A PHASED POLICY MIX TO ACHIEVE INDIA'S ECONOMIC AND CLIMATE GOALS

Authors: Tarun Gopalakrishnan, Easwaran Narassimhan, and Kelly Sims Gallagher

CLIMATE POLICY LAB

With an appropriately diversified and strategically phased policy mix, India has a pathway to achieve its socio-economic ambitions as well as its 2070 net zero commitment. This policy brief reviews the current trajectory of the Indian economy and climate action and presents conclusions from a system dynamics emissions-economy modelling study. Better implementing its existing climate policies and phasing-in key additional climate policies can zero out India's carbon emissions by 2050 and contribute to economic growth and job creation while preserving long-term fiscal stability.

Current Trends

India's economic growth rate has recovered to pre-pandemic levels. It continues to progress on zeroing out extreme poverty and building an infrastructure foundation while maintaining fiscal restraint. Emissions intensity of GDP has reduced by over 33 percent since 2005, despite a post-pandemic uptick in the energy intensity of the economy. This is partly driven by record additions of solar power capacity, resulting in a steadily increasing share of non-fossil sources in the energy mix. India is hence well on track to achieve its updated Nationally Determined Contribution targets submitted under the Paris Agreement.

However, India is not on track to achieve its more ambitious (non-NDC) target of 450 gigawatt of renewable power capacity by 2030. Total annual greenhouse emissions continue to rise, which makes achieving the Prime Minister's commitment to net zero by 2070 increasingly challenging. Furthermore, there are increasingly apparent limitations in its current development pathway, particularly when set against the ambition to be a middle-income economy by mid-century. Formal job creation is not robust, investment in innovation is conservative, foreign investment growth is plateauing, and chronic environmental crises — epitomized by air quality in New Delhi — are compounding. The cost to national health from air pollution currently exceeds $100 billion each year. The annual cost of adapting to climate change is projected at around $1 trillion in 2030 and will continue to rise.

Tufts UNIVERSITY

FLETCHER The graduate school of global affairs at Tufts University

Current climate commitments and action

In this context, the increasing need for global climate ambition is an opportunity to progressively reorient India's development trajectory. It is starting from a strong base – more than 160 climate policies are currently in place nationally, including economy-wide policies as well as sectoral policies for electricity, transportation, buildings and residences, industrial emissions and agriculture, forests and land use (AFOLU).

Long-standing policies such as subsidies and mandates for solar power, industrial energy efficiency and vehicle fuel efficiency have been partially effective despite inconsistencies in implementation. While their emissions impact is limited, they have resulted in growing private investment – including foreign investment – in clean power and transportation, and some improvements in industrial energy efficiency. However, even if scaled up, they cannot by themselves create the investment environment needed to displace fossil fuels.

Significant recent additions to India's policy inventory recognize this need. These include national missions on energy storage and green hydrogen, production-linked incentives for clean energy, and market frameworks for carbon and sustainability credits. This expanding policy support to emerging sectors is a forward-looking strategy that can stimulate valuable innovation.

Near-term policy and implementation gaps

Competitive innovation is driven by a combination of supply-push and demand-pull factors. The above supply-push policies aimed at producers will not have the full desired effect until they are combined with ambitious demand-pull policies such as technology standards, subsidies for buyers and/or public procurement.

