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# MAUSAM

.... talking climate in public space



## Editorial

This fifth issue of *Mausam* focuses on India's Intended Nationally Determined Contribution (INDC) submitted to the UN Climate Convention in early October. We think it was not nationally determined, however. Nor does it contribute in any way towards solving the climate crisis: if anything, it can only help worsen the crisis.

It was not 'nationally determined' because there was little or no discussion in the public domain before its submission to the UNFCCC. For such an important document touching upon a number of crucial areas of public policy, a draft should have been introduced and discussed thoroughly in Parliament. The government should have asked for inputs and feedback on a publicly circulated draft should from citizens, people's organizations and unions, along with other informed opinion. Nothing of the kind happened.

The importance of other areas notwithstanding, the most crucial aspect of climate policy is mitigation, which hinges on the extent of carbon emissions, and its control. At the centre of India's INDC is the proclamation that India intends "to reduce the emissions intensity of its GDP by 33-35 per cent by 2030 from 2005 levels". That is, the volume of carbon dioxide and other greenhouse gas emissions, measured as carbon dioxide-equivalent (CO<sub>2</sub>-eq), would be about one-third less for every unit of GDP. India's emissions in 2007 were about 1.9 billion tonnes. Even based on conservative estimates of GDP growth over the period 2005-2030, it implies that India's emissions in 2030 will shoot up to at least five billion tonnes of CO<sub>2</sub>-equivalent, very likely more.

The Indian government and – we are sorry to add, but not surprised – most large NGOs and policy experts justify this by saying that India needs this huge jump in emissions in order to 'develop'. Such deliberately naïve generalizations ignore that the one big generic 'India' is in reality several entities: it includes a complex, stratified society that has become more unequal over the last few years. Implicit in the pro-development/pro-emissions argument is an utterly unsupported assertion that the gains of such emissions are well distributed. Nothing can be more false: though India's electricity generation capacity has trebled over the past decade – to 2,34,000 MW by 2014 – electricity access for the poor has been limited. As one of the articles in this issue points out, 25 per cent of India's population still gets no electricity at all – 304 million people, the INDC admits – and another 25 per cent gets supply for only a very few hours a day. Which means that much of the electricity generated has only catered to elite demand. Many social indicators suggest that the lot of the poor has improved at best marginally: real wages for factory workers, after taking inflation into account, are less now than they were in 1996. Nutrition levels for small children are abysmal, poverty levels are still staggeringly steep and much higher than official estimates. At a time when the INDC and government policies are largely business-as-usual, there's no reason to believe that the poor will benefit significantly from a much higher emissions development trajectory. On the contrary, it is the underclasses that will disproportionately pay the costs of higher emissions in terms of climate impacts, as we have witnessed in the Uttarakhand disaster, in cyclones, and most of all in small agriculture in many regions. And they will pay those costs for centuries,

because of the long-lived nature of carbon dioxide in the atmosphere.

As India's GDP continues to grow, the rich become richer: according to Kotak Wealth Management, quoted in Research Unit on Political Economy's fine study of India's middle class, the number of households with a minimum net worth of Rs 250 million has been rising steadily, from 62,000 households in 2010 to 81,000 in 2011, 100,900 in 2012 and 117,000 in 2013-14. When the Indian government states in the INDC that India's per capita annual emissions is only 1.56 metric tonnes, it yet again shamefully hides behind the still vast numbers of poor people in this country, which drags down 'India's' average emissions. The INDC has the gall to say that India's per capita emissions are low "because Indians believe in nature friendly lifestyle and practices", even as elite consumption in this country continues to soar, consciously helped by government policies such as cheap flights, cheap loans for cars, elite housing, air conditioners and other white goods, etc.

A second key aspect of India's INDC is the statement that we will generate "about 40 per cent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030". Subsequent analyses have pointed out that this refers to *capacity*; actual electricity *generation* from non-fossil fuels, even if these targets are met, would be much lower, only about 21-22 per cent. Hence actual electricity generation from fossil fuels in 2030 would be nearly 80 per cent.

What's more, expanding consumption by the rich leads to indiscriminate expansion of all kinds of power generation to meet that elite demand. Articles in this issue of *Mausam* critically examine varied aspects of this generation in various sectors. Nuclear expansion is projected at 63 gigawatts by 2030. This will not just not happen, it is neither "safe and environmentally benign" as the INDC claims absurdly, nor the best route if one wants to reduce carbon emissions quickly. India already emits 1.6 billion tonnes of CO<sub>2</sub> from coal alone, and the massive planned expansion of coal production from the current 570 million tonnes to a billion tonnes each year by 2022 can only increase the emissions manifold. Surely this is not for improving access to electricity for the poor! Each tonne of coal being burnt, mind you, emits two tonnes of CO<sub>2</sub> on average. And besides its consequent long-term climate impacts, coal mining and thermal power has a range of hidden costs, such as higher emissions from deforestation and a staggering 100,000 premature deaths a year because of pollution. Every single coal-fired plant is also responsible for the extinction of a large number of species due to emissions over its lifetime.


Large hydro electricity projects, which keep on coming up all over the ecologically and geologically fragile Himalayan range, have been time and again shown to be environmentally destructive, besides being responsible for a range of social costs, borne by those displaced and affected. Even renewable sources such as wind and large solar have their social impacts arising from unjust and seldom legal takeover of people's personal or commons lands. The other huge loss of commons would arise from the third important element in the INDC, creation of a huge carbon sink in forests and new plantations capable of sequestering 100 million tonnes of CO<sub>2</sub>-eq a year. In practice, this translates into handing over forests and other commons to large private companies for raising industrial tree plantations, besides encouraging and financially strengthening a corrupt and feudal-colonial forest bureaucracy, at the cost of Indian forest communities.

Given the enormous social and ecological implications, a more democratic INDC would have paid heed to the enormous resistance to coal mining, power projects, hydro power, industrial corridors and other projects exploding in every corner of this country in recent years. We recognize that a transition away from fossil fuels cannot happen overnight, and that elements of it, mining in particular, still provides employment, however hazardous, for lakhs of working people. But that is precisely why a comprehensive dialogue about the nature, pace and route of transiting away from fossil fuels in this country is necessary and urgent. Constituent organizations and members of our collective India Climate Justice have been engaging with the issue of the energy transition as have a number of workers' union federations worldwide. India's INDC reflects none of

these concerns.

Finally, India's INDC needs to be viewed within the larger frame of ongoing climate negotiations, and what current INDCs on the table imply for the planet. As we point out in this issue, an analysis of all existing INDCs suggests that we will massively overshoot safe carbon budgets by 2030. Whether we consider the Earth's absorption capacity of greenhouse gases, or whether we consider a cumulative volume of emissions over time, the existing INDCs by the world's biggest emitters guarantee that the planet will cross dangerous levels of warming. The benchmark of 2 degrees Celsius of average warming is increasingly deemed by many respected scientists and the small island nations' bloc as too high and unsafe; even that will not be met, with the most quoted estimate saying we are on track to at least 2.7 degrees Celsius warming above pre-industrial levels. Several feedbacks in the climate system (ecosystem responses that cause further warming) such as melting Arctic ice, methane escaping from thawing permafrost, more water vapour in the atmosphere, etc have already kicked in. They will soon begin to feed on each other on a scale that will make it impossible for us to intervene. The urgency that these feedbacks demand is completely missing from India's INDC and from the INDCs of most other large emissions countries. Clearly, the only way that governments can be pushed to act with greater urgency is from stronger, wider and sustained resistance by people's movements, at all levels, and by effectively linking anti-capitalist struggles with those of climate justice. Only an entrenched resistance to capitalism can offer us hope, not the INDC kind of game the governments and corporations love to play.

**(The text of INDC is available for download and can be found at:**  
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>  
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>)



## India's INDC: Climate-threatening coal continues to call the shots

Before examining India's INDC - which was submitted on 2 October, the birth anniversary of Mahatma Gandhi (and the International Day of Non-violence), it will be prudent to take a brief look back at the how INDCs themselves came to be accepted as the primary climate plans globally.

