainable (Campilo, 2008). Some policy changes are definitely required, However even with abundant sunlight, one of the lowest solar power producing costs in the world, India has no clear policy to address these issues (Pushpendra Kumar Singh Rathorea, 2018). The net metering type of business model that is already in vogue in the international scenario may be feasible in India, where the roof is rented to a third party for lease and the generated electricity in turn is fed into the utility grid and for selfconsumption to the

rooftop owners at a subsidized cost or less than that of the cost of the utility grid (Vedamuthu, 25 MARCH 2015). However the reality suggests that it is not feasible as the solar cells, though slightly expensive to install can turn net providers to the grid which then becomes an expense for the electricity providers. At present more than 80% Indian solar value chain is mostly dependent on the imports and lacks economy of scale for the domestic manufacturers. If it continues, the industry will end up perpetuating dependence on imports and this would not be in the country's interest as far as concerned to energy security. (TERI, 2019)

III. CONCLUSION

It appears that everyone in India will have access electricity at a low cost however it clearly looks like thermal power plants are in deep financial trouble. The power distribution companies are already facing a very deep financial crisis. The solar power producers are facing viability issues due to deep drop in solar power tariffs. The manufacturers of solar cells are facing very high level headwinds. The rooftop solar power panel projects while costing the home owner may end up bankrupting the distribution companies. Solar power is not available at night but as it appears nothing might be.

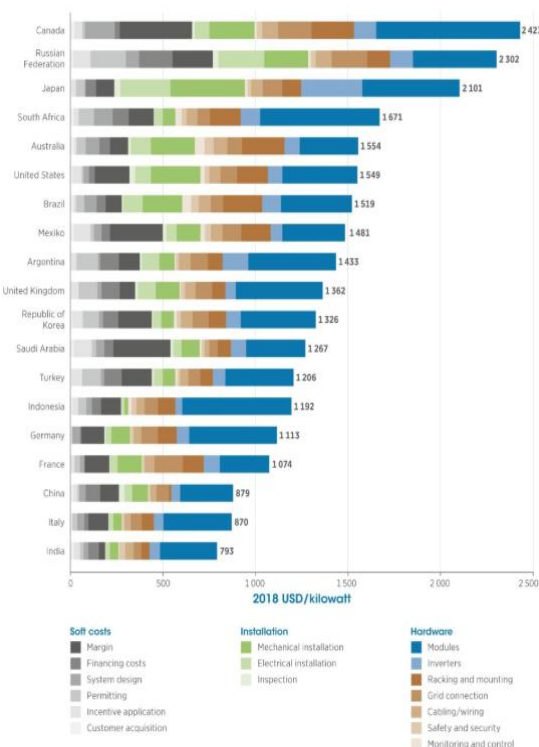
IV. RECOMMENDATIONS FOR FURTHER RESEARCH:

It clearly appears that there can be no solution in the manufacturing sector, as the industry cannot compete with the Chinese imports in the short run, however the Chinese imports cannot be banned without raising the costs of solar panels and the costs of the solar panels going up. However if the Government of India sees this as a strategic sector, it could encourage efficient manufacturers from all over the world including China to setup manufacturing in India and effectively banning imports. This could keep the cost of manufacturing low. However that still does not solve the problem of low solar tariffs. The thermal plants may have a life span of over 50 years and many of them are far from recovering their investment. The cost per unit is more than double the solar power cost. So is there a possibility of keeping the tariffs artificially high. The market may not support it as solar power is extremely inexpensive, so could the government subsidize the thermal power for the next fifty years that seems to be a very prohibitive

proposal. However it is very clear that the solar power cannot provide power 24 hours a day. However as batteries become efficient that problem may also be solved. It is clear that no new thermal or power plant can be feasible. In the case of nuclear power plants they are a strategic requirement. The same cannot be said about thermal power plants. At this particular point this looks like a complex problem with no clear solution available. The power assets will continue to be stressed. The manufacturing plants will continue to be even more stressed. Solar cells may actually be the main imports of India in post hydrocarbon era.

Are the costs at the rock bottom right now, various reports suggest that is not the case. Lower labor costs are the primary reason for urban China's MSP advantage over the rest of the world, but it definitely cannot be against India in the long run. In urban China, labor's shares of manufacturing costs are only 11% for wafers, 5% for cells, and 2% for modules. Here actually India can be fairly competitive with China. Only 30% of labor needs to be skilled, the remaining can be semi skilled and unskilled. So this sector can create a lot of jobs which are a political imperative for the government. A large solar plant for 500 MW capacities can be constructed within 18 months while a similar thermal or hydro plant might take 2-3 times more. There is absolutely no economic incentive for the government to stop setting up solar power plants. The lands where they are setup also are often land which cannot be used for any other purpose and are arid or non agricultural land. So the growth in solar plants will continue unabated, regardless of where the input comes from. There can be no logical economic or ecological argument against that considering the importance of global warming, economic growth and job creation. The further research may perhaps just focus on how to make the stressed power assets more viable perhaps with subsidies, grants etc since this growth in solar industry is overall positive. It maybe that thermal power sector may enter a zone of permanent sickness. However that needs to be further researched. India currently produces the cheapest solar energy in the world ((IRENA), 2018). There is no reason for it to give up the leadership in that area.

Total installed costs in 2018 by component and country



However there needs to be some policies and research done to find out how the elements which are facing stress can be handled without disturbing this remarkable growth story.

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