

# CLIMATE AMBITION BEYOND EMISSION NUMBERS

**Taking stock of progress by looking inside  
countries and sectors**

INDIA

*Garg A., Sudharma Vishwanathan S.*

**SEPTEMBER 2021**

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# CLIMATE AMBITION BEYOND EMISSION NUMBERS

## Taking stock of progress by looking inside countries and sectors

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The results presented in this report are outputs of the academic research conducted under the DDP BIICS project as per the contractual agreement. The academic work does not in any way represent our considered opinion for climate negotiations and also does not reflect the official policy or position of the Government of India.

# How is this document relevant to the Global Stocktake?

This document is part of a collective report that assesses the evolution of climate ambition in 26 countries and 3 hard-to-abate sectors through a granular and context-specific analysis of trends and progress of national and sectoral transformations.<sup>1</sup> This approach allows identifying what hinders and spurs action in countries and sectors, and understanding the conditions that can support enhanced ambition, which could be political, social, economic, governance.

These insights are directly relevant to four overarching functions of the Global Stocktake in support of its desired outcome, i.e. "to inform Parties in updating and enhancing, in a nationally determined manner, their actions and support in accordance with the provisions of the Paris Agreement, as well as enhancing international cooperation for climate action" (Article 14.3 of the Paris Agreement):

- Create the conditions for an open and constructive conversation on global cooperation (on e.g., technology, trade, finance, etc.), based on an in-depth understanding of the international enablers of enhanced country ambition.
- Organize a process for knowledge sharing and collective learning, based on concrete examples of actions already in place or being discussed, including best practices.
- Create space for open dialogues across different stakeholders to support better coordination of actions, based on a detailed understanding of the levers to be activated to enhance ambition in national and sectoral transitions
- Facilitate ownership by decision-makers of the climate challenge and the risks and opportunities of the low-emission and resilient transition, based on context-specific and granular analysis of barriers and enablers.

More specifically, the collective report in general – and this document in particular – can contribute to address some of the key guiding questions for the Global Stocktake<sup>2</sup>, notably:

- What actions have been taken to increase the ability to adapt to the adverse impacts of climate change and foster the climate resilience of people, livelihoods, and ecosystem? To what extent have national adaptation plans and related efforts contributed to these actions (Decision 19/CMA.1, paragraph 36(c))?
- How adequate and effective are current adaptation efforts and support provided for adaptation (Article 7.14 (c) Paris Agreement)?

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<sup>1</sup> The full report « Climate ambition beyond emission numbers - Taking stock of progress by looking inside countries and sectors" can be found at: <https://www.iddri.org/en/publications-and-events/report/climate-ambition-beyond-emission-numbers-taking-stock-progress>

<sup>2</sup> Draft Guiding Questions for the Technical Assessment of GST1 (version 20th October 2021), available at: [https://unfccc.int/sites/default/files/resource/Draft%20GST1\\_TA%20Guiding%20Questions.pdf](https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf)

- What are the barriers and challenges, including finance, technology development and transfer and capacity-building gaps, faced by developing countries?
- What is the collective progress made towards achieving the long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions referred in Article 10.1 of the Paris Agreement? What is the state of cooperative action on technology development and transfer?
- What progress been made on enhancing the capacity of developing country Parties to implement the Paris Agreement (Article 11.3 Paris Agreement)?
- To achieve the purpose and long-term goals of the Paris Agreement (mitigation, adaptation, and finance flows and means of implementation, as well as loss and damage, response measures), in the light of equity and the best available science, taking into account the contextual matters in the preambular paragraphs of the Paris Agreement:
  - What are the good practices, barriers and challenges for enhanced action?
  - What is needed to make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development?
  - What are the needs of developing countries related to the ambitious implementation of the Paris Agreement?
  - What is needed to enhance national level action and support, as well as to enhance international cooperation for climate action, including in the short term?
  - What is the collective progress made by non-Party stakeholders, including indigenous peoples and local communities, to achieve the purpose and long-term goals of the Paris Agreement, and what are the impacts, good practices, potential opportunities, barriers and challenges (Decision 19/CMA.1, paras 36(g) and 37(i))?