Back in 1997, when the Kyoto Protocol, the first international agreement to tackle the threat of climate change was formulated, the idea was that each of the 37 rich (Annex 1) countries that contributed the most to cumulative carbon dioxide emissions, would have a "legally binding commitment" to reduce a given percentage of their greenhouse gases from 1990 levels within a given period (2008 to 2012), called the "first commitment period". The idea also was that these reduction percentages would increase in the second commitment period, and so on. In the hugely hyped Copenhagen climate summit (Conference of Parties no. 15 or CoP-15), the rich countries mounted pressure on "emerging economies" to join the mitigation (emission reduction) efforts. The until-then sacrosanct and accepted principle of Common but Differentiated Responsibilities based on Respective Capacities (CBDR-RC, meaning those who have caused more emissions problem and have more economic capacity will contribute more to the solution) was effectively thrown out. The new norm, accepted in the next CoP (CoP-16 in Cancun, Mexico 2010), was "Pledge and Review", meaning each country would have to pledge certain emissions reduction from their baseline emissions (or emissions projection for major developing countries). These would be reviewed by a mechanism (MRV) in the United Nations Framework Convention on Climate Change (UNFCCC) for their cumulative adequacy in keeping the global atmospheric CO<sub>2</sub>-equivalent concentration within 450 ppmv (parts per million by volume) and the global annual average temperature rise within 2 degrees Celsius above pre-industrial times. But the UN member country governments found even that unacceptably 'strong', and by the time climate negotiations reached Warsaw during CoP-19 in 2013, the new norm was diluted even further to Intended Nationally Determined Contributions (INDC)! Perhaps in a few years the governments will find even these as unacceptable and will turn to 'Tentative Intended NDC' or 'TINDC'!

Thus, while the total greenhouse gas emissions increased from around 33 billion tonnes (Gt) of carbon dioxide equivalent (CO<sub>2</sub>e) in 1990 to about 53 Gt in 2013, the mitigation action continuously got less stringent and smaller, sliding from legally binding commitments through pledges to intended contributions! In between, the United Nations Environment Programme (UNEP) has been publishing Emission Gap Reports, highlighting the huge gap between the amount of emission reduction needed to keep the temperature rise within 2 degrees C and that being offered by the governments. Even the proposal that these INDCs be evaluated by the UNFCCC and contributions enhanced accordingly, has not been accepted, with only a token review by UNFCCC now targeted. The Intergovernmental Panel on Climate Change (IPCC) calculated in its 5<sup>th</sup> Assessment Report, that for a reasonable chance of global average temperature remaining within 2 C above pre-industrial levels, total global emissions must peak by 2020 at

no more than 44 GT, and then drastically reduce by over 80 per cent from 1990 levels by the year 2050. A quick analysis of 127-odd INDCs submitted by early October shows that the 2020 emissions will be close to 60 billion tonnes, way over the 44 Gt target, even if nations meet their INDC pledges. And the very acceptance that each nation will ‘freely’ decide, based on national circumstances, what their contributions will be (without a care for what happens to the global climate as a result), and even these are only ‘intended’, clearly shows that there is a huge farce being played on the world’s most vulnerable people and countries. Paris is going to host the 21<sup>st</sup> CoP, from 30 November to 11 December 2015, and announce the “great achievement” of a new “universal climate treaty”. Even this pathetically inadequate ‘treaty’, or ‘an outcome with a legal force’ will be coming into effect only by 2020, and by that time emissions will be nearly 60 Gt. In reality, the world will be committed to great climate chaos in decades to come. This is the real nature and value of the INDCs.

Let us focus on the Indian INDC and a few of its stand-out features. One, it categorically refuses to commit to any peak emission level, unlike most other major economies. Several studies have projected the India’s gross emissions to reach anywhere between 4 and 7 billion tonnes by 2030, and a more realistic figure is around 5 Gt. Second, it also refuses to commit to any year by which its emissions will peak and then start falling, essentially saying our emissions will keep growing. While claiming that “few countries in the world are as vulnerable to the effects of climate change as India is with its vast population that is dependent on the growth of its agrarian economy, its expansive coastal areas and the Himalayan region and islands”, India’s INDC says we will continue to emit more climate-threatening CO<sub>2</sub>, by burning more CO<sub>2</sub>-intensive coal! When your actions do not match your positioning, it’s called hypocrisy. But if one asks – is India’s INDC good, bad or ugly? The answer would be – it depends how you look at it. If one compares India’s INDC with others, no one is good, so in comparison, India’s seems not-so-bad. But surely it is blind, stubbornly pro-dirty-industry and somewhat stupid.

### **Huge Expansion of Coal**

India’s INDC claims that coal is necessary for uplifting “the largest proportion of global poor (30%), around 24% of the global population without access to electricity (304 million), about 30% of the global population relying on solid biomass for cooking and 92 million without access to safe drinking water”. The reality is that from 1991 to 2011, India increased its centralised installed power capacity by three times (from around 63,000 MW to 187,000 MW), while merely reducing the number of unserved/ unconnected



Open Cast Coal Mine Photo: Soumya Dutta



Photo: Soumya Dutta

Tata Mundra power plant in the background, coal dust and fly ash contaminates drying

population from 54 per cent to around 25 per cent, while another 25 per cent gets coal power in nominal quantities, of a few hours of electricity each day. This shows that centralised big power is really not being used for the stated purpose. A simultaneous rise in per capita emissions (from 0.79 T/person/year in 1990 to nearly 1.9 tons/person/year in 2014) and large rise in total coal consumption (from 249 million tons in 1990 to 745 MT in 2014) shows that these three times per person rise in coal consumption and 2.5 times in carbon emissions are serving only the well-off (as the poor are often not connected to the coal power grid, or get only a few hours of coal-produced electricity per day). And the other claims of coal's benefit, such as providing clean drinking water to 92 million without that access, ignores the fact that coal mining and burning is consuming and contaminating massive amounts of freshwater, denying the same poor their traditionally available natural drinking water sources.

India's INDC looks at coal as the continued major energy source and still claims good climate action. The world today consumes about 7,800 million tonnes of coal each year, and combined with about 3,995 million tonnes of oil (all petroleum products) consumed every year, these two (along with gas, the third largest) are by far the primary contributor to CO<sub>2</sub> emissions. In the year 2012, coal, oil and gas contributed roughly 43%, 33% and 18% of global CO<sub>2</sub> emissions (Global Carbon Project data), adding up to 94% of the total. Thus, any meaningful climate mitigation action has to reduce these carbon-intensive fuels drastically. And out of these three, coal is the most CO<sub>2</sub> emission intensive, as it contains little more than half of the energy per tonne compared to oil, which is a hydrocarbon (getting energy from burning both carbon and hydrogen, in contrast to coal getting its energy from burning mostly carbon). So it makes eminent sense that climate action has to target reduction in overall coal use.

In sync with its claim in the INDC that coal will remain the mainstay of energy in India for decades to come, the Modi government seems to be far more committed to increasing coal production by dismantling most environmental and social regulatory frameworks and pushing aside environmental laws and concerns. The current domestic coal production of about 570 million tonnes (from all sources) is targeted to be raised to 1 billion tonnes by around 2020. Soon after this announcement, a further enhanced target of 1.5 billion tonnes was announced. Considering the import of around 200 million tonnes in 2014-15, the domestic consumption in 2014-15 would be around 770 mt, and the CO<sub>2</sub> emission from burning this alone close to 1.6 billion tonnes (considering higher ash content in Indian coal, and also taking into account lignite-burning, a lower conversion factor of 2.0 is used)!

Another large hidden emission rise from increased coal production is from large-scale deforestation. Most of the new coal mine areas in India have thick forest cover, like the hugely contested coal mining (and won by grassroots resistance to the mine) in Mahan forest/coal block in Singrauli district of Madhya Pradesh. As tens of thousands hectares of good forest land is targeted to be mined for coal, emissions from deforestation is sure to rise sharply.

India's INDC claims – "*Coal based power as of now accounts for about 60.8% (167.2 GW) of India's installed capacity. In order to secure reliable, adequate and affordable supply of electricity, coal will continue to dominate power generation in future*". That means India will continue to use the most CO<sub>2</sub>-emission intensive source as its biggest energy source, to 2030 and beyond! Most of India's older coal power plants are very inefficient, with an average coal to electricity energy efficiency of less than 30%. Only a few recent super-critical boiler based plants have a somewhat higher 37-38% coal-to-electricity efficiency that they claim. On top of that, because all of these are large centralised plants located far from the load centres, about 24 per cent of the generated power is lost in transit (called AT&C loss). Thus India's centralised coal power infrastructure gets only about 23% of the energy in the coal burned to user points. The rest adds to wasteful carbon emissions serving no one. Even if all the new big coal plants use super critical technology, as the INDC claims, and these work at 37% efficiency, and the national AT&C losses are brought down to 20% (a lot of long pending asks), the coal-to-user-point-electricity efficiency will still be a low 29.6%, with over 70% of the burned coal wastefully adding climate-threatening CO<sub>2</sub>.

