

# *Strategic Deployment of Renewables through Climate Diplomacy*

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## **Introduction**

Energy security is one of India's core, national priorities. In fact, this is one component that has been identified and recognised officially as a "national security issue". The former Union Minister of State (Independent Charge) for Power, Coal, New & Renewable Energy and Mines, Piyush Goyal acknowledged



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that national security encompasses energy security and that “social security is incomplete without energy security.” His statement points towards the need for India, as a country to be self-sufficient in terms of its energy requirements, considering that it is one of the largest importers of fossil fuels, including coal, oil and natural gas; and consequently reduce its dependence on these imports. Within the Indian establishment, there is a greater awareness of the fact that dependence on energy supplies from various parts of the world in an increasingly politically and economically volatile world could have negative repercussions on the country’s energy security in the long term. At the same time, energy access for all, in a country where nearly 400 million people do not have access to electricity, is a goal that remains unmet, but could well be achieved if the current policies aimed at rural electrification, clean energy revolution and energy management/efficiency are strengthened and implemented effectively. In addition to these challenges, India is also committed to take steps under and beyond the Paris Agreement on climate change, signed in 2015 and ratified by India in 2016, towards mitigation, especially in the energy sector by focussing on reducing greenhouse gas (GHG) emissions through large-scale development and deployment of renewable energy within the country.

It is in this context that the Prime Minister Narendra Modi-led National Democratic Alliance (NDA) government has asserted its commitment to not only address climate change and energy security challenges at the national level but also work with the rest of the international community towards the implementation of the Paris Agreement through climate diplomacy. India’s Nationally Determined Contributions – defined as “efforts by each country to reduce national emissions and adapt to the impacts of climate change” – are a reflection of its energy security imperatives as well as that of its efforts to tackle climate changes in cooperation with the developed, other developing and under developed countries of the world. In addition, Prime Minister Modi’s foreign visits have also highlighted the close linkages between its energy and climate goals, with the signing of several bilateral and multilateral agreements encompassing promotion of renewable energy.

This article has attempted to analyse the Indian establishment’s reinvigorated renewable energy strategy, with a special focus on the climate diplomacy efforts of the current Government under Prime Minister Modi. It has also tried to throw light on the rationale for the Indian establishment’s push for clean energy in the national and global contexts i.e., setting in motion an energy revolution that Prime Minister Modi terms, “saffron revolution”. This article goes a step further and cites the cases of the International Solar Alliance and Indo-German cooperation as examples of India’s successful climate diplomacy, based on a

pragmatic and result-oriented approach, working towards common goals and co-benefits. Although clean energy includes nuclear energy (as emphasised by the Government of India as well), this article has specifically dealt with issues surrounding renewable energy only, with greater focus on solar energy and the electricity sector (with a few references to other sectors and renewable sources of energy).

### **The Status of Renewable Energy in India's Energy Mix**

India's energy policy is based on four pillars – “access at affordable prices, improved security and independence, greater sustainability and economic growth,” according to the Draft National Energy Policy, released by Niti Aayog in 2017. The primary aim of this four-pillared strategy is to reduce energy consumption drastically by 2047 through energy efficiency and conservation. Within this strategy, renewable energy occupies the prime position as evidenced by several ambitious goals set by the Government of India (GoI) – one of them being the 175 gigawatt (GW) renewable energy, installed capacity target by 2022 and the other being the pledge to derive “at least 40 per cent of its energy needs from renewable sources by 2030.” As of October 2017 (data released by the Ministry of New and Renewable Energy and Ministry of Power), India's overall installed capacity stands at 3,31,118 megawatt (MW); and the renewable installed capacity (grid interactive power) has reached 60,985.21 MW, which accounts for 18.42 per cent of the total energy mix. Among the renewable energy sources, wind accounts for 53.6 per cent of the renewable energy installed capacity (32,715.37 MW), and solar, 25.5 per cent (15,574.71 MW). It must be noted here that out of 175 GW (renewable target for 2022), 100 GW alone has been proposed to be sourced from solar, 60 GW from wind, 10 GW from biomass and 5 GW from hydel.

To a large extent, the policy establishment has given priority to energy efficiency over renewable energy generation due to the fact that renewable energy may be sustainable, but may not be the best option when it comes to ensuring energy access at affordable prices. The GoI is also grappling with the challenge of grid integration of renewable electricity, taking into consideration the “predictability/uncertainty” and “variability” associated with renewable energy generation. Technically, the Indian grid system will have to be overhauled with major changes like upgradation of grid technology along with grid operation protocols and grid planning practices, and expansion of “balancing areas” among others. Administratively too, the implementation of these measures will require cooperation and coordination between various ministries and agencies like the Ministry of New and Renewable Energy (MNRE), Ministry of Power (that owns

the grid), Central Electricity Regulatory Commission (that issues regulations for grid integration) as well as State Governments.

