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India: Climate Change Issues

Global climate change presents multiple challenges to India. The country is faced with meeting its energy and economic development needs, reducing its greenhouse gas (GHG) emissions, and addressing the potential impacts of climate change. India is among the world's top emitters of GHGs, including carbon dioxide (CO_2), along with China, the United States, and the European Union; thus, India's participation in global efforts to mitigate climate change would be crucial to their success. India accounted for 17.5% of the world's population and 7% of global CO_2 emissions in 2021, although its CO_2 emissions per capita are comparatively low. Energy use in India has roughly doubled since 2000. The country's reliance on coal and other fossil fuels results in India emitting more GHGs per unit of energy generated than many other large countries.

Impact of Climate Change

India also is increasingly vulnerable to the effects of climate change. According to a 2021 Indian government overview of the country's National Action Plan on Climate Change (NAPCC), "Climate change is one of the most critical global challenges of our times. Recent events have emphatically demonstrated our growing vulnerability to climate change. Climate change impacts will range from affecting agriculture—further endangering food security—to sea-level rise and the accelerated erosion of coastal zones, increasing intensity of natural disasters, species extinction, and the spread of vector-borne diseases."

The Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report, *Climate Change 2023: Synthesis Report*, provides both observations and projections of potential impacts of climate change on India. The report states that observed adverse impacts of climate change on Asia include increased heat, malnutrition, and harm from wildlife; worsening mental health; displacement of people; and flood- and storm-induced damages in coastal areas. Additionally, the report states the following as key risks for Asia: flooding and infrastructure damage; biodiversity loss across freshwater, land, and ocean ecosystems; increase in frequency and extensiveness of coral bleaching; reduced coastal fishery resources; and decreased food and water security. The report also projects that 26% more people will be exposed to sea level rise from 2020 to 2040 in Asia.

Domestic Climate Policies

India's 1.4 billion people and growing middle class continue to create increased energy demands and resulting GHG emissions. According to the International Energy Agency's (IEA's) *India Energy Outlook 2021*, to meet projected growth in electricity demand over the next 20 years, India would need to add a power system the size of the European Union's. Rapid industrialization and urbanization likely will continue to create large energy demands, perhaps most notably in the area of space cooling.

By many accounts, transition away from coal to renewables is among the most important tasks facing Indian leaders as they address climate change and reform India's energy sector. Coal accounts for roughly half of India's total installed generation capacity. Both IEA and Indian government officials project that India will continue to rely on coal as a primary source of energy, even as coal's share of power generation may decline. In 2022, India's Minister of Coal, Mines, and Parliamentary Affairs reportedly stated that "no transition away from coal is happening in the foreseeable future in India," with coal expected to play a central role in India's energy mix beyond 2040. At the same time, India's renewable energy sector is growing rapidly, and the potential exists for further expansion of this sector, including with solar, wind, and hydropower sources.

Selected Climate Change Policy Initiatives in India

In addition to efforts outlined in the NAPCC and India's Nationally Determined Contribution (NDC), the IEA has identified the following announced policy initiatives as key to reducing India's emissions:

- Net Zero Emissions by 2070 (announced in 2021);
- Renewable energy and transmission targets, including aims to raise power generation from non-fossil sources to 50% of all capacity (from 42% at present) and achieve 500 GW of non-fossil capacity by 2030;
- Production-Linked Incentives, such as subsidies toward creation of new manufacturing of solar photovoltaic (PV) modules and modern batteries;
- a National Green Hydrogen Mission funded with $2.3 billion to support production, use, and exports targeted at five million tons annually; and
- a Carbon Market authorized by India's Energy Conservation (Amendment) Act, 2022, which allows the government to provide for a carbon-trading scheme.

Source: International Energy Agency, *World Energy Outlook 2023*

India's pledge to attain 500 gigawatts (GW) of non-fossil fuel energy generation by 2030 will require more than doubling current capacity of 186 GW (including 7.5 GW from nuclear power). Over half of this targeted addition is to come from the solar sector. According to the Ministry of Power, 72 GW of solar photovoltaic currently accounts for about 17% of India's total installed capacity. A National Solar Mission, one of the eight Missions under India's NAPCC, targets 100 GW of grid-connected solar power by 2030. With 44 GW at present, wind power accounts for 10% of total capacity; the government aspires to generate 150 GW from wind by 2030. Including hydropower, renewable energy sources now provide 42% of India's total installed capacity.