# Foreword

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Henri Waisman, Marta Torres Gunfaus, Anna Perez Catala, IDDRI.

Country commitments as reflected in enhanced Nationally Determined Contributions submitted to the UNFCCC are insufficient to put the world on track to achieve the collective objective of the Paris Agreement to hold temperature increase below 2 °C or 1.5 °C above pre-industrial levels. Furthermore, concrete policies and actions adopted by countries on the ground are often not sufficient to achieve these NDC targets. These conclusions highlight the need to increase ambition and to provide convincing evidence to accelerate action in the immediate and short term to give effect to this ambition. Yet these assessments are not sufficient to effectively guide the progressive increase of ambition, as organized by the cyclical process of the Paris Agreement.

## APPROACH

With this imperative in mind, this report adopts a different, complementary, perspective on climate ambition. It seeks to open the box of emission pathways, by considering multiple dimensions of the conditions that will make these pathways possible. These are technical, economic, political, social and governance considerations in need of attention to enable the required far-reaching and systemic transformation towards the long-term goal. On the one hand, the revision of emission targets needs to be directed by an assessment of how drivers of emissions should change to trigger transformation. On the other hand, converting emissions' targets into pertinent concrete implementation requires well-designed policy packages and investment plans that are also informed by a clear and detailed understanding of the starting point, priorities and interplays between the available levers of transformation.

This bottom-up assessment aims at contributing to the process of collective learning in support of the progressive increase of collective ambition, as inserted at the core of the Paris Agreement paradigm. Approaching climate ambition through the lens of underlying transformations calls for reflecting the heterogeneous nature and the multi-faceted aspects