The INDC also claims that the Rs 200 per tonne of coal cess is a great carbon tax mechanism, "*The coal cess translates into a carbon tax equivalent, using the emission factor for coal, of around USD 2 per tonne*". One needs to recall that during the heyday of carbon credits through CDM (Clean Development Mechanism), the price per tonne of CO<sub>2</sub> reduced was over USD 20, and even that was not enough for reducing emissions from polluting entities.

The other large coal consumers are steel and cement production, and if the INDC's target of reduction of emission intensity by 33-35% is achieved, this will be reducing coal consumption and emission growth in these industries (cement industry has another, inherent CO<sub>2</sub> emission mechanism, from its production itself, using whatever energy source). INDC claims that India has already improved its economy wide energy intensity by 12% from 2005 to 2012, and this is a remarkable achievement. Even so, there are a large number of both supply side and demand side reduction opportunities, and if pursued with even these not-so-aggressive targets of 33-35%, the coal consumption growth in many industrial activities will come down.

India's dogged defence of its unbridled right to more carbon space (also termed 'development space', as if 'development' is synonymous with burning carbon), to economic growth, has created this stubborn 'national' stand that we cannot accept any limit on coal burning. The government thinks it's essential to consume very high carbon-based energy to achieve a high Human Development Index. As the INDC says, India's present per capita energy consumption is 'only' about 0.6 tons/person/year (2011) and – "It may also be noted that no country in the world has been able to achieve a Human Development Index of 0.9 or more without an annual energy availability of at least 4 toe per capita. With a HDI of 0.586 and global rank of 135, India has a lot to do to provide a dignified life to its population and meet their rightful aspirations." Does this hypothesis stand the test of reality? Even in our own neighbourhood, Sri Lanka, with a per capita CO<sub>2</sub> emission of about 0.83 T/person/year, less than half India's, has achieved a much higher HDI of 0.75 compared to India's 0.586. Maldives HDI of 0.698 is also much higher than India's with far lesser CO<sub>2</sub> emission per person. Bangladesh emits 1/4<sup>th</sup> our per capita CO<sub>2</sub>, and has a HDI close to India's, at 0.558. So that argument falls flat.

The other major reality that the INDC – in stubbornly pushing coal as salvation logic - fails to internalize is that coal burning has huge external costs, over and above climate change impacts. Some estimates show increased premature deaths of over 100,000 per year, with increased disease burdens an extra. If we include coal's adverse impacts on health, agriculture, water resources, air quality, soil pollution etc, the development / HDI rhetoric seems very hollow.

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### **(Endnotes)**

The frequently made comparison between India and China is not really fair. About this, the Indian government's claim is valid: that you cannot put a USD 2 trillion economy with roughly 2 tonnes CO<sub>2</sub> per capita per year emitting approximately 7% of global CO<sub>2</sub> and a USD 10 trillion economy with roughly 8.4 Tons per capita emission emitting 29% of global emissions– in the same category, while the population of the two countries are fairly close at 1,270 million and 1,360 million. China's clever positioning of 2030 or earlier as its peaking year of emissions has put pressure on other major/ emerging economies to follow suit.



## Nuclear Power as Intended Nationally Determined Contribution

India's Intended Nationally Determined Contribution document (INDC) mentions nuclear power twice. On page 10, it says: "India is promoting nuclear power as a safe, environmentally benign and economically viable source to meet the increasing electricity needs of the country. With a 2.2% share in current installed capacity, total installed capacity of nuclear power in operation is 5780 MW.

Additionally six reactors with an installed capacity of 4300 MW are at different stages of commissioning and construction. Efforts are being made to achieve 63 GW [gigawatts] installed capacity by the year 2032, if supply of fuel is ensured." And then on page 38, there is a listing of nuclear and other technologies.

Before analyzing the projection itself, it is worth pointing to two sour ironies involved in talking about an over ten-fold expansion of nuclear power. First, the document was released on Gandhi Jayanti and the Mahatma would have almost definitely disapproved of this emphasis on a technology that is so closely related to a weapon of mass destruction. The second irony about the document's vision for nuclear power is that it starts with a hymn from the Yajur Veda that talks about peace.

Coming to the projection itself, the origin of the 63 GW figure goes back to the 2006 report by the Expert Committee on Integrated Energy Policy of the Planning Commission. The report posited a scenario that envisions "a capacity addition of 63,000 MW from nuclear power sources" by 2031-32 but warns that the assumption "may not be fully realised" (Planning Commission 2006: 22). That warning is entirely justified, but it is essentially that projection that has been fished out in the INDC.

The fraction of nuclear power in India's installed capacity (2.2 per cent) mentioned in the INDC falls entirely within the roughly 2 to 4 per cent nuclear share that has characterized India's electricity supply for about two decades. There are many reasons to expect that this fraction will not change significantly in the next decade-and-a-half.

First, the DAE has a long history of making ambitious projections, none of which have been fulfilled (Ramana 2012). In the early 1970s, for example, the DAE predicted that by 2000, there would be 43 GW of nuclear capacity. Actually installed capacity was 2.7 GW in 2000. More recently, in 2010, the DAE Secretary announced a target of 35 GW by 2020 (PTI 2010). But it is almost certain that the maximum installed nuclear capacity in 2020 will be essentially the 10,080 MW (5,780 + 4,300) mentioned in the INDC itself. The average construction time for the seven reactors that have been commissioned in India during the last decade is 7.3 years (Schneider and Froggatt 2015: 34); thus, even if new reactor construction were to commence, it would not be completed by 2020.

Second, nuclear power is a complex and difficult technology and it is not easy to develop it very rapidly. Practically each reactor built in India took longer to build, cost more than projected, and performed worse than envisaged. In most cases, these delays were due to problems that had not been envisioned when the project commenced, even though most operating reactors are of the same type — pressurized heavy water reactors based on the Canadian CANDU design — and thus benefited from standardization and experience elsewhere. The DAE's projections of rapid growth implicitly assume that all previous problems have been solved and no new problems will ever emerge. Such assumptions have

been repeatedly shown to be untenable around the world.

In the future, however, construction and operation might fare worse because India plans to import a new reactor type: light water reactors. Current plans in India envision importing at least four new kinds of light water reactors: the VVER from Russia, the EPR from France, and the ESBWR and the AP1000 from the United States of America. Apart from the fact that these are incredibly expensive compared to domestic Indian designs and would make nuclear electricity uncompetitive (Raju and Ramana 2013), a further problem is that Indian safety regulators have no experience with these designs.

We now get to the list of nuclear technologies mentioned on page 38 of the INDC, of which the only reactor type that figures prominently in Indian nuclear planning is the fast breeder reactor. Fast breeder reactors are thus termed because they are based on energetic (fast) neutrons and because they produce (breed) more fissile material than they consume. They are fuelled by plutonium and are an essential feature of the three-stage plan for nuclear power that the founder of the programme, Homi Bhabha, offered as a way to exploit India's large resources of thorium. The DAE envisions constructing literally hundreds of them over the next few decades (Grover and Chandra 2006).

In the early decades of nuclear power, many countries pursued breeder programmes, but practically all of them have given up on breeder reactors as unsafe and uneconomical (IPFM 2010). India's experience with breeders so far has been with one small pilot-scale fast breeder reactor, whose operating history has been checkered (Ramana 2009). In addition, the DAE's projections have simply not accounted properly for the future availability of the necessary fuel element: plutonium (Ramana and Suchitra 2009). It is simply impossible to produce plutonium at the rate needed to fuel all the breeder reactors the DAE wants to construct over the next two or three decades.

Finally, there has been significant opposition to every new nuclear reactor and uranium mining project that has been planned since the 1980s, most dramatically illustrated by the intense protests over the Koodankulam reactors (Kaur 2012). In addition to concerns about safety or radioactive waste, opposition to nuclear facilities also stems from their impact on lives and livelihoods. This source of opposition will likely intensify over the decades as land and other natural resources become subject to tremendous competition.



Kudankulam Power Plant Photo: Soumya Dutta

The experience in India and the world has shown that nuclear power is not the “safe, environmentally benign and economically viable source” that the INDC promotes it as. But more to the point, even if it does meet those criteria, it is unlikely to be a way to quickly reduce carbon emission levels.

### **M. V. Ramana**

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Resistance Against Nuclear Power

Photo: Soumya Dutta

## India's INDC in the water sector: Business-as-usual

No one can deny that the current Indian government is known to be strong in one aspect: symbolism. And so they released India's INDC on 2<sup>nd</sup> October (India time), Gandhiji's birthday. The opening lines of the government's public statement releasing the INDC reads: "On Gandhi Jayanti, India has submitted its Intended Nationally Determined Contribution (INDC). The approach of India's INDC has been anchored in the vision of equity inspired by the Father of our Nation. Mahatma Gandhi's famous exhortation; '*Earth has enough resources to meet people's needs, but will never have enough to satisfy people's greed*'".

