

# Exporting Solar to the World: Prospects for India and the International Solar Alliance

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## Executive summary

- The Government of India has made the domestic manufacture of solar cells, modules, and associated materials and components a key priority.
- This agenda has implications for the flagship India-France programme, the International Solar Alliance (ISA).
- As Indian manufacturing capacity grows, India's partnership interests and profiles with Southern partners may tilt from finance and expertise to exports of solar goods.
- Existing ISA programmes present opportunities for Indian solar exports, yet any exports agenda will need to overcome cost and financing challenges and navigate geopolitical and diplomatic risks.

## Introduction

In recent months, India's Prime Minister, Narendra Modi, and government ministers, have repeatedly stated that fostering indigenous solar manufacturing to achieve solar self-sufficiency is now a key priority for their government. This represents a significant development and an enormous challenge. While India has successfully increased solar *installation*, it currently only has a limited capacity for the *manufacture* of solar photovoltaic (PV) cells and *assembly* of solar modules. Imports meet nearly all of its domestic demand: in 2017/18, for example, over 90 per cent of solar cells were imported<sup>i</sup>. Furthermore, it does not produce solar wafers, ingots, or polysilicon, the base material used to make solar cells. Indian

module manufacturers were internationally competitive into the 2000s. However, since then they have not invested significantly in capacity, and have been outpaced on price and technology, particularly by Chinese firms<sup>ii</sup>.

This shift is primarily being examined with regard to India's domestic circumstances<sup>iii</sup>, but this paper explores ramifications for India's development of the International Solar Alliance (ISA). Since 2015, India has been building the ISA, together with France, to facilitate cooperation amongst 'sunshine belt' states located geographically between the tropics of Cancer and Capricorn on increasing solar power installation. To date, the ISA's activities have focused on awareness raising, know-how, finance, the cost of

solar technology, and training. In the meantime, solar manufacturing has become increasingly concentrated in other countries, above all, China. In pursuing solar manufacturing, India's interest will increasingly lie in developing the ISA as a platform that delivers opportunities for domestic solar manufacturers. The paper looks at where opportunities exist through ISA programmes to develop Indian trade, and the challenges India will face in realising these. It concludes by arguing that the pursuit of exports through the ISA will face geopolitical and diplomatic risks and will have to carefully navigate post-COVID economic and political contexts.

### Why solar self-sufficiency now?

India's re-evaluation of solar manufacturing, beyond longer-standing commitments to greater installation, has two main intertwined explanations. First, the focus is part of the government's emerging post-COVID economic agenda. In May, Modi announced a wide ranging 'Self-Sufficient India Plan' (*Atmanirbhar Bharat Abhiyaan*) to promote domestic supply chains for key goods and services in order to catalyse economic growth, innovation, jobs, and self-sufficiency<sup>iv</sup>. An industrial solar base is being positioned as essential for India's economic development and ambitions for a green economy<sup>v</sup>. Second, it emerges from specific anxiety about India's reliance on China for key goods and services, further charged by recent military confrontations in the Himalayas. Between 2014/15 and 2017/18, solar imports from China increased by 671 per cent<sup>vi</sup>, and in 2018-19, India imported US \$2.16 billion worth of solar goods alone from China<sup>vii</sup>. The Indian Government has an ambitious target to reach 100 gigawatts (GW) of solar capacity by 2022, and commentators and the media have lamented the country's reliance on China to meet this target, framing the issue as an economic missed opportunity and national security risk<sup>viii</sup>. Modi has identified the lack of solar manufacturing as stopping India from meeting its full solar development potential<sup>ix</sup>.

Solar manufacturing has previously been on the political agenda, but government action was

piecemeal. In 2010 the Congress Party-led government introduced a domestic content requirement policy mandating solar projects use domestically produced modules<sup>x</sup>. However, the USA successfully challenged this at the World Trade Organisation (WTO), and the policy was abandoned. In 2014, Modi's Bharatiya Janata Party (BJP)-led government launched the high-profile *Make In India* scheme. Solar components production was one focus of this, with strong symbolic cachet<sup>xi</sup>. Plans for a US \$3.1 billion solar manufacturing package were floated in 2016<sup>xii</sup>, and the Ministry for New and Renewable Energy (MNRE) released a concept note for a 'Solar PV Manufacturing Scheme' in 2016<sup>xiii</sup>. Neither come to fruition. In 2018, a Safeguarding Duty on solar imports was introduced, set at 25 per cent for one year and 20 and 15 per cent for two further six-month periods<sup>xiv</sup>. Introduced as a temporary measure, it did not incentivise long-term investments in manufacturing. Overall, the Modi government prioritised low-cost installation over initiating manufacturing capacity<sup>xv</sup>.