Approach to COP Negotiations

At COP27, India announced the submission of their Long-Term Low Emission Development Strategy (LT-LEDS) to the UNFCCC. This document outlines how they will meet their decarbonization pledge announced in 2021. The six key areas of India's LT-LEDS are energy security, transportation, urbanization, industrial sectors, forestry, and climate finance.

India has for decades argued that developed countries caused the current climate crisis and should thus take the bulk of responsibility for mitigating it, and that developed countries should also support developing countries' climate mitigation efforts financially and technologically. The LT-LEDS and press release announcing the LT-LEDS emphasize this point. The LT-LEDS says there are "shortcomings in the scope, scale, and speed of the climate finance made available to developing countries from developed countries" and "shortcomings in defining, tracking, and reporting" climate finance. The documents also state that climate finance is skewed toward mitigation rather than adaptation, "with adverse implications for developing countries facing climate-induced disasters."

In his speech at the COP26 summit in 2021, Indian Prime Minister Narendra Modi said, "India expects developed countries to make $1 trillion available as climate finance as soon as possible. As we track the progress of climate mitigation, we must also track climate finance." Ahead of COP28, India and the UAE released a joint statement on climate change, urging Parties to the Paris Agreement to operationalize the loss and damage fund established at COP27. This fund is intended to be used by low-income countries to cope with the financial impacts of climate change. Loss and damage is a key focus area of debate between developing and developed countries at COP28.

Nationally Determined Contribution (NDC)

India updated its NDC in August 2022 ahead of COP27. The NDC states India will reduce the emissions intensity of its gross domestic product by 45% by 2030 from 2005 levels. The update also includes a pledge to derive 50% of the country's electric power from non-fossil fuel-based resources by 2030. India's NDC pledge does not include a quantifiable target for 2030 emissions. The IEA's *World Energy Outlook 2023* projects India's CO_2 emissions will rise nearly 30% by 2050, one of the largest country increases.

Cooperation with the United States

The Biden Administration has expressed support for India's goal of installing 500 GW of renewable energy by 2030 and its long-term vision to achieve net-zero emissions by 2070. In 2021, President Biden and Prime Minister Modi established the U.S.-India Climate and Clean Energy Agenda 2030 Partnership with two tracks. The first, a Strategic Clean Energy Partnership (SCEP), "focuses government, industry, and other stakeholder efforts to advance energy security, clean energy innovation, and decarbonization efforts to support the energy transition while ensuring clean energy access." The Department of Energy is the lead U.S. agency. SCEP works on five "pillars": Responsible Oil and Gas; Power and Energy Efficiency; Renewable Energy; Sustainable Growth; and Emerging Fuels and Technology. Under the SCEP, a new Renewable Energy Technology Action Platform (RETAP) met for the first time in August 2023. The two governments are also seeking to increase minerals security cooperation to advance shared clean energy goals, including through the Minerals Security Partnership.

During a 2021 visit to New Delhi, U.S. Special Presidential Envoy for Climate John Kerry joined Indian officials in launching the second track of the partnership: a bilateral Climate Action and Finance Mobilization Dialogue, with the Departments of State and the Treasury as lead U.S. agencies. U.S. efforts include a $500 million U.S. International Development Finance Corporation loan to build solar panels in India. This mechanism has seen limited success to date, and India is able to finance only a small percentage of the $100 billion or more it reportedly will need annually to meet its net-zero by 2070 goal. Kerry, at a July 2023 G20 meeting on climate issues, said, "[We] have an imperative [at COP28] to try to establish a better finance track in order for emerging economies and less developed countries to be able to make the transition."

The Quadrilateral Security Dialogue or "Quad" is another mechanism through which the United States and India—along with Japan and Australia—are undertaking initiatives to address climate change. In 2022, Quad leaders launched a new "Quad Climate Change Adaptation and Mitigation Package" to enhance climate and clean energy cooperation, as well as promote adaptation and resilience. Among other developments at a May 2023 Quad summit meeting, the four leaders issued a Statement of Principles on Clean Energy Supply Chains in the Indo-Pacific and announced a Clean Energy Supply Chains initiative designed to accelerate the region's clean energy transition.

In the 118th Congress, S. 1720, the Indo-Pacific Strategic Energy Initiative Act—"To provide support for energy infrastructure projects in the Indo-Pacific region," including India—was introduced in May 2023. If enacted, this bill would provide political and diplomatic support for new energy infrastructure projects, particularly natural gas.

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