India's INDC also claims, "The INDC document is prepared with a view to ... a sustainable lifestyle and climate justice to protect the poor and vulnerable from adverse impacts of climate change." But there is nothing in the entire INDC that inspires any confidence that the government indeed cares for the poor, adivasis, farmers, women, mountain people, fisherfolk or the dalits, all of who incidentally are also the most vulnerable to climate change impacts. In fact, like India's National Action Plan on Climate Change (NAPCC) of 2008, the INDC does not make any sincere attempt to even identify who are most vulnerable to climate change impacts.

The INDC, as the name suggests, was supposed to be nationally determined, but the Union Ministry of Environment, Forests and Climate Change's claim that it "adopted an inclusive process for preparation of India's INDC" notwithstanding, there was no transparent, participatory process. Unless one agrees that a handful of bureaucrats, ruling politicians and some committee members constitute the nation, it cannot be said to be nationally determined since there was no national process to determine India's intended contribution, not least involving people on the ground. In this aspect, the INDC replicates the non-transparent process with which the NAPCC and the state action plans on climate change were crafted.

The INDC also largely comprises a business-as-usual collection of plans. So much so that CAMPA money, which has been collected as compensation for deforestation (undisputedly likely to worsen the climate change), as determined by the judiciary, is now counted among the adaptation measures in INDC! Coming to the water sector, there is not a single aspect in the entire INDC that can be legitimately claimed to be in response to climate change impacts.

The INDC says that in India the "share of non-fossil fuel in the total installed capacity is projected to change from 30% in 2015 to about 40 % by 2030". The non-fossil fuel share in installed power capacity includes hydropower projects. This includes India's massive hydropower plans, as INDC says: "With a vast potential of more than 100 GW, a number of policy initiatives and actions are being undertaken to aggressively pursue development of the country's vast hydro potential." Even though it is well established how environmentally destructive and unsustainable these hydropower projects are. This was most starkly evident in the Uttarakhand flood disaster of June 2013. The *Bulletin of the American Meteorological Society*, in its annual extreme-weather report of September 2014, listed 16 extreme weather events of 2013 where the role of climate change was undeniable. The list includes the Uttarakhand disaster. Even some of India's bureaucrats, such as the secretary to the Ministry of Earth Sciences, agreed that there was undeniable climate-change footprint in this event. A Supreme Court-appointed expert committee concluded in its report submitted in April 2014 that the Uttarakhand flood disaster was worsened by existing and under-construction hydropower projects.

In 2015 itself, Maharashtra, Karnataka, Telangana, Andhra Pradesh, Gujarat and some other parts of India are facing unprecedented drought. Some of these regions also faced droughts in 2009, 2012, 2014 and crop loss due to unseasonal rains in early spring in 2014 and 2015. And even as millions of Indians, particularly the poorer sections, are repeatedly facing climate-induced disasters, the government is doing

nothing either in terms of recognising them as climate change victims or compensating them for the losses they suffer for no fault of theirs. The government is also not tailoring development plans so that the vulnerabilities of the poorer sections do not increase but actually decrease.

### **Business-as-usual programmes**

India's INDC does acknowledge this reality: "For India, adaptation is inevitable and an imperative for the development process. India is facing climate change as a real issue, which is impacting some of its key sectors like agriculture and water. The adverse impacts of climate change on the developmental prospects of the country are further amplified enormously by the existence of widespread poverty and dependence of a large proportion of the population on climate sensitive sectors for livelihood." But there is nothing in the INDC that addresses these concerns. The National Waterways Plan, National Water Mission, National Mission for Clean Ganga, National River Conservation Directorate, and other water-related claims in the INDC are either business-as-usual programmes going on for several decades or devoid of real content. So for example, the National Mission for Sustainable Agriculture is focusing on false business-driven agendas like "genotypes of crops that have enhanced CO2 fixation potential, which are less water consuming and more climate resilient", there is no priority for organic farming or water efficient techniques like System of Rice Intensification that can help reduce water consumption and yet increase yields and incomes of the farmers, and also reduce their climate change vulnerabilities.

This is apparent in the way the government is pushing large hydropower projects all across the Himalayas from Kashmir in north-west to Arunachal Pradesh and rest of North East India, large dams and river linking plans, without either properly assessing the impacts of the projects, or having a democratic decision-making process, or in any significant way involving the people of the region. India's INDC says the country is working towards "safeguarding the Himalayan glaciers and mountain ecosystem", but while there are no plans to back these words, India's hydropower agenda is working in exactly the opposite



Destruction by Large Hydro, Subansiri dam

Photo: Souparna Lahiri

direction. In the process, it is least concerned if even the protected areas get destroyed, as it happening in the case of Ken Betwa<sup>®</sup> River Linking proposal, which will destroy the Panna Tiger Reserve. Similarly, its plan to increase the height of the Sardar Sarovar Narmada Dam from 121.92 m to 138.68 m will displace over two lakh people without any proper rehabilitation<sup>®</sup>, even through there is no additional benefit from the dam.

How the current government is blind to climate change concerns<sup>®</sup> was also apparent in the way it constituted the TSR Subramanian committee and now even after a parliamentary committee rejected the committee's report, the government continues to push the recommendations of the report. As some IPCC reports have also concluded<sup>®</sup>, large dams and large hydropower projects are not climate-friendly; they in fact bring worst impacts for the poor. And yet, the current government is pushing big dams, big hydropower projects and river-linking projects vigorously.

In fact, India's water lifeline is groundwater and India needs to work to sustain that water lifeline, and such work would not need any large dams. Similarly, India's hydropower projects are not only creating the potential for greater disaster, the power generation from such projects is diminishing<sup>®</sup>.

Whereas renewable energy sources such as solar, wind, biomass and micro hydro can provide some additional power when these are implemented with consent of the local communities. Such projects can also help ensure electricity supply to those that do not have it now. However, for India's self-interest and in the interest of the welfare of India's climate change vulnerable population, we also need to reduce our resource use<sup>®</sup> and not strive to increase it any cost as India's INDC is now intending.

### **Himanshu Thakkar**

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### **End Notes**

- 1 <https://sandrp.wordpress.com/2015/10/13/sandrp-critique-of-indias-napcc-there-is-little-hope-here/>,
- 2 For example, see: <https://sandrp.wordpress.com/2014/04/08/maharashtra-state-action-plan-on-climate-change-farmers-suffer-state-and-consultant-teri-unaffected/>
- 3 <http://himalmag.com/uttarakhand-floods-disaster/>
- 4 <https://sandrp.wordpress.com/2014/04/29/report-of-expert-committee-on-uttarakhand-flood-disaster-role-of-heps-welcome-recommendations/>
- 5 <https://sandrp.wordpress.com/2013/03/30/how-is-2012-13-maharashtra-drought-worse-than-the-one-in-1972/>
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- 9 <https://sandrp.wordpress.com/2015/08/25/letter-to-moef-expert-appraisal-committee-reject-ken-betwa-proposal/>
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## India's INDC and the big push for renewable energy: A brief look

Early this month, India submitted its Intended Nationally Determined Contribution (INDC) to the UN Framework Convention on Climate Change. This is basically the conditional plan of what actions our government will take to tackle the threat of climate change. Conditional, because some actions are made contingent upon receiving international climate finance. Following the recent announcements of the NDA government, the ambition level on various “renewable energy” options have been up-scaled from those of the earlier governments. And the INDC has received a mixed response, with its renewable energy part drawing lots of praise even from the normally critical global civil society. Let's take a brief but close look at the renewable component of this INDC.

It must be understood clearly that the renewable energy applications India are pushing for are overwhelmingly for providing electricity, with few exceptions like solar water heaters and concentrated solar thermal applications, and are thus targeted to replace a small part of India's total energy basket than people realize. Even at 30% urbanization and at a per capita GDP of about USD 1,410, India consumes only about 15-16% of its total energy in the form of electricity/ power, which is a much smaller part than developed or even several developing countries. Thus, when our INDC targets having 40% of electricity from ‘renewable sources’, it is talking of getting 40% of roughly 20-24% (assuming higher levels of urbanization in 2030, from about 400 million people now to 610 million, and the higher per capita income levels then) of our total energy consumption from non-renewable to renewable sources. Or only about 8-9% of total energy basket is to be from renewables with this target – not a very ambitious figure. Out of the remaining 76-80% or so of non-electrical energy, coal-oil-gas will still provide the lion's share, along with traditional biomass, with nuclear providing only a small portion of electricity – again.