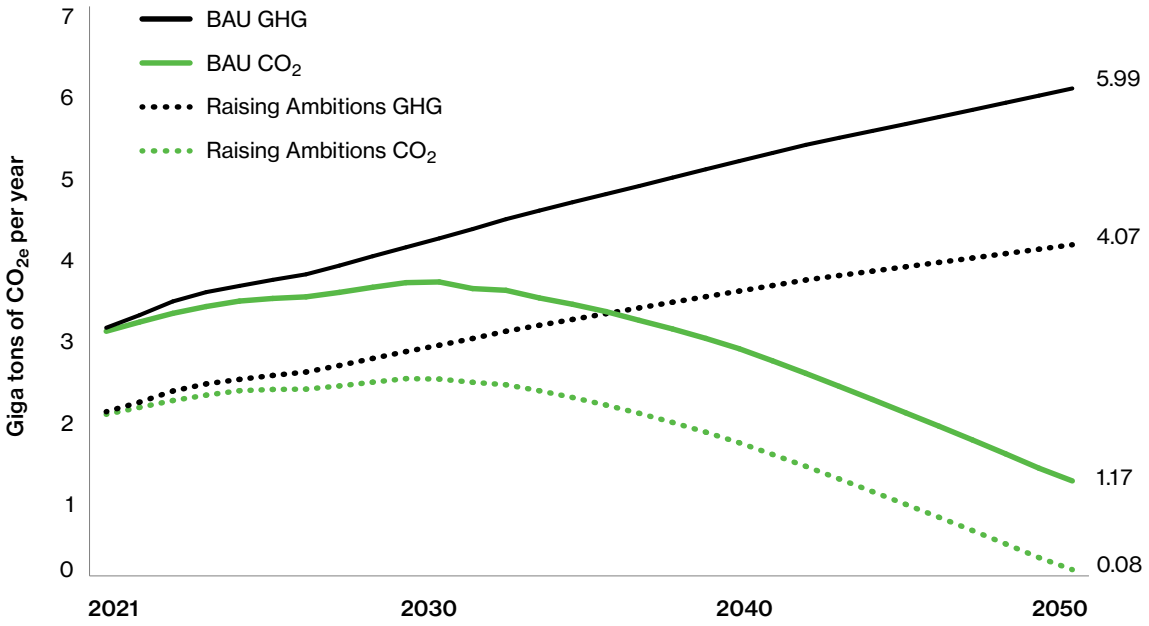
Existing policies such as renewable purchase obligations and industrial energy efficiency standards need to be periodically revised to continue to stimulate demand. Sales of electric vehicles are growing but fuel efficiency standards are no longer sufficient to drive their uptake at the scale and speed needed. More stringent enforcement of existing vehicular pollution rules, carbon pollution regulation, public procurement, and/or mandates for electric vehicles are needed.

Figure 1: Phasing in climate policies can put India on a socio-economically beneficial decarbonization pathway

According to our analysis, implementing this policy mix can bend India's emissions curve, peaking carbon dioxide emissions around 2030 at 2.4 gigatons (and total greenhouse emissions at 3.6 gigatons), with no negative impact on GDP growth and 5 million additional jobs created over business as usual. Government revenue from petrol and diesel taxation is negatively impacted but limiting fuel imports generates a greater measure of near-term economy-wide savings (INR 10 trillion in 2030).

Because of how power tariffs are set as well as under-enforcement of pollution norms, a coal plant that has paid off its initial capital costs is financially capable of running well beyond its nominal operating life. Older coal plants will hence continue to limit the share of non-fossil power, unless progressively phased out. While potentially beneficial at the national level, retiring coal plants impacts regional economies, particularly in India's heartland. To effectively retire plants starting in 2030, a pre-determined phaseout framework balancing financial, technical, environmental and equitable considerations is necessary.

Figure 2: Emission trajectory under the Raising Ambitions scenario



Frameworks for long-term decarbonization

Pushing toward mid-century, zeroing out carbon will require continued implementation of the above policies, as well as the addition of two key policy types – progressive retirement of coal power plants and a carbon tax. These are politically challenging policies. In our modelling, we initiate these in the year 2030 and slowly ramp up their level of ambition toward 2050. If implemented, this policy mix has the potential to add 2 percent to GDP and 30 million jobs over business-as-usual by 2050.

If existing decarbonization policies are fully implemented and effective, the government's revenue from petrol and diesel taxation is likely to decline beyond 2030. A progressively scaled up carbon tax starting in 2030 can offset this loss. The recent introduction of a carbon market framework is a possible first step towards such revenue stabilization. However, to generate the revenue needed, the framework needs to include a basis for introducing sector-specific emissions caps or comparably strong price signals. To

FOR ACADEMIC CITATION:

Gopalakrishnan, T., Narassimhan, E. & Gallagher, K. S. "A phased policy mix to achieve India's economic and climate goals." Policy Brief, Climate Policy Lab, The Fletcher School at Tufts University, November 2024.