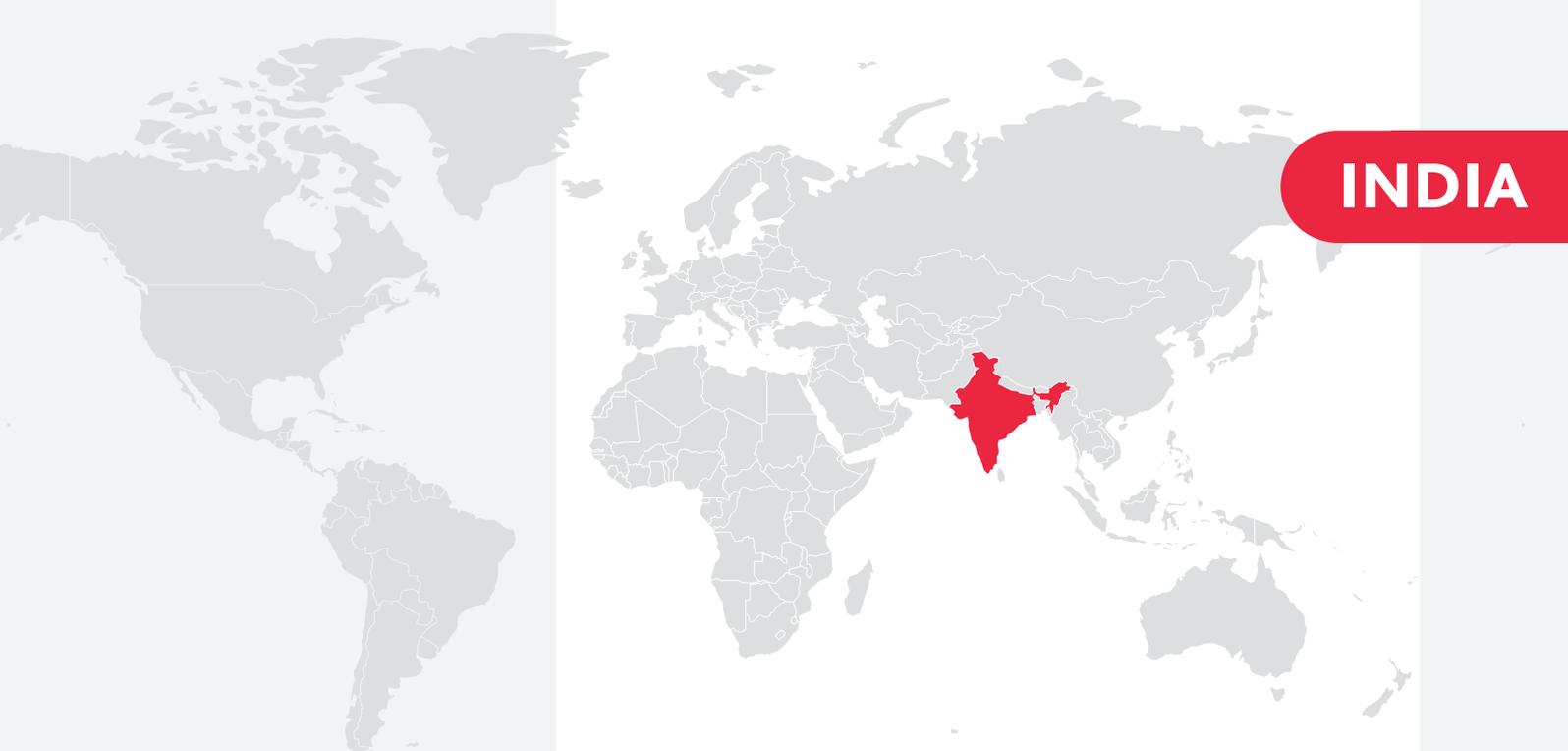
of transitions in different sectors and countries. This forces a move away from a purely global perspective and adopts a more granular approach based on country and individual sector perspectives. Thus, the report explores trends and progress on these transformations, as locally observed over the past years, notably since the Paris Agreement. This 'backwards looking' approach can help identify where developments are going in the right direction, where they should be accelerated and where major tensions remain that should be addressed as a priority to avoid undermining the transition. The picture of the state of the ambition discussion, firmly embedded in the country and sectoral realities, can provide means for reflection and action within the international climate community, particularly to inform focus areas for advancing the collective ambition agenda.

## STRUCTURE OF THE REPORT

This country report describes the recent evolutions of domestic discourses on climate ambition, national climate policy, national governance and concrete policies and actions with a significant effect on GHG emissions. The chapter highlights a selection of striking and structurally important elements to advance the transformation towards carbon neutrality from an in-country perspective.

This report is part of a full series of 26 country chapters and three sectoral chapters. The full report includes a "summary for decision-makers" to present 10 cross-cutting messages emerging from the country and sector analysis, as a guide to the selection of priorities for collective action in the post-COP26 period.

You will find the full report at: [https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/DDP\\_beyond%20emissions%20report.pdf](https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/DDP_beyond%20emissions%20report.pdf)



# CLIMATE POLICIES POST PARIS

## DOMESTIC DISCOURSE AND DEVELOPMENTS POST PARIS

*For a global net-zero by 2050, individual countries must achieve net-zero emissions sometime in future. Industrialized countries have to become net-zero around 2040. Countries like India can aspire for a net-zero status around the late 2070s or 2080s. At the same time, the industrialized countries have to leave some sufficient global carbon space to allow developing countries like India to meet their developmental aspirations under sustainable development goals (SDGs). Conceptually, no country should have any objection to peaking and net-zero, however timing will play an important role.*

The traditional argument made is that among the G20 countries, India has the lowest GDP per capita, low final energy consumption per capita, lowest power consumption per capita and lowest greenhouse gas (GHG) emissions per capita, and that it will meet and exceed its climate commitments. The merits of this position notwithstanding, the world must move to a positive discussion focusing on the solution space.