Since the GoI's goal has been to harmonise all the four pillars mentioned earlier, energy efficiency – defined in simple terms as “achieving the same services with less energy” – fits the criteria best. As a matter of fact, one of most oft-quoted slogans by the current Government's office holders is – “Generate More, Use Rationally, Waste Less.” This is however, gradually changing as solar power tariffs have reduced considerably. In May 2017, when the solar power tariff was recorded lower than that of coal-fired power (2.44 Indian Rupees per kilowatt-hour) at an auction to supply 500 MW of a new solar capacity in Rajasthan, the mood was upbeat and more optimistic than ever. While the cost of thermal power generation stands at 3.20 Indian Rupees per unit; that of nuclear power generation is 3 Indian Rupees per unit. If India's solar energy sector grows at this rate, its dependence on coal-fired power plants could decrease dramatically in another decade or so, considering the estimation that solar energy accounts for 62 per cent of India's total renewable energy potential. India is currently the fourth largest market for solar power in the world behind China, the United States and Japan; and it is now touted to strip Japan of its third position. The GoI has also rolled out a series of policies that are directed at reducing the energy intensity of India's cities, transport and infrastructure. The Green Energy Corridors, the National Smart Grid Mission and the Smart Cities Mission among others, are aimed at increasing the country's “energy capacities from wind and waste conversion” as well as making cities more energy-efficient, and resilient to disasters and climate change.

### **India's Climate Diplomacy Positions Tied to its Energy Goals**

India's climate goals are closely tied to its energy goals, and vice-versa. Before the Paris Climate Summit (twenty-first Conference of Parties or COP-21) in 2015, Prime Minister Narendra Modi expressed his interest in not only addressing climate change and energy security problems at the national level but also the GoI's willingness to work with the rest of the international community on reaching a consensus at the Paris Climate Summit by declaring, “India will set the agenda for the upcoming Conference of Parties.” Modi's rhetoric prior to COP-21 on climate change laid the foundation for India's negotiation strategy – not to focus entirely on GHG emissions reduction, but to push forth the agenda on ‘clean energy’ at the international level. This is an issue he has been raising with world leaders during almost all his foreign visits (both bilateral and multilateral). In order to bind energy security further with the climate change debate, Prime Minister Modi has reiterated his proposal to

replace ‘carbon credit’ with ‘green credit’ so that green/clean energy initiatives are given a priority in the international climate change negotiations. He has also repeatedly underscored the need for other developed countries to lend a helping hand to India in advancing its clean energy goals that it has set in its Intended Nationally Determined Contributions (INDC) (now NDC).

Solar energy forms the bedrock of India’s climate as well as energy diplomacy and presently, the GoI pegs the requirement for investments in this sector at more than US\$100 billion in order to raise the proportion of solar power in the country’s energy mix to 10 per cent. Earlier, the GoI had set the same investment target for all types of renewable energy, but after making the pledge to increase the country’s solar installed capacity target to 100 GW by 2022 in its INDC, it revised its investment targets accordingly. Prime Minister Modi has been industriously inviting investments from companies of China, France, Japan, Germany, Canada, the US and other countries. During his visit to Germany, France and Canada in 2015 (his first visit to these countries), he was able to get Germany to agree to support development of comprehensive solar rooftop and green energy corridor projects in India through technical and financial assistance; French firms that were already involved in producing 10 per cent of the solar electricity output in India, resolved to generate 8-10 GW of solar power by 2020-2022 in the country; solar deals accounted for “63 per cent of the value of the agreements” between India and Canada, amounting to more than US\$1 billion.

Way before COP-21, India had already laid the groundwork for the International Solar Alliance (ISA), seeking to bring together the world’s solar-power rich countries by working closely with the World Economic Forum and the Indian Renewable Energy Development Agency Limited (IREDA). The ISA was launched during the Paris Summit in 2015 by Prime Minister Modi and French President Emmanuel Macron. The primary objective of the alliance has been to increase investments in solar sector as well as aid advancement of cooperation in research, development and implementation of solar technologies and equipment to increase energy access and availability (especially targeted at the most backward regions of the world and poor sections of the society). It became a legal entity on 6 December 2017 (with 46 signatories to its framework agreement and 19 ratifications), and under this alliance, by 2030, 1,000 GW of solar power is touted to be installed worldwide, which will entail 1,200 billion Euros. Next on ISA’s agenda is to develop an insurance scheme – “Common Risk Mitigating Mechanism” – in order to protect the interests of investors and create an investor-friendly environment for uninterrupted investments in the solar sector.

