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PATHWAYS FOR DEEP DECARBONIZATION: ALIGNING INDIA'S NDC SUBMISSION WITH ITS NET-ZERO AMBITION

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SUMMARY

Achieving the Paris Agreement goals requires sustained, immediate emissions reductions combined with a zeroing-out of global GHG emissions by mid-century.[1] For developing countries like India, the challenge is to set an emissions trajectory that balances global commitments with national priorities and circumstances. In this policy brief, we suggest policy options to align India's new Nationally Determined Contribution (NDC) commitments with its long-term ambition to achieve net-zero emissions by 2070 utilizing policies that also address the country's socio-economic objectives.

In a recent policy-emissions-economy modeling exercise, we find that India can achieve deep decarbonization, i.e., reduce its expected emissions in 2050 from over 7.2 gigatons to around 2.2 gigatons (70 percent from business-as-usual) (Figure 1), while simultaneously accelerating jobs and GDP growth. We then compare this emissions trajectory to India's current policy mix, including the topline targets from its new NDC announced in August 2022.[2] We find that deep decarbonization presents significant economic opportunities for India. To unlock these opportunities, India could consider the following actions:

- Improve the sector-specificity of its conditional NDC commitments.
- Develop a strategic plan for the retirement of fossil-fuel assets and the associated international climate finance required.
- Publish a carbon pricing policy framework to mobilize domestic climate finance.
- Indicate either a peaking year or a peaking level based on best-available modeling to send a predictable signal to the marketplace.

Current Conditions

In India, the costs of climate change are already occurring and are expected to escalate. More than 75 percent of Indian districts are exposed to extreme climate events, and estimated losses from climate-induced disasters in the past two decades near $200 billion.[3] Unmitigated climate change could cause $6 trillion in monetary losses by 2050 to the Indian economy.[4] Labor productivity losses could rise to the equivalent of 34 million jobs by 2030.[5] Each additional degree of temperature rise is estimated to reduce Indian maize yields by 5 percent, wheat yields by 9 percent, and rice yields by 7 percent.[6]

This policy brief discusses how India can align its new Nationally Determined Contribution with its long-term ambition to achieve net-zero emissions by 2070.

FLETCHER *The graduate school of global affairs at Tufts University*

While the cost of inaction is real, acting to reduce emissions is not cost free. India's challenge is to decarbonize and adapt while at the same time creating millions of new jobs, increasing incomes, and improving public health over the next few decades. The task is a monumental one. India's youth constitute about one-third of its 1.38 billion population. The prevailing youth unemployment rate is 32 percent and 80 percent of its 50 million workforce is employed in the informal sector.[7] This includes 70 percent of the 2.6 million workers engaged in coal mining.[8] India's per-capita GDP ($2500) continues to lag major economies and several emerging economies.[9]

India has set ambitious national economic and climate-relevant targets. In this decade, India's Prime Minister Narendra Modi has targeted a $5 trillion-dollar economy[10] and has announced ambitious economic development plans that would double farmers' incomes,[11] extend last-mile energy connectivity to households, and generate 100 million additional manufacturing jobs.[12] India would like to achieve energy independence (ending coal and oil imports) by 2047.[13] That will mean the country must expand domestic electricity generation, electrify the economy, and create a stable energy market to achieve these goals.

Government targets include reaching 500 gigawatt of renewable electricity capacity and achieving 65 percent of all new vehicle sales to be electric by 2030.[14] As part of this process, India has created national missions on electricity storage, batteries, and hydrogen.[15] Moreover, Indian cement and steel companies are founding members of the Science-Based Targets Initiative to create zero-carbon alternatives in those sectors by 2050.[16] In 2017, India added more renewables than coal for the first time in history; in 2021-22, it ranked third globally for renewable capacity additions (13.5 GW).[17] The proportion of thermal power capacity decreased from 64.8 percent in 1990 to 57.3 percent in 2018, while renewables increased to 21 percent in the same period.[18]

In 2017, India added more renewables than coal for the first time in history; in 2021-22, it ranked third globally for renewable capacity additions.