To put it in a global perspective, India would have no objection to net-zero target which must be preceded by peaking of emissions. The year and levels are not known though and no declarations have been made in this connection. Industrialized countries that have pledged to achieve net-zero by 2050

peaked their emissions in the 1990s-early 2000s, thus getting 40-60 years' time gap between their peaking and net-zero. India is likely to peak around during 2040s. India is likely to peak around 2040. The same time and equity-based logic would imply that India could be expected to become net-zero around 2075-80 and anything before that would be a bonus. The Indian policies and commitments to climate change capture the challenges and opportunities of balancing development with GHG emissions mitigation. These are synchronizing sustainable development and carbon neutrality in the long run. It would need a global carbon space to develop while simultaneously keeping an eye on decoupling growth with GHG emissions. It may be noted here that the developed countries have consumed around 75% of the global carbon budget since industrialization, and should they reach net-zero even by 2050 as perceived, the US would have consumed 22% of remaining global budget, the EU about 15%, and China another 70% making negative emissions a necessity for the world, without any current proven technologies at scale. The net-zero challenges would therefore only increase in future.

### ***Indian public as well as private enterprises pledging towards carbon-neutrality<sup>1</sup>.***

The world's biggest coal company, Coal India Limited, public sector undertaking (PSU) is committed to invest USD 763 million by March 2024 to build 14 solar projects to decarbonize its processes, help power its mining operations and cut costs<sup>2</sup>. Government-owned Indian Railways have also committed to achieving net-zero carbon emissions by 2030 by leveraging solar energy to meet its energy consumption needs.

Similarly, large Indian private firms such as Tatas – a USD 100 billion plus conglomerate (Tata Power, Tata Motors, Tata Chemicals, Tata Steel, Tata Consultancy Services), Reliance (over USD 200 billion), Mahindra Group, ITC, Infosys, Dalmia Cements, Ambuja Cements, Associated Cement Companies (ACC) Limited, Arcelor Mittal, Nippon Steel, Essar Oil &

Gas Exploration & Production, Jindal Steel Works Group, Sun Pharma, Vedanta Limited and Hyderabad-based Banka Biolo are committed to their own decarbonization strategies and some of which include net-zero targets by 2030. The strategies include stop future construction of coal-fired plants, shift to renewable energy, investment in energy efficiency projects, expand to include electric vehicles, and some isolated projects on carbon capture and storage technologies. Mahindra Group is the first Indian company to announce an internationally benchmarked carbon price (\$10/ton CO<sub>2</sub>) to fund green investments internally, while major cement companies (Ambuja and ACC for example) have announced internal carbon prices beyond USD 35 per ton. Reliance, Mahindra Group and Infosys are committed to net-zero carbon in 2035 and 2040 respectively, while Wipro is committed to net-zero GHG emissions by 2040. It is also interesting to note here that e-auction of coal mines for 16 mines had to be cancelled in 2020 due to no interest shown from industrial buyers in new coal mines. Therefore, it seems that Indian industries are gradually committing to low carbon futures individually.

## **NATIONAL GOVERNANCE ON CLIMATE CHANGE**

India follows federal structure, where the Constitution specifies the distribution of legislative, executive and judicial powers. The division of power for legislation are listed into Union List<sup>3</sup>, State List<sup>4</sup> and Concurrent List<sup>5</sup>. The Indian central government is working on revising its current NDC willing to increase its current pledges and considering long-term strategies to decarbonize the its current economy. The Indian central government is working on revising its first NDC willing to increase its current pledge and considering developing long-term strategies to decarbonize its current economy.