Having clarified that, it is no doubt a far more ambitious renewable target than any given so far, or even more ambitious than several other countries. And it is imperative for any safe climate goal that all nations move away from fossil carbon fuels, with the fastest shift from the most emission intensive of them all – coal. The Indian INDC does not follow that logic, saying that coal consumption will increase drastically and will remain our energy mainstay for decades more to come, thus negating the very logic of bringing in the INDCs, which are supposed to be primarily climate action pathways.

This government had earlier announced, and the INDC repeats that by 2022 itself, India will try to have an installed solar electricity capacity of 100 GW, up from today's 4 GW. It pledged installed wind power capacity of 60 GW up from today's 24 GW, and 6 GW of micro hydro from today's 4 GW and another 10 GW of biomass based power from current 4.4 GW. The total renewable power installed capacity target by 2022 would be 176,000 MW. In the operative part in page 29 of INDC, the target is put thus – “To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).” If we consider the earlier projections of around a thousand

gigawatts of total installed capacity by 2032, the 40 per cent figure indicates close to 400 GW by 2032. If we take out 63 GW of nuclear and roughly another 100 GW of big hydro (all non-fossil sources, though not renewable), we are left with a roughly 237 GW of installed renewable capacity, compared to about 37 GW today, a 6.4 fold increase in 15 years. Quite remarkable if achieved.

Now, if we take into account the 18-20% plant load factors generally achieved in wind and solar electricity plants, compared to about 70-75% in coal or nuclear power plants, the 'levelized generation capacity' of these 237 GW 'installed capacity' renewables would be equivalent to about 66 GW only, compared to about 600 GW of coal & gas based capacity then. Not a high renewable electricity generation after such an "ambitious goal" !

Now to some other problems of the way these are being implemented. With the best high efficiency (16-17% efficiency in field conditions) non-tracking solar PV panels and efficient placement, the land requirement would be two hectares per MW installed, but the kind of lower efficiency solar PV panels being used in most Indian installations and with associated facilities, the land requirement in Indian plants is about 3-4 Hectares per installed MW. If we assume that out of the 237 GW of renewables, about 150 GW will be solar by 2030-32, this entails a land requirement of 4,50,000-5,50,000 hectares (assuming only a small portion are roof-top or over built structures) or about 4,500-5,500 sq kms. This is a huge amount of land in densely populated India, and very few places in our country can afford to have large scale land based mega solar power plants, without getting into land conflict. Another conflict that is already emerging is from giving away scarce water resources in arid/ desert areas (best suited for solar PV) for washing their panels, while the local pastoralist communities are not only losing their grazing land to these solar parks, but also their only lifeline water sources in these drylands. Though there are areas like the western parts of the Thar desert or some parts of Rann of Kutchh, where the population density and intensity of other economic activity is very low, the way out would be to make the locals economically benefit from this use of their common lands. Another obvious solution is to have as much installations on built structures and multi-use facilities, like roads, canals, parking sites etc.

Wind turbines create another kind of problem, though actual land requirement is very small (many operators have actually taken far larger land – probably with future commercial interests, leading to land conflict with villagers). The low-frequency infra-sound is disturbing when other sounds die down in the



Solar Panels on Common Land

Photo: Souparna Lahiri





Land Grab by Wind Power Projects, Satara

Photo: Souparna Lahiri



Monstrous Solar Panels on Common Land

Photo: Souparna Lahiri

nights. In rural areas where good wind sites are present and wind farms are coming up, people often sleep outside during non-winter months. Complaints of continuous humming inside the head, of dull pain etc are common in these wind-farm surrounded villages, as the minimum required distance to reduce these have not been maintained. There are bitter struggles going on at this moment in Rajasthan's Jaisalmer and Jodhpur districts where villagers are strongly protesting wind turbines disturbing their sleep, and spoiling their unique tourism heritages. If solar and wind has to grow smoothly – which we need, these irritants need to be taken serious note of and rectified. With biomass, there is even more serious concerns. A large part of the poor in India used either free-collected biomass or that from the local market. If biomass is diverted to electricity generation in large scale, these poorest of Indians will suffer further energy deprivation.

In the good cause of phasing out fossil fuels, renewable energies will be our tools, but without taking these and more serious concerns, we will create new problems and crises. Ultimately, we will have to raise the question of level of energy consumption, from whatever source. Too much of even renewable energy extraction from nature, will have serious adverse consequences, though lesser than fossil fuels. Thus, moderation in energy demand, saving and sharing energy will have to be the bedrock of these renewable energy policies.

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## India's INDC and the World's Largest Carbon Offset Project

India's recently released Intended Nationally Determined Contribution (INDC) submission to the United Nations Framework Convention on Climate Change (UNFCCC) carries a tagline: *working towards climate justice*. The Indian government, and its Ministry of Environment, Forests and Climate Change in particular, want us all to believe that the INDC outlines a policy framework and specific action points that lead us to *climate justice*. Because we use the same phrase while critiquing international climate negotiations in general and also, more specifically, domestic climate policies to offer concrete examples of what is not climate justice, this sudden assertion on the part of the government that its policies of extracting and burning more fossil fuels, and 'streamlining environment and forest approvals' connote climate justice presents us with a fine dilemma. Leading environmental groups in India (for instance, the Centre for Science and Environment) have hailed the INDC submission as 'fair and ambitious' — thus agreeing with the government's position — and left us in the lurch. Where is the *justice*, what is *fair* and *ambitious*, we ask ourselves? Is it all rhetoric sans action, an endless topsy-turvy world in which known things and words are made to stand on their head? Apparently, nothing makes sense any more, or worse, makes the wrong kind of sense. After going through the text of India's INDC submission, the latter proves true: by dint of poor verbosity co-mingled with unsubstantiated data, the INDC document reasserts India's usual position regarding emissions, which means that it must be allowed to burn coal, and destroy forests for coal and other 'non-coal' energy harvesting, in the interests of rural electrification, poverty alleviation and now, *climate justice*. This short note briefly explores the connotations of the phrase in the context of forests, as expressed in the INDC.

"India's environment policy is anchored in the Constitution of India, Article 48-A of the Constitution states that ***"The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country"***....The Indian development process is guided by the aspiration of making India prosperous and progress on the path of ***"Development without Destruction"***.

(INDC, Section II, Policy Framework).

Indeed? According to India's union minister for Environment, Forests and Climate Change Prakash Javadekar's statements made in the Parliament, development projects have been approved on more than 1.84 lakh hectares of forest land in the last six years.<sup>1</sup> This, however, does not matter: he has also said that forest diversion is in essence reforestation, because for each hectare of forest being diverted, at least another hectare is being planted.<sup>2</sup> Following this gem of impeccable logical reasoning, the INDC keeps on reiterating that India has registered an increase in forest cover, "from 23.4% in 2005 to 24% of the geographical area in 2013", and this has resulted in an overall increase in carbon stock in India's forests, "...about 5%, from 6,621.5 million tonnes in 2005 to 6,941 million tonnes in 2013". Both these sets of figures are unsubstantiated, and based on calculations which keep on being challenged.<sup>3</sup> Moreover, plantations by forest department in India more often than not do not exist on the ground, and compensatory afforestation hardly takes place.<sup>4</sup> The scam in this is so obvious that even internal audits by state forest

department have started to notice it.

Ground reality and hard empirical data, however, have little or no space in the inverted reality of India's carbon world. The INDC talks of raising ten million hectares (mha) of new plantations (5 mha in forest areas, and 5 mha in lands outside recorded forest area), capable of sequestering "100 million tonnes CO<sub>2</sub> equivalent annually". Thus, "an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub>-equivalent through additional forest and tree cover" will be created by 2030. The finance for creating this gigantic 'sink' will come from internal, domestic sources, says the INDC, which is in sync with what the Environment Minister had earlier said in his Independence Day message this year: "...\$ 9 billion by 14<sup>th</sup> Finance Commission and \$ 6 billion through *Compensatory Afforestation Fund Bill will soon be made available... will definitely increase... carbon sink we are creating (italics added).*"

Fifteen billion dollars for financing ten million hectares of plantations by 2030. A new sink of 3 billion tonnes. What lies behind these wonderful, mind-blowing figures? How can India hope to raise, let alone spend, \$ 9 billion (the amount mentioned by the Finance Commission) on new plantations, without involving the private sector, and a fast-growing global market in forest carbon? The INDC forgets to mention that the Ministry of Environment and Forests has prepared a blueprint for privatising India's forests, and already sent a guideline to various states and union territories to identify suitable 'degraded' forest land for leasing out to private companies for raising plantations.