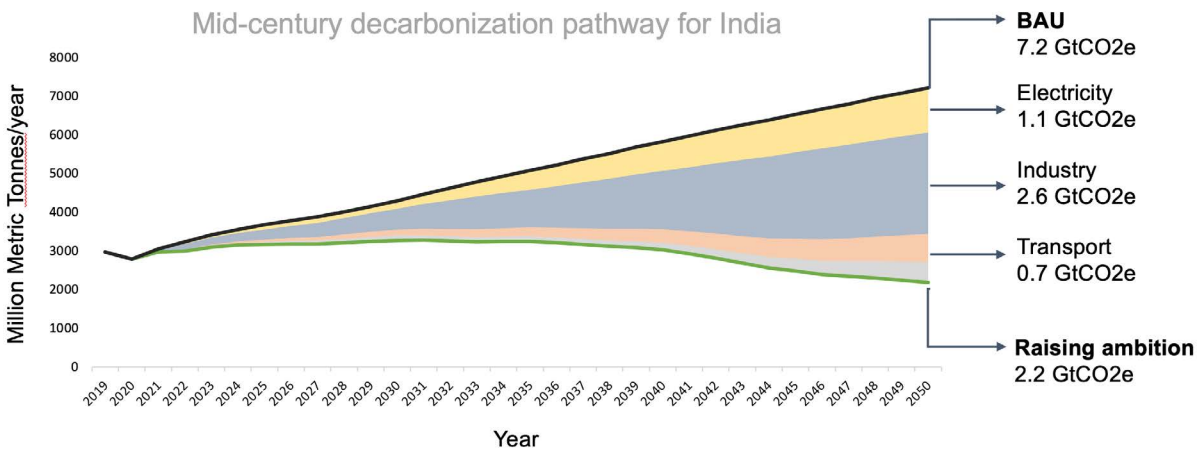
At COP26 in Glasgow, the Prime Minister announced a long-term ambition to achieve net-zero greenhouse gas emissions by 2070.[19] He also made clear that India expects to raise trillions in climate finance — including private sector and international finance — to meet its ambitious climate goals. Therefore, it is striking that India's NDC looks likely to be more conservative than its political announcements and existing national policies.

The top-line commitments in the new NDC include limited ambition to reduce the energy intensity of its GDP by 45 percent by 2030 from 2005 levels and to increase non-fossil power generation capacity to half of total capacity by 2030.[20] These targets represent an enhancement over India's previous NDC and are broadly in-line with its common-but-differentiated responsibility for climate change. India misses an opportunity, however, to reap the economic benefits of a more decisive approach to decarbonization. In the next section, we elaborate on India's potential to concurrently realize both climate and economic aspirations.

Policy Implications

In modeling deep decarbonization pathways for India, we find that deep decarbonization presents significant economic opportunities for the country. To unlock these opportunities, India needs to enhance the specificity of its NDC and define more categorically its plans for improving implementation of existing national NDC-relevant policies. Our modeling results show that, conditional on receiving international climate finance, India can commit to and achieve additional sectoral targets that will peak or plateau its emissions curve, put the economy on a net-zero pathway, create gainful employment and grow GDP beyond business-as-usual. In the 'raising ambition' scenario we modeled, India achieves an emissions wedge 30 percent below BAU emission levels by 2030 and 70 percent below BAU by 2050 (See Figure 1). Emissions intensity of GDP would fall 62 percent by 2030 (relative to 2005), significantly better than the 50 percent committed in the NDC and observed in a business-as-usual scenario. This trajectory is also more compatible with India's 2070 net-zero goal. However, the emissions left to mitigate beyond 2050 are in 'hard-to-abate'

Figure 1: Emission pathway under BAU and 'raising ambition' scenarios



Source: India EPS

sectors (industry and agriculture), for which cost-effective technological solutions are still emerging.

The 'raising ambition' deep decarbonization scenario generates an average 3 percent higher GDP than the BAU and cumulatively adds nearly 8 million new jobs by 2030, rising to a cumulative 43 million jobs over BAU by 2050. All of these results come with a significant financial cost, however. The transition under the 'raising ambition' scenario will reduce government cash flow up to $68 billion per year by 2030 and $420 billion per year by 2050. This estimate is a starting point to negotiate a combination of international climate finance to kick-start India's net-zero transition and followed with domestic climate finance mobilized through the implementation of carbon pricing policies.

Based on the possibilities seen in our modeling analysis, we recommend the following updates to the conditional commitments of the NDC so that it is in alignment with India's 2070 net-zero trajectory:

- Improving sector-specificity of the conditional NDC, particularly by including time-bound technology penetration targets for the transportation and industry sectors in the NDC and clarifying the additional international finance required in all sectors (beyond policies already being implemented or financed domestically).
- Stating time-bound targets and additional finance required for the retirement of fossil-fuel assets, particularly in the electricity sector.
- Publishing a carbon pricing policy framework — to cover for the losses in fuel tax revenues under a decarbonization pathway and mobilize domestic climate finance for the transition beyond 2030.
- Devising a phased-in program to use carbon revenues to address 1) distributional equity in the transition, 2) short- and long-term effects on industrial competitiveness, 3) reduction of the tax burden arising from carbon prices, and 4) reinvestment in additional emissions reduction activities.
- Indicating either a peaking year or a peaking level based on best available modeling. Our modeling indicates that a peaking level under 4 gigatons of annual carbon dioxide equivalent and a peaking year between 2030 and 2035 is feasible.

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Endnotes

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