The National Action Plan on Climate Change (NAP-CC) in India was launched in 2008 and is the central piece of federal policy on climate change. The

<sup>1</sup> <https://changestarted.com/big-indian-companies-that-have-made-climate-commitments/>

<sup>2</sup> <https://www.reuters.com/article/coal-india-solar-idINKBN2830Z2>

<sup>3</sup> Central Government makes laws regarding 100 items

<sup>4</sup> States have exclusive powers to legislate with regards to items on the State List, however a few articles (249, 250, 252, and 253) can be legislated by the Union government (61 items)

<sup>5</sup> Both forms government can legislate a list of 52 items.

NAPCC is founded on the philosophy of balancing India's developmental priorities while simultaneously meeting objectives related to climate change mitigation and adaptation. The NAPCC has outlined actions and steps through eight national missions namely, solar mission, mission for enhanced energy efficiency, mission on sustainable habitat, water mission, mission for sustaining the Himalayan ecosystem, green India mission, mission for sustainable agriculture, mission on strategic knowledge for climate change. Currently the government is actively considering including three more missions – mission on health, coastal mission, and mission on transformative mobility and battery storage. Various other line ministries of federal government such as coal, road transport, railways, power, shipping, urban development, and rural development are mandated to support and provide policy guidelines to states for implementing elements of NAPCC.

Indian government has also been actively engaging with countries at bilateral and multilateral forums and expressing its standpoint on net-zero targets at international level. The central government and various ministries (Ministry of Coal, Ministry of New and Renewable Energy, Ministry of Petroleum and Natural Gas, Ministry of Railways and so on) in their individual capacities are committed to decarbonizing the Indian economy. Additionally, India has been a leading or member country of international alliances such as International Solar Alliance (ISA)<sup>6,7</sup>, Mission Innovation<sup>8,9</sup> and Coalition for Disaster Resilient Infrastructure (CDRI)<sup>10,11</sup>. In April 2021, U.S.-India launched a partnership to scale up

clean technologies<sup>12</sup> and strengthen climate action by mobilizing finance<sup>13</sup>. In May 2021, EU-India agreed on synergies to a safer, greener, cleaner, more digital, resilient and stable world, in line with the 2030 Agenda for Sustainable Development and the Paris Agreement<sup>14,15</sup>.

### ***Self-reliant India Mission (Atma Nirbhar Bharat) takes a hit due to successive waves of COVID19 pandemic.***

During COVID19, PM Modi launched the mission to focus on economy, infrastructure, system, demography and demand. The central government as measure to boost the slumped economy announced stimulus packages USD 420 billion (15% of GDP) in five phases (Unlock 1.0-April 2020, Unlock 2.0 – May 2020, Unlock 3.0 – July 2020, Unlock 4.0 - August 2020, Unlock 5.0 – September 2020). The first phase focused on medium and small businesses, followed by phase II, which supported the poor (including migrants and farmers). Phase III, IV and V focused on agriculture, encourage new growth (by privatizing commercial mining in coal and mineral sector, enhance self-reliance in defense production, and encourage private partnership in building airports, power distribution in Union Territories, building airports and space, and link robust start-up to nuclear sector) and government reforms (improve ease of doing business, increase allocation in MGNREGS to provide employment boost) respectively <sup>16,17</sup>.

### ***Subnational governments are pushing towards implementation of Climate Change Action Plans (State Actions on Climate Change Phase II).***

The Ministry of Environment, Forestry and Climate Change (MOEF&CC) motivated the State Governments to prepare their State Action Plans on Climate Change (SAPCC) in line with the strategies outlined

<sup>6</sup> <https://isolaralliance.org/about/background>

<sup>7</sup> Launched by India along with France at COP21 is a coalition of 86 member countries to establish networks and develop synergies to scale up solar energy applications and mobilize USD 1000 billion by 2030.

<sup>8</sup> <http://mission-innovation.net/our-members/>

<sup>9</sup> Global initiative of 24 countries and the European Commission (on behalf of the European Union). These 25 members have committed to seek to double public investment in clean energy RD&D and are engaging with the private sector, fostering international collaboration and celebrating innovators.