It also ignores the fact that India's overall compensatory afforestation figures reach nowhere near the statutory target, one major reason for which is non-availability of land outside recorded forest areas.<sup>10</sup> The target of raising 5 million ha of *additional* (hitherto non-existing) 'tree cover' in non-forest land within the next fifteen years might be *ambitious*, but not physically achievable without another organized bout of land-grab.

Raising plantations on forests with the help of the private sector will badly compromise India's forest communities' access to their forest commons: the MoEFCC guidelines make it clear that only 10-15 per cent of a particular forest area leased out to a private company will remain open to local communities. Otherwise also, plantations-as-sinks do not promote increased community access to forests; in order to be successful as 'carbon sinks', they have to plug all *leakages*. In other words, routine community activities such as extraction of firewood, small timber, non-wood forest produce and grazing of livestock have to stop in such sinks. This, in turn, calls for prima facie violation of statutes like Forest Rights Act and PESA, both of which provide for not only a range of forest rights to communities, but also powers to regulate access over forests they customarily use.

At the end, we are left with two possible scenarios. One, there will not be new plantations on ten million hectares (or five million, or even one), hence no additional sinks. Either land will not be available, or the plantations will not materialize. Two, notwithstanding scenario 1, community access and control over forests will be under severe attack as private players enter in a big way in the forestry sector, and the climatically 'just' Indian state will oversee the process.

Finally, there is one inescapable reality. Forests will be mined (coal for thermal power generation and industrial use), dammed (large and medium hydro electricity projects, as renewables), built upon and enclosed (large wind power projects, renewable once again, wild life conservation areas for tourism). The net upshot is that India's emissions will reach probably somewhere around 5 billion tonnes of carbon dioxide equivalent by 2030, leading to planetary disaster.<sup>11</sup> Let us not worry, though: India's new forest sink will offset half of this. Add projected emission reduction from other mitigation measures like nuclear, large hydro, clean coal and so on. Thus, the INDC gives us a no net emission scenario and the biggest, grandest, greatest carbon offset project ever conceived. Hurrah.

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## END NOTES

- 1 "...initiatives like Make in India, Digital India, creating National Industrial Corridors, streamlining environment and forest approvals, labour reforms and undertaking other measures for the ease of doing business have also fuelled the spurt in their growth rates. Amidst all this, policies to enable industries reduce their energy consumption play a critical role as an instrument for sustainable environment", INDC, Section 1.2, Enhancing Energy Efficiency in Industries.
- 2 <http://economictimes.indiatimes.com/news/politics-and-nation/green-bodies-welcome-indias-indc-on-climate-action/articleshow/49196294.cms> . "India's INDC is fair and is quite ambitious, specifically on renewable energy and forestry. It reflects its development challenges, aspirations of large numbers of poor people and the realities of climate change," said Sunita Narain, director general, Center for Science and Environment.
- 3 Press Trust of India, New Delhi, August 13, 2015. See [http://www.business-standard.com/article/pti-stories/1-84-lakh-hectare-of-forest-land-diverted-for-non-forest-use-115081301268\\_1.html](http://www.business-standard.com/article/pti-stories/1-84-lakh-hectare-of-forest-land-diverted-for-non-forest-use-115081301268_1.html) , accessed on October 17, 2015.
- 4 See <http://indianexpress.com/article/india/india-others/dont-say-diversion-of-forest-land-say-reforestation-prakash-javadekar/#sthash.MyGASSx3.dpuf> ), accessed on 17 October, 2015.
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- 11 Nagraj Adve and Ashish Kothari, 'A Flawed Climate Road Map', *Economic and Political Weekly*, L (42), October 17, 2015.



## India's INDC: Drumming up Climate Finance

On a first reading of India's INDC, it seems that the Indian government has taken a bold step by trying to mobilize climate finance mostly from internal resources, including budgetary support. Its *Intended Nationally Determined Contribution* (INDC) says that "Maximum share of India's current climate finance comes from budgetary sources, as most of the resources for adaptation and mitigation are built into the ongoing sectoral programmes" (p. 26). But it goes on to reveal in the next paragraph that: "India is not relying solely on budgetary resources and is experimenting with a careful mix of market mechanisms together with fiscal instruments and regulatory interventions to mobilize finance for climate change." Only towards the end of the text does it reveal that India is well short of mobilizing climate finance if it has to implement its proposed climate change actions between 2015 and 2030. According to the INDC India requires up to USD 2.5 trillion between 2015 and 2030. The current financial mobilization and future estimates are actually nowhere near this whopping target!

While the INDC does indicate budgetary support, uses fiscal instruments with possible quantum of internal resource mobilization and a slew of highly ambitious regulatory interventions, it does not mention clearly the market mechanisms that it wants to experiment with and very strangely failed to record also external finance and credit facilities that it is currently accessing. This includes the Clean Investment Fund, World Bank, Asian Development Bank, bilateral funds, carbon market funds through CDM, private sector and Exim banks.

The submission, therefore, lacks clarity on resource mobilization with a clear distinction between adaptation and mitigation fund. It is a somewhat confused reading between National Action Plan on Climate Change (NAPCC), State Action Plans on Climate Change (SAPCCs), various national policies addressing climate concerns such as the National Policy on Environment, National Policy for Farmers, National Electricity Policy and Integrated Energy Policy, fiscal instruments like coal cess, cuts in subsidies, increase in taxes on petrol and diesel, a highly ambitious regulatory regime without a strict implementation plan and market mechanisms including Perform, Achieve and Trade (PAT) and Renewable Energy Certificates (REC).

India's reliance on coal cess at this juncture to mop up resources for its clean energy projects goes against the spirit of its much-touted low carbon economic growth and reaching even a paltry target of reducing its 2005 emissions intensity by 33%-35% by the year 2030. Destructive coal mining will continue, precious forests will be lost, livelihoods will be lost, rights of forest people will be violated, to justify mobilization for financing clean energy and renewable projects.

The INDC also, perhaps deliberately, fails to correlate a huge investment of USD 6 billion in its ambitious plantation and eco-restoration programme through GIM, REDD+ and increased carbon stock, forest and tree cover – an investment mobilized out of deforestation and forest diversion for non-forest activities – to a concrete climate change action plan other than saying that carbon sequestration will be enhanced by 100 million tonnes of CO<sub>2</sub>-equivalent annually and transform India's forests in to a net carbon sink.

### **Finance for adaptation**

The INDC has addressed the issue of adaptation through five missions in the sectors related to agriculture, water, Himalayan ecosystems, forestry, capacity building and knowledge management. A huge number of missions, schemes, policies and programmes have been lined up as strategies and actions. This makes it difficult to distinguish those which are particularly directed at combating climate change and those which are purely developmental interventions. The Indian government has also declared setting up of a National Adaptation Fund to the tune of USD 55.6 million, but a detailed break-up and institutional framework is missing.

The interventions range from National Food Security Mission, National Mission on Sustainable Agriculture (NMSA), Pradhan Mantri Krishi Sinchayee Yojana, National Initiative on Climate Resilient Agriculture (NICRA), National Agroforestry Policy (NAP), National Water Mission, National Mission for Clean Ganga to controversial Coastal Regulation and Management, increased protected area network and disaster management. While most of the missions and schemes are supported from the Union budget, the crucial operational part and targeted financial mobilization is missing in the text. Only in the case of National Disaster Relief Fund (NDRF), it is mentioned that it is financed through a levy of cess while the scaled down Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) with an annual budgetary allocation of USD 5.5 billion is included in the text.

Considering that the INDC text itself mentions that India will need USD 206 billion (at 2015-2016 prices) between 2015 and 2030 to fund its adaptation activities, there is nothing in the text to indicate India's financial strategy to mop up this huge deficit other than relying on its budgetary support, internal resources of the related ministries and intended international support.

### **Financing Mitigation**

India's mitigation strategy and interventions include:

Promotion of clean energy through wind energy, solar power, biomass energy, hydropower, nuclear power, and clean coal

National Smart Grid Mission and Green Energy Corridor

Enhancing Energy Efficiency

Developing Climate Resilient Urban Centres

Solid Waste Management

Swachh Bharat Mission

Green Transportation Network in terms of Dedicated Railway Freight Corridors, Mass Rapid Transit System (MRTS)

Green Highways

International road transport corridor covering Bangladesh, Bhutan, India and Nepal (BBIN)

Manufacturing of Hybrid and Electric vehicles

Fuel Efficiency Programme

Afforestation

Pollution control and monitoring

Private sector contribution to combating climate change – CSR, Carbon Disclosure Project, Green Co Rating etc.

Of all these, the INDC text indicates indigenous finance mobilization in the context of promoting clean energy, green energy corridor, solid waste management, green highways, and afforestation. Private sector contribution through CSR is also indicated. While the clean energy and renewables are financed through coal cess and infrastructure bonds, what is missing is the crucial contribution of external finance from

carbon markets, multilateral banks, bilateral funds and exim banks, especially for super-critical thermal power plants, wind and solar energy and renewable energy evacuation and what is the future of such external financial assistance.