It is a noteworthy fact that the ISA is the first “treaty-based international government organisation to be based in India” (located in the campus of the National Institute of Solar Energy, Gurugram, Haryana). This is also a sign of India’s increasing status in the global order, whereby India is increasingly seen as playing the role of a “bridging” nation – seeking to bridge “the many nations across the world” and to bridge “development with climate action”. India has been branded a “spoiler” on more than one occasion at various international forums, including the United Nations Framework Convention on Climate Change (UNFCCC). Several statements and initiatives of the current Government cannot be seen as a radical shift from India’s longstanding foreign policy positioning with respect to climate diplomacy, but at the same time it also cannot be denied that there has been a visible shift in India’s climate diplomacy under the leadership of Prime Minister Modi, bringing about India’s projection as a part of the solution rather than the problem in the global climate governance. This is the reason why, after US President Donald Trump’s announcement to withdraw from the Paris Agreement, India has been seen as a responsible player, repeatedly concurring with the agreement (in fact, vowing to “go above and beyond the Paris accord to combat climate change”), and ready to form collective leadership with other major players like the European Union (EU) and China in advancing the Paris Agreement’s goals.

The US President Trump, while announcing USA’s withdrawal from the Paris Agreement, rationalised his decision by pointing a finger at two countries mainly, which according to him, would gain most out of the agreement, at the cost of the US – namely, India and China. He accused these two countries of continuing to pollute the atmosphere through coal-fired power plants while the US would be forced to apply brakes over its coal production and consumption. India has faced flak over its plans to double coal output by 2020, which is seen as a contravention of its climate goals, as cited in the treatise. One must keep in mind that almost all countries are still struggling with the ‘coal problem’. At COP-23 (Bonn Summit) that took place in November 2017, the “Powering Past Coal Alliance” was unveiled under which many countries including the United Kingdom (UK) and Canada pledged to phase out coal power by 2030. Notably, Germany, a country that has been championing the cause of climate action, chose to stay out of the alliance, at least for now. Other countries like the US and China are equally ‘addicted’ to coal, whether it is in their own territory or in terms of investing in coal-fired power projects outside its territory (as has been seen in China’s case). India is in no position to phase out or even commit to phase out coal power completely in the near future. The GoI reiterates that coal is not India’s “default option”, and that it is rather an unavoidable option that

has to be used in order to meet the growing energy requirements of a growing economy, coupled with that of an increasing population with rising demands for improved lifestyle – which cannot be met by tapping only renewable sources. Through climate diplomacy, India has been able to iron out differences on many aspects, including its coal dependence.

India's climate diplomacy towards the rest of the world is centred on practical goals in terms of technology and finance, aimed at achieving the targets set in the international climate agreements. This can be seen in the way increasing number of agreements are being signed between India and other countries that acknowledge the former's twin goals of climate mitigation and energy security. Take for instance, Germany, which is one of India's largest strategic partners, especially in the field of renewable energy. During the German Chancellor, Angela Merkel's 2015 visit to India, the two agreed on the Indo-Germany Climate and 'Renewables' Alliance, and the latter pledged US\$2.25 billion for India's Green Energy Corridor and solar projects. One of the major highlights of the meeting was the emphasis laid on making affordable, clean and renewable energy accessible to all by harnessing technology, innovation and finance. Germany's keen interest in "exploring and developing rural areas" (in terms of energy access) has led to deeper and more meaningful cooperation between the two countries, in line with India's ground realities. In addition to investments in the clean energy sector, Germany has expressed its willingness to test its teeth into joint research on clean energy and energy efficiency as well, which is a long-term strategy that the two countries have to work upon.

The launch of the Indo-German Working Group on Climate Change under the Indo-German Environment Forum and the Indo-German Solar Partnership in 2015, that of cooperation on Green Energy Corridors in 2013 and other initiatives indicate the two countries' efforts to bolster bilateral climate diplomacy that translates into effective steps for negotiating a treaty at the international level involving more or all countries. In May 2017, when Prime Minister Modi travelled to Germany, the two leaders reiterated their support to the Paris Agreement, in the wake of President Trump's wavering stance on it, by giving their full-fledged support to the Indo-German Climate and Renewables Alliance – "an overarching alliance between India and Germany with the objective to give recognition to ongoing collaboration of various stakeholders on energy and climate change as well as to enhance cooperation and synergies in these fields." In fact, under this alliance, both countries also aspire to undertake trilateral assistance programmes that engender collaborations between the Indo-German duo and another country (possibly a developing country) requiring assistance in climate and solar technology applications or equipment.