<sup>10</sup> <https://www.cdri.world/index.php/cdri-overview>

<sup>11</sup> Partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions that aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development. CDRI promotes rapid development of resilient infrastructure to respond to the Sustainable Development Goals' imperatives of expanding universal access to basic services, enabling prosperity and decent work.

<sup>12</sup> To decarbonize sectors including industry, transportation, power, and buildings; and build capacity to measure, manage, and adapt to the risks of climate-related impacts

<sup>13</sup> <https://www.state.gov/u-s-india-joint-statement-on-launching-the-u-s-india-climate-and-clean-energy-agenda-2030-partnership/>

<sup>14</sup> [https://ec.europa.eu/clima/news/eu-and-india-pledge-collaborate-more-closely-climate-action\\_en](https://ec.europa.eu/clima/news/eu-and-india-pledge-collaborate-more-closely-climate-action_en)

<sup>15</sup> <https://www.consilium.europa.eu/media/49516/eu-india-connectivity-partnership-8-may-2.pdf>

<sup>16</sup> <https://www.india.gov.in/spotlight/building-atmanirbhar-bharat-overcoming-covid-19>

<sup>17</sup> [https://www.indiabudget.gov.in/economicsurvey/doc/vol2chapter/echap01\\_vol2.pdf](https://www.indiabudget.gov.in/economicsurvey/doc/vol2chapter/echap01_vol2.pdf)

in NAPCC 2008. Till date, 33 States/UTs have prepared their SAPCCs and work is ongoing in various states to submit their second SAPCC. These are now closely linked with NDCs. Although SDGs and NDCs have a high degree of political backing from the Central government, the onus of implementation largely lies with the states. The state governments are currently revising their individual SAPCC in reference to India's NDCs. MoEF&CC also provided financial support to states for enhancing their capacities to undertake climate change activities. Projects on adaptation and mitigation measures are also funded as demonstration projects under Climate Change Action Programme (CCAP). In January 2018, MOEF&CC urged the States to revise their SAPCC by undertaking ambitious mitigation as well as adaptation action by considering the evolving context of climate science, policy and actions.

## **ACTION AND POLICIES**

India has revised and committed more ambitious climate targets post Paris Agreement. Incidentally the present federal government came into power in May 2014 and has been taking climate proactive measures since then. Paris happened in 2015 and in a way the Indian government aligned well with it, with co-initiating International Solar Alliance with France at COP, and gradually retching up its own renewable targets. National Solar Mission (NSM) targets were increased from 20GW to 100 GW by 2022. The total renewable energy target was been fixed at 175 GW by 2030 and has been further enhanced in 2020 to 450 GW by 2030. This is a huge jump considering that the highest single day load in India has hovered around 200 GW.

Steep targets have been given to about 480 industrial units for reducing their specific energy consumption under the Perform Achieve and Trade (PAT) scheme pre-Paris (2013-2016). It (National Mission of Enhanced Energy Efficiency) resulted in a total savings of approximately 13.28 Mtoe and avoided emissions of 31 Mt-CO<sub>2</sub>. Post Paris, the coverage of plants and sectors has been enhanced considerably rolling out six PAT cycles until 2025 with a total of 1073 DCs covering 13 sectors. It is projected that total energy savings of about 26 Mtoe translating

into avoiding of about 70 million tonnes of CO<sub>2</sub> will be achieved by March 2023.

In power sector, about 144 old thermal stations have been assigned mandatory targets for improving energy efficiency and at the same time a retirement of a total of 170 old thermal generation units having a cumulative capacity of 10.64 GW has happened post Paris. Additionally, under Ujjwal Discom Assurance Yojana (UDAY) scheme, it is targeted to reduce Aggregate Technical & Commercial (AT&C) losses leading to emission reductions of 7.99 MtCO<sub>2</sub> for 2015 and 6.07 MtCO<sub>2</sub> for 2016.