The text does not indicate how the energy efficiency programme, development of smart cities, new urban renewal mission, dedicated railway freight corridor, international road transport projects, fuel efficiency and manufacture of hybrid and electric vehicles programmes will be financed.

According to the text, till 2014-15, the coal cess has resulted in a collection of USD 2.7 billion, infrastructure bonds are supposed to bring in another USD 794 million. The ADB estimates that for energy sector alone, India will need USD 7.7 billion. The text does not indicate the financial modalities of the USD 6 billion green energy corridor projects to extract renewable energy.

The expenditure of USD 397 million on solid waste management has come in as grant-in-aid to states over the last few years; the text is silent on the period starting 2015. The green highways policy to develop 140,000 km long tree line with plantations is formulated on the basis of setting aside of 1% of the civil cost of road projects.

The INDC is ambitious enough to eye the CSR fund generated through 2% of the annual corporate profit amounting to USD 3.5 billion annually to invest in climate actions.

The funding of the country's most ambitious afforestation and eco restoration programme to develop India's forests as a huge carbon sink (to justify increasing emissions) for future carbon trading is deeply problematic. Like the unholy correlation between coal cess and funding of clean energy, this afforestation programme and the current fund of USD 6 billion earmarked for this programme has been mobilized on the basis of collecting Net Present Value (NPV) out of deforestation and diversion of forests for non-forest activity. And this unholy nexus will continue, India will see more deforestation, more mega projects, industries and mining on forest land since the INDC text has projected a figure of USD 12 billion to be mopped up by 2019-20 for funding the development of India's carbon sink. What this really hides is the intent to turn the India's forests into carbon sink while continuing to deforest, earn and fund this programme to develop a carbon market within the country. The recent guidelines to hand over 40% of the degraded forests to the private sector is a sign of tying up Indian forests to carbon trading.

Among all these highly ambitious pronouncements, holy or unholy nexus, what is missing of course is how India intends to fulfill its own target of USD 834 billion (at 2011 prices) that it requires for its mitigation activities till 2030.

### **In conclusion**

The INDC has tried to juggle with various financial instruments, including putting down vague and notional figures of fund mobilisation and shown expectations for greater international support for its climate actions and tried to provide a semblance of a targeted action plan for 2030 with a 'means of implementation'. Yet, the text clearly lacks a more detailed plan of implementation including a clear institutional framework and financing strategy.

Without a detailed and credible implementation strategy supported by a suitable institutional framework, financial instruments and mechanisms, it will be difficult for the rest of the world and the global community to accept India's current INDC on its face value. Ambitious pronouncements and unachievable targets will simply not work.

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Supplement

## Key Operational Aspects of INDIA'S INDC (Extracts from the Text)

### IV INDIA'S INDC


Keeping in view its development agenda, particularly the eradication of poverty coupled with its commitment to following the low carbon path to progress and being sanguine about the unencumbered availability of clean technologies and financial resource from around the world,

*India hereby communicates its Intended Nationally Determined Contribution (INDC) in response to COP decisions 1/CP.19 and 1/CP.20 for the period 2021 to 2030:*

1. To put forward and further propagate a healthy and **sustainable way of living** based on traditions and **values of conservation and moderation**.
2. To adopt a **climate friendly and a cleaner path** than the one followed hitherto by others at corresponding level of economic development.
3. To **reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level**.
4. To achieve about **40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030** with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).
5. To **create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent** through additional forest and tree cover by **2030**.
6. To **better adapt** to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
7. To mobilize **domestic and new & additional funds** from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
8. To **build capacities**, create domestic framework and international architecture for quick diffusion of cutting edge climate technology in India and for joint collaborative R&D for such future technologies.

To achieve the above contributions, India is determined to continue with its on-going interventions, enhance the existing policies as detailed in previous sections and launch new initiatives in the following priority areas:

- 1) Introducing new, more efficient and cleaner technologies in thermal power generation.
- 2) Promoting renewable energy generation and increasing the share of alternative fuels in overall fuel mix.
- 3) Reducing emissions from transportation sector.
- 4) Promoting energy efficiency in the economy, notably in industry, transportation, buildings and appliances.



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- 5) Reducing emissions from waste.
- 6) Developing climate resilient infrastructure.
- 7) Full implementation of Green India Mission and other programmes of afforestation.
- 8) Planning and implementation of actions to enhance climate resilience and reduce vulnerability to climate change.

India has also revisited the National Missions under the NAPCC in the light of new scientific information and technological advances and identified new missions or programs on wind energy, health, waste to energy, and coastal areas. It is also redesigning the National Water Mission and National Mission on Sustainable Agriculture.

It is clarified that India's INDC do not bind it to any sector specific mitigation obligation or action, including in agriculture sector. India's goal is to reduce overall emission intensity and improve energy efficiency of its economy over time and at the same time protecting the vulnerable sectors of economy and segments of our society.

The successful implementation of INDC is contingent upon an ambitious global agreement including additional means of implementation to be provided by developed country parties, technology transfer and capacity building following Article 3.1 and 4.7 of the Convention.

## **1. MITIGATION STRATEGIES**

### ***1.1 CLEAN AND EFFICIENT ENERGY SYSTEM***

Energy is a vital input for production and growth. Considering universal energy access and energy security as one of the fundamental development goals for the country, Government of India (GoI) has undertaken a two pronged approach to cater to the energy demand of its citizens while ensuring minimum growth in carbon emissions. On the generation side, the Government is promoting greater use of renewables in the energy mix mainly through solar and wind power and shifting towards supercritical technologies for coal based power plants. On the demand side, efforts are being made to efficiently use energy through various innovative policy measures under the overall ambit of Energy Conservation Act.

The energy intensity of the economy has decreased from 18.16 goe (grams of oil equivalent) per Rupee of GDP in 2005 to 15.02 goe per Rupee GDP in 2012, a decline of over 2.5% per annum.

#### ***1.1.1 Promotion of Clean Energy***

**India is running one of the largest renewable capacity expansion programs in the world.** Between 2002 and 2015, the share of renewable grid capacity has increased over 6 times, from 2% (3.9 GW) to around 13% (36 GW). This momentum of a tenfold increase in the previous decade is to be significantly scaled up with the aim to achieve 175 GW renewable energy capacity in the next few years. India has also decided to anchor a global solar alliance, InSPA (International Agency for Solar Policy & Application), of all countries located between the Tropic of Cancer and the Tropic of Capricorn.

1) **Wind energy** has been the predominant contributor to the renewable energy growth in India accounting for 23.76 GW (65.2%) of the renewable installed capacity, making India the 5th largest wind power producer in the world. With a potential of more than 100 GW, the aim is to achieve a target of 60 GW of wind power installed capacity by 2022.

2) **Solar power** in India is poised to grow significantly with Solar Mission as a major initiative of the Government of India. Solar power installed capacity has increased from only 3.7 MW in 2005 to about 4060 MW in 2015, with a CAGR of more than 100% over the decade. The ambitious solar expansion programme seeks to enhance the capacity to 100 GW by 2022, which is expected to be scaled up further thereafter. A scheme for development of 25 *Solar Parks, Ultra Mega Solar Power Projects*, canal top

solar projects and one hundred thousand solar pumps for farmers is at different stages of implementation. Government of India is also promoting solarization of all the 55,000 petrol pumps across the country out of which about 3,135 petrol pumps have already been solarized.

3) **Biomass energy** constitutes about 18% of total primary energy use in the country and more than 70% of the country's population depends on it. However, it is currently used in an inefficient manner with high levels of indoor pollution. A number of programmes have been initiated for promotion of cleaner and more efficient use, including biomass based electricity generation. It is envisaged to increase biomass installed capacity to 10 GW by 2022 from current capacity of 4.4 GW.

4) **Hydropower** contributes about 46.1 GW to current portfolio of installed capacity, of which 4.1 GW is small hydro (upto 25 MW) and 41.99 GW is large hydro (more than 25 MW). Special programmes to promote small and mini hydel projects, new and efficient designs of water mills have been introduced for electrification of remote villages. With a vast potential of more than 100 GW, a number of policy initiatives and actions are being undertaken to aggressively pursue development of country's vast hydro potential.

5) India is promoting **Nuclear Power** as a safe, environmentally benign and economically viable source to meet the increasing electricity needs of the country. With a 2.2% share in current installed capacity, total installed capacity of nuclear power in operation is 5780 MW. Additionally six reactors with an installed capacity of 4300 MW are at different stages of commissioning and construction. Efforts are being made to achieve 63 GW installed capacity by the year 2032, if supply of fuel is ensured.

