

The Ripple Effect of Domestic Module manufacturing on India's Solar Ecosystem



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Manufacturing in general, especially tech. manufacturing, has been a missing element from India's basket of economic activities. Economic theories suggest that out of all the economic activities' categories, manufacturing carries the maximum beneficial spillovers on an economy. The GOI has targeted increasing the share of manufacturing in the national GDP pie to 25% by 2025 from 17% of the share currently. Solar module manufacturing, along with its upstream products, has been part of a technologically and operationally challenging arena. It is very close to semiconductor manufacturing, which is technologically intensive. For a long time, the western world had monopoly in manufacturing upstream products, viz. polysilicon, wafers etc. before China started manufacturing these products at scale. India has been missing from this manufacturing front until now. India, in large part of its solar history, majorly imported solar modules for developing its solar projects. Indian solar module manufacturing facilities have limited updated manufacturing capacities. Also, Indian solar module manufacturing is not cost competitive if we compare it with that of the Chinese players. Further, most of the solar cells (feed to solar modules) are imported from China, for India has limited cell manufacturing capacities as well. Manufacturing of further upstream products like wafers, polysilicon etc. is not available in India at commercial scale. PLI

scheme for manufacturing solar products, along with other tariff barriers like 40% BCD (Basic Custom Duty) on import of solar modules and 25% on import of solar cells make solar manufacturing attractive in India.

India has targeted the renewable energy capacity of 500 GW by 2030, which is part of India's larger commitment to its net zero mission by 2070. For the mission to be successful, India ought to develop its value chain in the solar manufacturing so that the mission is not subject to the vagaries of international geo-politics and Chinese module supplies. Secondly, though needless to mention, it would help save a huge chunk of foreign capital movement out of India, in turn limiting the CAD (Current Account Deficit) of India. Thirdly, the scale of module production would help to develop the ancillary and technologically advanced raw material industries, like silver paste, diamond wire etc. which require offtake at scale to be viable in terms of quality and cost. The raw material industry, like Aluminium frame, Glass etc. finds its usage in other industries as well. Fourthly, once we manufactured solar products, we would manufacture the equipment and robotics necessary to manufacture the products, for then we have enough scale in solar to motivate entrepreneurs to develop the industrial equipment facilities. Once the equipment manufacturing capability is developed, it would help with the applications in other industries also.

If we see the medium to long term effects, we expect to observe the manufacturing processes and ecosystem cross-pollinate in other industries. It would unlock optionality in future to develop related and new industries. With this development, India can step up its R&D activities at large, which would build products in all economic streams. It would align the political machinery and investors towards manufacturing to complete the full-blown manufacturing ecosystem. This eventually will make India not only less dependent on exports, but also a go-to nation for hi-tech manufacturing.