

Solar businesses for Bharat

An average Indian consumes a quarter of the electricity used by an average Chinese. This isn't because we're particularly frugal. It's simply because in most of Bharat, particularly states like Uttar Pradesh, Jharkhand and Bihar at least two out of three rural households are in the dark. In light of this, our government's futuristic aspirations of a digital India feels like a dark comedy. India will face a huge energy supply-demand mismatch for the foreseeable future. Importing almost half of its energy requirements, and bringing with it a hovering cloud of import dependence, and currency fluctuations.

We are the third-largest energy consumer in the world. This is despite the fact that one in four Indian households do not have access to power. With increasing income levels, the growing digital economy, and access to modern amenities, energy consumption of the average Indian will increase at least two-fold over the next decade. Factors like increase in mean temperatures, scarcity of ground water, will only exacerbate demand. Needless to say our coal-powered plants will fail to keep up with the growth. If we keep burning coal and oil for energy, 4 out of 5 cars, and an equal ratio of plug points will run on imported oil and coal. The question then arises—how can Bharat power itself?

A look at Shell's global energy resource database brings out the stark mismatch in demand and supply between different countries. Approximately 50% of the world's oil and gas capacity is concentrated in five countries—the US, Russia, Saudi Arabia, Iran and Iraq—in that order. About 80% of the world's coal is concentrated in the US, China and Russia. In this scheme of things, India has less than 1% of the world's share of fossil fuels. On the bright side, India has 15% of the world's solar capacity. These numbers make it self-evident that the path to India's energy sufficiency lies in renewables, especially solar and wind. However, to walk this path, India must develop the ability to convert this capacity efficiently and cost effectively into energy supply.

Indian policymakers are neither unaware of this mismatch nor dormant on this front. In fact, over the last few months we have seen a lot of hubbub over solar being the answer to India's energy future. India's targets at the Paris agreement and policy movements encouraging more auctions for solar power plants are all moves in the right direction. The cost of solar power has dropped by an order of magnitude in the last decade.

It is now possible for solar power to be as mainstream as coal. The report on *India's renewable electricity roadmap 2030* released by NITI Aayog attempts to do this by laying a policy road map aimed at bringing renewable power to the mainstream. This takes into account the need to make the distribution infrastructure robust by ensuring seamless integration of renewable power to the main power grid.

With both policy and economics falling in place, the time is ripe for Bharat to build thriving businesses in this sector. So far, this space has been dominated by investments in utility scale power plants, characterized by historically low price bids for power purchase agreements (PPAs) by solar power companies. The stampede to outbid and win contracts for massive infrastructure build-outs is encouraging. These large-scale utility projects have accelerated the learning curve in technology resulting in a steep drop in infrastructure costs. As infrastructure build-outs get increasingly commoditized, it is now time to take a look at other solar businesses that Bharat can build in this ecosystem.

First among these, are third party operations and maintenance service providers for large utility projects. Because building and maintaining long-term cost viability of these projects require two very different skill sets. These service providers will need to develop technologies and standard

operating procedures to keep costs low while maintaining high standards of power production—on both quantity and quality. In the next five years we estimate an annual market of Rs1,000 crore for these services that will address the 100 gigawatt (GW) of total planned installed capacity. The need for well performing service providers will also gain significant importance with an expected shift in the nature of investors in utility projects from specialist solar or wind companies to purely financial investors who would prefer asset management by third party service providers.

The other space primed for new and innovative businesses is that of distributed generation. Distributed solar power generation will enable localized micro-grids obviating the need for a centralized generation infrastructure. Until now, poor connectivity, high cost of operations and maintenance, and the lack of a financing ecosystem have stood in the way of solar micro-grids. With improved connectivity, lower cost of technology solutions, and the emergence of third party operations and maintenance service providers, micro-grids might finally be viable.

As technology, policy and economics evolve, there will be more businesses that can be built to strengthen the ecosystem. At this time, however, the two areas mentioned are rife with opportunity. In parts two and three of this three-part series, I'll attempt to outline an operating and financing model for these businesses. And then we might just be able to make some hay when the sun shines.

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