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Now, in the altered economic and political context of COVID and its aftermath, a more sustained effort from the Modi administration on solar manufacturing can be expected. In June, the government announced a Customs Duty on imported solar cells and modules was planned for August 2020, to start at 20 per cent and potentially increase to 40 per cent<sup>xvi</sup>, although this is yet to be implemented. In July, the current Safeguarding Duty was extended, at 14.9 and 14.5 per cent for two six months periods<sup>xvii</sup>. The government has launched manufacturing linked solar tenders<sup>xviii</sup>, requested State governments identify land for industry<sup>xix</sup>, and is creating a list of approved manufacturers for government-supported schemes<sup>xx</sup>. However, further measures will be required, and fostering a successful domestic

industry, which is far from guaranteed, will take time. Manufacturing in India faces multiple hurdles, including relatively high costs of key materials, electricity, and financing, as well as challenges with land, logistics, and access to technology<sup>xxi</sup>. Analysis from CEEW points to the need for a range of policy measures, financial subsidies, infrastructure investment and non-financial concessions<sup>xxii</sup>.

## India's leadership of the International Solar Alliance

A central plank of the Modi government's climate diplomacy and foreign policy has been India's leadership of the International Solar Alliance (ISA); the first United Nation's intergovernmental organisation to be headquartered in India. Emerging from the Paris Climate Talks, the ISA was established as a platform for low- and middle-income 'sunshine belt' states to work jointly to increase solar energy installation, and to facilitate support for this from high-income states with access to finance and technology, as well as bilateral and multilateral organizations, corporates, and industry. It was to be action-oriented, member-driven, and collaborative. The ISA Framework Agreement has been ratified by 68 states.

India has developed the ISA according to the long-standing principles of South-South solidarity and cooperation<sup>xxiii</sup>. Having had significant success with developing and bringing down the cost of large solar parks domestically<sup>xxiv</sup>, the Indian government says that it wants to share its know-how with other developing states<sup>xxv</sup>. This approach builds on India's longer history of solar power knowledge and training cooperation with partner countries through the Indian Technical and Economic Cooperation (ITEC) scheme. The ISA has been diplomatically popular, and India is comfortable with this focus on 'virtuous' programmes that are projected as being geopolitically uncontentious and focused on practical action.

To date, the ISA's activities have focused on five areas. First, awareness raising and assessments of solar potential in member countries. Second, support to governments on writing solar policies and project

preparation for solar parks. Third, the incubation of the 'Common Risk Mitigation Mechanism' (CRMM) to reduce the cost of capital for the development of solar parks, which was taken forward in a modified form by the World Bank as the 'Solar Risk Mitigation Initiative' (SRMI)<sup>xxvi</sup>. Fourth, demand aggregation and price discovery tenders. Here, the ISA has worked with member countries to ascertain demand for off-grid solar technologies, for example for solar water pumps, and has then run tenders to discover the lowest price at which manufacturers will deliver these. Fifth, the development of training intended to deliver skilled workers for emerging solar sector jobs.

Indian trade has been an aspirational but underdeveloped aspect of the ISA. In 2018, at the launch of the ISA in New Delhi, Modi said that India would finance US \$2 billion of solar projects in member countries, through Lines of Credit to be administered by India's EXIM Bank. India's Lines of Credit require at least 70 per cent of funds be used for the procurement of goods and services from Indian suppliers, so this heralded a tangible opportunity for Indian business. However, while the Ministry of External Affairs reports agreements for 27 solar projects in 15 countries totalling nearly US \$1.4 billion<sup>xxvii</sup>, few of these projects are yet operational. Data from India's EXIM Bank shows US \$994 million of solar projects between 2010 and 2020<sup>xxviii</sup>. Many of these projects pre-date the ISA and US \$560 million are pipeline projects which are still to be finalised.