6) **Clean Coal policies:** Coal based power as of now accounts for about 60.8% (167.2 GW) of India's installed capacity. In order to secure reliable, adequate and affordable supply of electricity, coal will continue to dominate power generation in future. Government of India has already taken several initiatives to improve the efficiency of coal based power plants and to reduce its carbon footprint. All new, large coal-based generating stations have been mandated to use the highly efficient supercritical technology. Renovation and Modernisation (R&M) and Life Extension (LE) of existing old power stations is being undertaken in a phased manner. **About 144 old thermal stations have been assigned mandatory targets for improving energy efficiency.** Coal beneficiation has been made mandatory. Introduction of ultra-supercritical technology, as and when commercially available is part of future policy. **Besides, stringent emission standards being contemplated for thermal plants would significantly reduce emissions.**

7) **National Smart Grid Mission** has been launched to bring efficiency in power supply network and facilitate reduction in losses and outages. **Green Energy Corridor** projects worth INR (Indian National Rupee) 380 billion (USD 6 billion) are also being rolled out to ensure evacuation of renewable energy.

The Government's goal of *Electricity for All* is sought to be achieved by the above programs that would require huge investments, infusion of new technology, availability of nuclear fuel and international support.

### ***1.2 Enhancing Energy Efficiency***

With the goal of reducing energy intensity of the Indian economy, Ministry of Power through Bureau of Energy Efficiency (BEE) has initiated a number of energy efficiency initiatives. **The National Mission for Enhanced Energy Efficiency (NMEEE)** aims to strengthen the market for energy efficiency by creating a conducive regulatory and policy regime. It seeks to upscale the efforts to unlock the market for energy efficiency and help achieve total avoided capacity addition of 19,598 MW and fuel savings of around 23 million tonnes per year at its full implementation stage. The programmes under this mission have resulted in an avoided generation capacity addition of about 10,000 MW between 2005 and 2012 with government targeting to save 10% of current energy consumption by the year 2018-19. Demand Side Management programmes have been launched to replace existing low-efficiency appliances:

1) During the last decade, there has been rapid transformation of **efficient lighting in India**. The sales of Compact fluorescent lamps (CFLs) have risen to about 37% of the total lighting requirements in 2014 from 7.8% in 2005. India has also launched an ambitious plan to replace all incandescent lamps with Light-emitting diode (LED) bulbs in the next few years leading to energy savings of upto 100 billion kilowatt hours (kWh) annually.

2) **Standards and Labeling Programme** launched by the Government of India enables consumers to make informed decision by providing information about the energy consumption of an appliance. Currently, 21 equipment and appliances are labeled. The programme has contributed to an increase of 25% to 30% in the energy efficiency of an average refrigerator or air-conditioner in 2014 compared to those sold in 2007. **Super-Efficient Fan** (that uses half as much energy as the average fan) programme has been launched. Further, two sets of **Corporate Average Fuel Consumption standards** for cars have been notified, with one coming into force in 2017 and the second set in 2022.

3) **Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)**, a risk sharing mechanism to provide financial institutions with a partial coverage of risk involved in extending loans for energy efficiency projects, and **Venture Capital Fund for Energy Efficiency (VCFEE)**, a trust fund to provide “last mile” equity capital to energy efficiency companies, have been established.

4) The **Energy Conservation Building Code (ECBC)** sets minimum energy standards for new commercial buildings. Eight states have already adopted and notified the ECBC, and over 300 new commercial buildings have become compliant. The Code would be made more stringent to promote construction of even more (Near-Zero) energy-efficient buildings. “**Design Guidelines for Energy Efficient Multi-storey Residential buildings**” have also been launched.

5) In order to both recognize energy-efficient buildings, as well as to stimulate their large scale replication, India has developed its own building- energy rating system **GRIHA (Green Rating for Integrated Habitat Assessment)**, based on 34 criteria like site planning, conservation and efficient utilization of resources etc. A number of buildings including Commonwealth Games Village have been rated using GRIHA system. Indira Paryavaran Bhawan, the headquarters of Central Government’s Ministry of Environment, Forest & Climate Change is a model building of Government of India and has received LEED India Platinum and a 5 Star GRIHA rating. It is a ‘Net Zero Energy’ building with 100% onsite power generation.

## **1.2 ENHANCING ENERGY EFFICIENCY IN INDUSTRIES**

Infrastructure sectors, viz. electricity, coal and cement have seen a growth rate of 4.5% in the year 2013-14. The recent initiatives like **Make in India, Digital India**, creating **National Industrial Corridors**, streamlining environment and forest approvals, labour reforms and undertaking other measures for the ease of doing business have also fuelled the spurt in their growth rates. Amidst all this, policies to enable industries reduce their energy consumption play a critical role as an instrument for sustainable environment through various interventions like:

1) **Perform, Achieve and Trade (PAT)**, as a market based energy efficiency trading mechanism, at present covers 478 plants (designated consumers) in eight energy-intensive industrial sectors accounting for one-third of total energy consumption in the country. The mandated decrease in the specific energy consumption under PAT programme has led to a decline of 4 to 5% in their specific energy consumption in 2015 as compared to that in 2012. Energy Saving Certificates (ESCs) are issued to consumers who over-achieve the target. The scheme is to be widened and deepened to include additional sectors like railways, electricity distribution and refineries in the next cycle and would cover more than half the commercial energy consumed in India.

2) **Zero Effect, Zero Defect (ZED)**: The **Make in India campaign** with ZED is a policy initiative to rate

Medium & Small Industries on quality control and certification for energy efficiency, enhanced resources efficiency, pollution control, use of renewable energy, waste management etc. using ZED Maturity Assessment Model. **The scheme launched in 2015, envisages coverage of about 1 million medium and small enterprises.**

### ***1.3 DEVELOPING CLIMATE RESILIENT URBAN CENTERS***

Government of India in recent times has launched a number of schemes for transformation and rejuvenation of urban areas including **Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** and **National Heritage City Development and Augmentation Yojana (HRIDAY)**:

1) Under the **Smart Cities Mission**, 100 **smart cities** are planned with the objective to develop new generation cities, which will provide core infrastructure and a decent quality of life to its citizens by building a clean and sustainable environment. Smart solutions like recycling and reuse of waste, use of renewables, protection of sensitive natural environment will be incorporated to make these cities climate resilient.

2) **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**, a new urban renewal mission has been launched by Government of India for 500 cities with focus on ensuring basic infrastructure services such as water supply, sewerage, storm water drains, transport and development of green spaces and parks by adopting climate resilient and energy efficient policies and regulations.

### ***1.4 PROMOTING WASTE TO WEALTH CONVERSION***

India recognizes the dual benefits that can arise from efficient waste disposal leading to enhanced environmental benefits along with conversion to energy. Incentives are being granted to cities to take up waste to energy conversion projects.



## The Great INDCian rope trick

Our Intended Nationally Determined Contribution  
Is supposed to tackle the threat of climate change,  
But nowhere there is any mention or indication  
Of what our peak emissions will be, or even a range.

We do not even want to say when we will peak  
Though science says by 2020 peak we must,  
Our obsession China has played the game slick  
Said - theirs will peak by 2030, not really fast.

We in India will keep burning more and more coal  
And generate dirty power by the terawatt hour,  
For supposed uplifting of the poor, the stated goal  
Who cares if coal makes the poor lives even more dour.

It does not matter that forests cover most a new coal site  
For India's economic growth, some sacrifices are must,  
In today's macho world, you're right if you have might  
And what the powerful does, is always deemed just.

We will happily mine more coal, one billion ton and more  
We do not care if the whole world is moving from coal,  
Rivers and coasts we pollute, and foul the earth to its core  
The dirtiest fuel we love, that's our strange climate goal.

Yes, we will install hundred gigawatts of PV solar  
And happily dam the rivers – medium, big and small,  
That is likely to give us 40 per cent of renewable power  
Where will the displaced millions go? It's their call.

Of course we are good at more energy efficiency  
Super critical we will go, have ACs with many star point,  
But that cannot be enough for energy self sufficiency  
It's the poor who need energy, not the new Casino joint.

Nuclear power, 63,000 MW and more we must have  
Let dangerous nuclear waste pile up all around us,  
All these planners and designers are foolishly brave  
Fukushima-Chernobyl realities are overcome thus.

We will go on a big forest planting spree, like mad  
And three gigatonnes of carbon we sequester by that stunt,  
Will take away forest access, make forest people sad  
These are our climate actions, blind, regressive and blunt.

**Soumya Dutta**