## **The Road Ahead for India's Renewable Energy Strategy**

While there are many negatives associated with renewable energy, one positive aspect that renders it highly effective and viable is its ability to act as an alternative to grid-based solutions or even supplement grid-based power. All over the world, investments in decentralised systems, especially in those areas where grid-based power is financially and logistically not viable, have seen an upward trend. Solar street lighting systems, solar water heating systems, wind pumps, micro-hydel plants and other renewable energy technologies are being used not only in rural or remote areas, but also in urban and semi-urban areas. Moreover, in a country like India, where land acquisition continues to be a quagmire, large-scale renewable energy projects (for instance, the proposed ultra-mega size solar parks which require up to 500,000 acres of land) might face significant delays. While the GoI is still focussed on developing and maintaining a fully functional national grid, the reality is that national programmes like the rural electrification scheme could materialise to a large extent only through decentralised systems, at least in the short term.

As per the Power Ministry's Grameen Vidyutikaran (GARV) website, as of June 2017, out of the 18,452 villages, 15,318 villages have been electrified (83 per cent) but only 8 per cent of the villages have 100 per cent household connectivity and Distribution Transformer (DT) capacity has been created in 46 per cent of the villages only. A village is considered "electrified" if the basic infrastructure (distribution transformers and lines) is set up, even while real electricity connection or supply is not provided to the households. Also, if the public places in the village and 10 per cent of its households have electricity access, it is deemed electrified. Therefore, with these definitions, the objective of 100 per cent electrification for all, wherein uninterrupted power supply is assured to all the households as well as different sectors that contribute to the growing economy will certainly be difficult to achieve. This can however be addressed through large-scale deployment of decentralised renewable energy systems to some extent. As far as grid-based renewable energy solutions are concerned, the GoI seeks an intermittency factor associated with renewable energy supply through integration with gas based power plants (much cleaner than coal) and deployment of efficient storage technologies. Since India is richly endowed with resources like solar and wind, it clearly needs to harness them in every possible way, aligning both energy and environmental concerns and imperatives.

In the current government's flagship programme on "Make in India", renewable energy features prominently. This is aimed at boosting the renewable energy manufacturing sector in the country that is at a very nascent stage

currently. In fact, investments are gradually flowing into this sector that could pave India's way to becoming a global hub for manufacturing of renewable energy equipment. In 2015, when SBG Cleantech Ltd. was formed by (i) Japan's SoftBank, (ii) India's Bharti Enterprises and (iii) Taiwan's Foxconn Technology Group, with plans to invest about US\$20 billion for generating 20,000 MW of solar power and manufacturing solar power equipment in India in the next ten years, SoftBank's CEO observed, "I want to make my commitment to endorse your Prime Minister Modi's vision to make India a centre of solar generation and equipment manufacture." For such consortiums and other projects to bear fruit, not only does the GoI need to remove barriers like red tape for renewable energy companies to enter the Indian market, but also address problems of land acquisition, which has proven to be extremely time-consuming in the country. The existing conflict between agriculture and industry over land and water resources plays into the land conundrum that India confronts. Although the GoI has laid down the guidelines for the use of uncultivable, barren land for solar park projects with minimal use of private land and smaller projects in the case of states with miniscule non-agricultural land, land acquisition could become a problem in the future for renewable energy projects in general. Reports have suggested that agricultural lands have also been diverted to establish some of the initial renewable energy projects under the Jawaharlal Nehru National Solar Mission (JNSM) by State Governments, at times due to distress sales by farmers.

Another major factor is that even when wasteland is available, it is often not close to urban areas where the demand for electricity is most and/or to the power transmission grids and/or is not connected by roads, and hence it would most likely turn out to be unviable for the administration, as the cost of connectivity to the power grids and transmission losses would escalate. In order to reduce the pressure on land to some extent, the GoI has decided to invest in off-grid rooftops and generate at least 40 per cent of India's 100 GW solar target from them. Similarly, the Government is also keen on investing in canal-top and canal-bank solar power projects. India is the first country to build one – 10 MW plant built over a 3.6-kilometre stretch of the Sardar Sarovar Canal System in Gujarat – a model now being emulated by other Indian states. However, solar parks have proven to be more feasible in comparison to rooftop solar due to administrative costs (like ensuring that there are at least 500 consumers on an average), because of which only 823.64 MW of rooftop solar power plants have been installed as of October 2017.