ABOUT THE AUTHORS:

Tarun Gopalakrishnan is a Pre-doctoral Fellow at the Climate Policy Lab at The Fletcher School, Tufts University.

Easwaran J. Narassimhan is a Fellow and Coordinator at the Sustainable Futures Collaborative.

Kelly Sims Gallagher is Dean and Professor of Energy and Environmental Policy at The Fletcher School, Tufts University. She is also the Director of the Climate Policy Lab.

Photo: Sebastian Castelier/ Shutterstock.com

FUNDING FOR THIS RESEARCH:

This policy brief was supported by Sequoia Climate Foundation, William and Flora Hewlett Foundation, SED Fund, and Rockefeller Brothers Fund. Any errors or misrepresentations are the sole responsibility of the authors.

the extent that this is politically challenging, international climate finance will have to bridge the shortfall.

Conclusion

To combine climate and economic ambition, India can strengthen the stringency and implementation of current policies and phase-in selected new policies. Coupling supply-push (production subsidies, R&D support, pilots) with stronger demand-pull policies (procurement, regulations, mandates) can plateau its emissions curve by 2030 while creating millions of additional jobs and preserving GDP growth. Post-2030, a gradual phase out of coal power and implementation of a progressive carbon tax can accelerate decarbonization toward its 2070 net zero commitment and accelerate GDP growth and job creation, while maintaining fiscal stability. Domestic revenue mobilization could be politically challenging and will need to be augmented with international climate finance.

References

Climate Policy Lab. National Climate Policy Inventories: India.

Economic Times (2024). More than 30% of Delhi city vehicles lack pollution under control certificates (PUCC).

Gallagher, K. S., Grübler, A., Kuhl, L., Nemet, G., & Wilson, C. (2012). The energy technology innovation system. *Annual review of environment and resources,* 37(1), 137-162.

Government of India (2022). India's Updated First Nationally Determined Contribution Under Paris Agreement.

International Energy Agency (2023). Energy-intensive economic growth, compounded by unfavourable weather, pushed emissions up in China and India.

John Reed, Jyotsna Singh & Kris Kay (Financial Times, 2024). India's economic mismatch: not enough jobs and not enough workers.

Maamoun, N., Chitkara, P., Yang, J., Shrimali, G., Busby, J., Shidore, S., ... & Urpelainen, J. (2022). Identifying coal plants for early retirement in India: a multidimensional analysis of technical, economic, and environmental factors. *Applied Energy,* 312, 118644.

Ministry of Environment, Forestry and Climate Change, Government of India (2021). Third Biennial Update Report to the United Nations Framework Convention on Climate Change.

Ministry of Power, Government of India. Power Sector at a Glance.

Narassimhan, E., Gallagher, K. S., Koester, S., & Alejo, J. R. (2018). Carbon pricing in practice: A review of existing emissions trading systems. *Climate Policy,* 18(8), 967-991.

Nemet, G. F. (2009). Demand-pull, technology-push, and government-led incentives for non-incremental technical change. *Research policy,* 38(5), 700-709.

Press Information Bureau (2023). Ministry of Power & Ministry of Environment, Forests & Climate Change to develop Carbon Credit Trading Scheme for Decarbonisation.

Press Information Bureau (2024). Year End Review 2023 of Ministry of New & Renewable Energy.

Reserve Bank of India (2023). Developments in India's Balance of Payments during the Second Quarter (July-September) of 2023-24.

Reserve Bank of India (2023). Report on Currency and Finance (RCF) for the year 2022-23.

Yin, H., McDuffie, E. E., Martin, R. V., & Brauer, M. (2024). Global health costs of ambient PM2· 5 from combustion sources: a modelling study supporting air pollution control strategies. *The Lancet Planetary Health,* 8(7), e476-e488.