## Utilising the International Solar Alliance to deliver Indian exports

As India's agenda for domestic solar manufacturing unfolds, the government's interests will increasingly lie in using the ISA to expand export opportunities for Indian solar businesses. Indian commentary on the country's emerging solar agenda is already calling for the country to pursue opportunities to export through the ISA<sup>xxix</sup>, with some explicitly saying the success of India's drive to solar self-sufficiency will rest on doing so<sup>xxx</sup>. The Indian government appears to be moving in this direction. July 2020 saw reporting that India's

Ministry of External Affairs is pushing its Missions around the world to identify opportunities for the export of key goods, to support India's self-sufficiency agenda and domestic manufacturers<sup>xxxv</sup>.

Two existing ISA programmes hold promise for Indian exports. First, the ISA solar parks initiative. The ISA has been working with member countries to help them to formulate plans for solar parks, and to secure private sector financing for these. Already, this programme is providing opportunities for Indian business. Two ISA members, Mali and Togo, recently signed deals for *NTPC Limited*, an Indian public sector energy conglomerate, to project manage two solar parks<sup>xxxii</sup>. At the ISA's 2020 World Solar Technology Summit, it was further announced that *NTPC Limited* would develop solar projects in 47 ISA countries<sup>xxxiii</sup>, although concrete details of this are yet to be released. *NTPC Limited's* website reports ambitious plans for the company's solar portfolio internationally<sup>xxxiv</sup>. In the coming years the Indian government will be well placed to push for ISA projects being project managed by Indian firms to use Indian modules.

Second, the ISA's demand aggregation programme has potential for exports. The ISA is working with member countries to aggregate demand collectively for a range of off-grid solar technologies, including so far for solar-power water pumps, to be used for agricultural irrigation, and solar home systems. In 2019, the ISA reported that it had discovered demand for 270,000 solar water pumping systems across 22 member countries. It contracted the Energy Efficiency Services Limited (EESL), a Government of India enterprise, to conduct a bidding process for manufacturers to discover the lowest price at which these could be supplied<sup>xxxv</sup>. Of the five companies to bid, four were Indian<sup>xxxvi</sup>. In 2020, the ISA

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announced demand aggregation plans for Solar Home Systems. It is planning a tender to invite bids for the supply of 48 million Solar Home Systems<sup>xxxvii</sup>. Indian firms are well placed to secure contracts to supply large orders of off-grid solar products from ISA members.

However, significant challenges lie in the way of ISA programmes bearing fruit for Indian firms. The first is bringing down the cost of Indian solar products. Currently, Indian made solar modules are approximately 33 per cent more expensive than equivalent Chinese modules<sup>xxxviii</sup>. Until Indian manufacturers are price competitive, Indian solar technology will not be widely attractive to ISA member countries, unless they are heavily subsidised.

The second challenge is financing. For solar parks, even while ISA countries may want to proceed with new projects, most will require external finance. One option for the Indian government would be to use Lines of Credit to finance solar parks that are using Indian solar technology. As noted above, in 2018 Modi announced that India would be providing US \$2 billion of Lines of Credit to ISA member countries. So far, much of this money is yet to be disbursed, so should be available. Beyond this, solar parks will only proceed if the ISA can facilitate the flow of public or private capital into ISA solar parks. The ISA is currently seeking international support for a 'World Solar Bank' to fund ISA solar projects, which India could push to fund solar parks that use Indian solar modules. It is reportedly initially looking to raise US \$10 billion, with the Indian government ready to commit US \$3 billion<sup>xxxix</sup>. However, even if such a fund is established, so long as Chinese solar products remain the most price competitive, it will be hard to make the case that ISA solar projects should use Indian solar modules.