In transport sector, government has provided incentives for adopting and manufacturing electric vehicles leading to 1.8 million of electrified two-and three-wheelers in 2019. It may be noted here that about 62% of total annual gasoline consumption in India is by two-wheelers and converting them to EV first has been the government policy. Moreover, 30% of all new cars coming to the market have to be electric by 2030. Metro rail which had a coverage in 4 to 5 major cities before Paris Agreement, expanded over 650 km of metro rail operational in 18 cities of India by 2020.

In building sector, about 26 electric appliances are covered under mandatory and voluntary regime to reduce energy demand (55.7 BU), thereby reducing emissions (45.67 MtCO<sub>2</sub>e). There has been increase in energy efficient buildings leading to 0.36 MTCO<sub>2</sub>e savings per year from about 6000 green buildings. As on December 2020, a total of 287.4 million households have LPG connections for cooking (including PMUY beneficiaries) – over 3/4<sup>ths</sup> coming post Paris. LPG is replacing biomass and kerosene, thus increasing GHG emissions but making cooking much cleaner and contributing to reduced mortality and morbidity due to indoor air pollution in India.

In agriculture sector, under Energy Efficient Pump Programme, 74136 energy efficient pumps have been installed post Paris, resulting in estimated energy savings of 191 million kWh per year with avoided peak demand of 35 MW, and GHG emission reduction of 0.14 MtCO<sub>2</sub> per year.

Forestry sector will play an essential role in India's mitigation efforts by increasing the carbon sink through expansion of forests (afforestation, reforestation), densification of forests and agro-forestry (trees outside forests). Forest area comprises little more than 20% of India's geographic area and more than 50% of its population depend on agriculture. Hence, agro-forestry is not only consistent with climate mitigation targets but also consistent with Atma Nirbhar initiatives. Additionally, these efforts have strong synergies with forest conservation and SDG goals.

From adaptation perspective, micro-irrigation area covered 8.7 million hectares till November 2019. Under Swachh Bharat Abhiyan (Clean India Mission), more than 6.2 million individual toilets and 0.59 million community and public toilets have been constructed. As on December 2020, under the mission, 4340 cities have been declared ODF, while 100 per cent door-to-door waste collection has been achieved in over 83,434 wards. Cities will be one the main sites of low-carbon development under Smart Cities Mission (100 cities) and AMRUT scheme (500 cities – ensure basic infrastructure) (BUR1, BUR3).

### **Key international enablers<sup>18</sup>**

Five aspects of the solution space must be considered.

**First, acknowledging that climate action needs financing.** India puts in about \$100 billion each year for climate adaptation and ring-fencing its population and systems. This is likely to touch \$300 billion by 2050. It is high time that the industrialized countries make good on their promise of providing \$100 billion each year by 2020 and till 2025. Not even 10% of this amount has been provided so far.

One way for these transfers could be linking 'excess' per capita emissions of each country over the global average per capita GHG emissions. Each country will contribute funds equal to their excess emissions, multiplied by some agreed value per ton. If the total collection has to equal \$100 billion a year, this will be

around \$10 per ton of GHG emissions. This should be applicable to all countries, including India.

Additionally, there is need to facilitate the provision of cheaper finance through global financial institutions for climate change actions especially for MSMEs that employ over 110 million people in India.

### **Second, creating a common technology development pool in which industrialized and developing countries are equal partners.**

These technologies should include battery storage for the power sector and for electric vehicles (EVs), CO<sub>2</sub> capture utilization and storage (CCUS), hydrogen, advanced bioenergy and nuclear power. An important aspect for India is the question of energy security and making it clean. Coal is the mainstay of the Indian energy system.