What India needs to also focus on, is providing additional impetus to the ongoing Research and Development (R&D) in the material sciences, which would make a gradual shift from expensive silicon-based solar cells to frugal

alternatives like perovskite possible. On the one hand, greater advancements in solar technologies can reduce the required amount of land for renewable energy projects. On the other, India cannot afford to lose out to its competitors due to infringement of Intellectual Property Rights (IPR). Even though climate diplomacy has matured to produce constructive results in many instances, as mentioned earlier, in others, technology transfer is still being hampered by IPR constraints. In 2015, the World Trade Organisation ruled in favour of the US when the latter approached the former to challenge India on its domestic content requirements adopted in solar cells and modules, without paying for the technology. India has, for a long time, called for the provision of renewable and other climate-friendly technologies, with the IPR protection costs to be borne by the Green Climate Fund (GCF). In fact, in its INDC, India has specified that it would require at least US\$ 2.5 trillion at current prices to implement climate actions outlined in it; and for this India has urged developed countries to finance the GCF adequately. Such barriers could come in the way of India's ambitious goals as well and therefore, it needs to step up its R&D in this field.

Besides, India's over-dependence on solar panels, especially from countries like China, is a hurdle that India is yet to address. According to one report, India imports more than 85 per cent of its solar energy equipment from China; and this has put the domestic solar equipment manufacturers at a disadvantage, since they face stiff competition from Chinese and other manufacturers. At the same time, by August 2017, the price of Chinese solar panels rose by 20 per cent (due to the push for imposing anti-dumping duty on cheaper imports from China in the US and China's decision to extend its feed-in tariff regime). This could have negative repercussions for solar power tariffs as well; and more importantly on the Indian projects in which the producers quoted lower tariffs in 2017. If the GoI is looking to reduce the country's dependence on energy imports by promoting renewable energy, it also needs to give equal attention to R&D in the renewable energy equipment in the country so that global price fluctuations, geopolitics or other concerns do not come in the way of maintaining long-term energy security.

India's push for renewable energy is also partially driven by the pressing demand for tackling the increasing levels of air pollution in the country. According to a study by the World Health Organization (WHO) in 2015, 13 of the total 20-most polluted cities are in India. Air pollution has emerged as one of the biggest health risks that India faces currently. Another study by the Lancet Commission on Pollution and Health reveals that at least 2.5 million people died early because of pollution in the country in 2015, which is more than any other country in the world. In fact, this is causing reverse migration in the country,

with many people now opting to move out of cities and settling in rural areas. China too is said to have started taking climate change seriously in the wake of alarmingly high levels of pollution in its major cities like Beijing, resulting in socio-economic losses to the tune of 1.1 trillion Yuan (as recorded in 2010). Like China, India is also slowly waking up to the evolving catastrophe that has engulfed its cities and impacted not only human lives but is also affecting the national economy in general.

Environmental protection, conservation and preservation are not new to Indian ethos. Of course, actions speak louder than words. And this is the right time to ensure that the rich environmental history of India is preserved through environmental actions that do not necessarily pose any risk to the government's obligation to provide electricity, shelter and other amenities to a large section of the country's population that still does not have access to them. After all, India's policy of environmental protection is driven by livelihood as well as other socio-economic concerns, which cannot be seen independently from one another. If there is one country that stands the best chance to take the moral high ground on climate and environmental issues from a historical, and even futuristic, point of view, it is India. In comparison to the developed nations, India's per capita emissions are much lower (albeit it is the world's third largest



GHG emitter). Moreover, India's economic growth story is defined by the services and not manufacturing. In essence, India had skipped the industrialisation phase (the Industrial Revolution) that spurred West's unhindered development – defined by high energy consumption that continues to be the case – and also contributed most (single-handedly) to climate change and environmental degradation in general world over. Once environmental degradation reached its peak (and perhaps even crossed the threshold) in the West, it was then conveniently relocated to Third World countries (including India) by shifting manufacturing and assembling industries to the latter, heavily influencing their energy consumption patterns. This is the right time for India to plunge into the international arena as not only a responsible player but also an agenda-setter and more importantly, an agenda-mover, in terms of ensuring access to sustainable and clean energy for all.