On its demand aggregation work, the ISA is yet to show how the bulk purchasing of off-grid solar products would be funded on a sustainable or large-scale basis. Existing ISA information states that for solar-power water pumps the organisation is looking at various business models that will see users pay back the cost of products that they receive. The suggestion is that this would be managed by member states. The ISA is

yet to set out details on financing for their other demand aggregation projects. Again, India might use Lines of Credit here. Beyond this, India and the ISA could seek funding from Development Assistance Committee (DAC) donors and development finance institutions (DFIs). DAC donors and DFIs are actively supporting off-grid solar deployment through the global South, as part of the global push to meet the United Nation's Sustainable Development Goal Seven of 'affordable, reliable, sustainable, and modern energy for all'. However, to date, DAC donors and DFIs have focused almost exclusively on initiatives that promote private off-grid solar markets. They are likely to be wary of the ISA's demand aggregation programme, because it involves the government-led selection and deployment of solar technologies and could disrupt existing private markets. Finally, while India may want to leverage private finance for demand aggregation, this would be reliant upon demonstrating effective business models, alongside using public finance to de-risk any private investment.

A third challenge is that the ISA is an inter-governmental treaty-based organization, and therefore India cannot easily ensure that ISA projects choose Indian products and exclude non-Indian competitors. Already, this has emerged as an issue. After the ISA announced in 2020 that it was running a tender process for the supply of Solar Home Systems there was media speculation about excluding Chinese suppliers from this process; however, it appears that doing so would have broken the ISA's rules<sup>xi</sup>.

### Looking forward: Securing exports while navigating geopolitical and diplomatic risks

The coming few years will reveal how successful India is in fostering an indigenous solar manufacturing ecosystem. Beyond tackling the domestic challenge of promoting solar production, the Government of India will have every incentive to pursue export opportunities for its domestic firms, in particular through the ISA. India's partnership interests and

profiles with Southern partners may tilt from finance and expertise to exports of solar goods.

Seeking a closer coupling between Indian solar diplomacy through the ISA and trade will entail diplomatic and geopolitical risks, even though it is congruent with the direction of development cooperation around the world. The ISA as a platform for cooperation on know-how and financing among member countries to advance shared agendas for solar development has been diplomatically well-received. Operating in this way fits with India's narrative of its cooperation being non-conditional and based upon partner needs, a narrative that is increasingly delivered alongside one framing Chinese lending through the Belt and Road initiative as leading to debt traps<sup>xii</sup>. Pushing for ISA projects to use Indian solar products, for example through tied loans, and likely at higher prices to alternatives, could easily come into tension with the ISA's South-South cooperation principles, and would not be in the interests of countries to minimise the cost of electricity. Any moves to exclude Chinese firms from bidding for ISA contracts, as has been suggested<sup>xiii</sup>, would risk politicising the ISA, and again runs counter to ideas of South-South collaboration. These risks might be reduced with ISA projects having rigorous project preparation, and high levels of transparency and reporting.

On the other hand, India's agenda to develop a competitive solar industry would likely have longer term external benefits in providing enhanced manufacturing capacity to a growing global market, and a more diversified and competitive set of suppliers. With many governments and firms now concerned about supply chain security, India has a clear opportunity to secure international support for its domestic solar industry, whether in the form of technical partnerships or foreign direct investment. The recently announced 'Resilient Supply Chain Initiative', set-up by India, Australia, and Japan with the goal of building resilient supply chains in the Indo-Pacific, is the kind of initiative that India might use to win international support for its solar agenda<sup>xiiii</sup>.

Efforts to expand solar exports through the ISA will be taking place in an altered post-COVID economic and political international context. Countries around the world are set to be focused on economic recovery and, ostensibly, trying to 'build back better' with green economic growth and jobs. Many are re-evaluating manufacturing as a matter of national security and national economic resilience. Clearly few countries will have the capacity to develop their own self-sufficient domestic solar industries. Nevertheless, governments will be looking for opportunities for coupling their transitions to renewables with creating green jobs. India will have to avoid the situation of ISA projects which are tied to Indian solar products, offer few local jobs, and appear to deepen dependency. In the aftermath of COVID, India may find it necessary to carefully navigate its desire for exports, against partner government's wishes for the local siting of factories and investment in domestic production. India may find it advantageous to use its leadership of the ISA to encourage greater international collaboration not just on accelerating solar installation, but also on promoting more geographically diversified production networks for solar cells, modules, and associated materials and components. •



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