India has retired 16,400 MW of old and inefficient coal-based plants recently, and plans to retire another 6,000 MW in the next 3-4 years. The plant load factor of existing coal plants is around 50% — almost half the time they are not producing power. Alongside is the very ambitious renewable energy plan of 450,000 MW solar capacity by 2030. To take in so much renewable power in the national power grid, India needs to create flexibility in the system. Storage and green hydrogen production could be the main methods for this.

Global battery storage technologies are not ready at scale, and may take a few years. The price of power has to remain affordable for masses, but wide spread storage deployment could double the price of power. This does not mean that India does not enhance efficiency of its power generation, transmission, distribution and usage. India should also bring climate change-supportive technologies into the 'Make in India' basket.

### **Third, involving business and industry in climate change discussions and action.**

As already mentioned, many Indian industrial and business houses have already committed to GHG mitigation targets. Cheaper financing could make implementing their pledges and attracting more players easier. Finance could be made available to businesses at the same terms as those in the industrialized countries — at a cheaper cost of capital. These are now not

<sup>18</sup> <https://economictimes.indiatimes.com/industry/renewables/view-how-india-can-achieve-its-net-zero-emissions-goal/article-show/81901910.cms?from=mdr>  
<https://economictimes.indiatimes.com/news/india/view-in-the-net-zero-war-gle-its-india-that-has-ma/articleshow/82174780.cms?from=mdr>

available. However, the \$100 billion a year funding could be used for 'interest rate subsidy', reducing the cost of finance by about 10 percentage points. This way the \$100 billion could finance \$1 trillion worth of climate actions every year. Furthermore, climate change-dependent risk disclosures should be made compulsory for businesses along with their energy and GHG emissions (SEBI guidelines reported earlier), especially for those with high exposure to climate change. Risk awareness and management should be promoted to curb the risks on general public.

**Fourth, net-zero is for the basket of all six GHGs and not CO<sub>2</sub> alone.** Around 15% of India's total GHG emissions are in the form of methane and NO<sub>2</sub> from the agriculture sector. These are very hard to mitigate due to the micro and dispersed nature of livestock and crop production. Agriculture would require special solutions and international institutional inputs on the lines of the Green Revolution.

**Fifth, bringing back the adaptation discussion to the table along with net-zero.** We cannot forget climate change impacts on the vast poor population in India, adaptation needs for them, and the concepts of climate equity and justice.



## DDP

The DDP is an initiative of the Institute for Sustainable Development and International Relations (IDDRI). It aims to demonstrate how countries can transform their economies by 2050 to achieve global net zero emissions and national development priorities, consistently with the Paris Agreement.. The DDP initiative is a collaboration of leading research teams currently covering 36 countries. It originated as the Deep Decarbonization Pathways Project (DDPP), which analysed the deep decarbonization of energy systems in 16 countries prior to COP21 ([deepdecarbonization.org](http://deepdecarbonization.org)). Analyses are carried out at the national scale, by national research teams. These analyses adopt a long-term time horizon to 2050 to reveal the necessary short-term conditions and actions to reach carbon neutrality in national contexts. They help governments and non-state actors make choices and contribute to in-country expertise and international scientific knowledge. The aim is to help governments and non-state actors make choices that put economies and societies on track to reach a carbon neutral world by the second half of the century. Finally, national research teams openly share their methods, modelling tools, data and the results of their analyses to share knowledge between partners in a very collaborative manner and to facilitate engagement with sectoral experts and decision-makers.

[www.ddpinitiative.org](http://www.ddpinitiative.org)



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The Institute for Sustainable Development and International Relations (IDDRI) is an independent, not-for-profit policy research institute based in Paris. Its objective is to identify the conditions and propose tools to put sustainable development at the heart of international relations and public and private policies. IDDRI is also a multi-stakeholder dialogue platform and supports stakeholders in global governance debates on the major issues of common interest, such as actions to mitigate climate change, protect biodiversity, strengthen food security, and to manage urbanisation. The institute also participates in work to build development trajectories that are compatible with national priorities and the sustainable development goals.

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