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Renewed U.S.-India Climate Cooperation

Mobilizing Foreign Capital for a Green Transition in India

By Kanika Chawla, Alan Yu, and Rita Cliffton
Center for American Progress, Council on Energy, Environment and Water
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Contents

The Center for American Progress (CAP) and India's Council on Energy, Environment and Water (CEEW) co-authored this report on renewed U.S.-India climate collaboration. This report aims to advance both organizations' missions to recommend bold, progressive policy ideas for both countries in order to deepen their work together to combat climate change. CAP and CEEW, representing leading think tanks from the United States and India, partnered in policy research and developed shared recommendations to position the United States and India as climate collaborators early in the new U.S. administration. CAP's long-standing policy interest in advocating ambitious solutions to combat climate change both domestically and internationally aligns with CEEW's policy interest in accelerating the energy transition in emerging economies.

Executive summary

President Joe Biden and Prime Minister Narendra Modi, affirming their commitment to the U.S.-India relationship, have identified tackling the threat of climate change as one of their top bilateral priorities. The United States and India have respective and shared interests in making climate change cooperation a central pillar of the strategic partnership. Such deepened cooperation would:

- **Advance global climate progress and Paris Agreement goals by ramping up action in India:** The pace of the United States' decarbonization strategy and India's clean energy transition will be critical in order for the world to be compliant with the Paris Agreement. U.S.-India collaboration on policies, technologies, and financing can support aggressive domestic economic and energy transformations.
- **Demonstrate climate collaboration:** As the United States and India pursue economic recovery, they can consult on, learn from, and demonstrate model sustainability-centered, climate-focused pathways for developed and developing economies.
- **Affirm shared global climate leadership:** As the United States works to restore its international credibility on climate action, the world will be watching the nature of its collaborations globally, particularly with developing countries such as India.
- **Create economic opportunities:** A reinvigorated climate partnership would broaden India's access to the technological and financial resources required to support its sustainable development and decarbonization strategies and would deepen access for U.S. businesses.
- **Advance geostrategic interests:** A strengthened climate partnership also would advance the U.S. and Indian governments' respective and shared geostrategic interests.

A linchpin factor for realizing the above outcomes will be solving the deep shortfall in private financing for India's sustainable development and clean energy transition. For India, the requirement for quantum acceleration of financing is obvious. For investors, infrastructure in emerging markets represents one of the highest long-term return on investment potentials. But financing for green infrastructure lags, market failures serve as barriers to investment, and new economic uncertainties could complicate investor confidence. It is in this setting that governments must create new means to catalyze investment flows.

The government of India holds the keys to the important steps that could lower barriers to progress. The United States can play an important partnership role. The Center for American Progress (CAP) and India's Council on Energy, Environment and Water (CEEW) recommend that President Biden and Prime Minister Modi lead the creation of the U.S.-India Green Transition Finance Initiative, which would make mobilizing private finance for India's green transition the centerpiece of this new leaders-level climate change strategy. CAP and CEEW recommend a two-step strategy of sustainable sector prioritization and holistic strategies and actions to de-risk the identified sectors.

The financing imperative: India's green transition requires extensive financing

India, the world's fifth-most-vulnerable nation to climate change impacts, faces a risk of a 2.5 percent to 4.5 percent hit to annual gross domestic product (GDP) from impacts from extreme weather, food shortage, heat stress, and public health. Three-quarters of India's 700 or more districts, home to 638 million people, have been identified as hot spots for extreme climate events. Under the Paris Agreement, India pledged to take a series of actions by 2030 on carbon intensity, power sector decarbonization, and carbon sinks, and the country is on track to meet those targets. Post-Paris Agreement, India has made more ambitious pledges, particularly in power sector decarbonization, but recognizing that those outcomes would require $2.5 trillion in finance by 2030. Climate-related investments—from both public and private sources—remain limited. With increasing ambition, the total investment opportunity keeps growing, making capital mobilization at scale critical and daunting.

The financing obstacle: Risk and its role in shaping investment decisions

A number of risk-related obstacles continue to hinder the quantum of financial flows required to finance green transition projects and the terms at which this capital is available. India's high risk rating acts as a deterrent, shrinking the available capital pool by excluding some institutional capital and investors and generating higher risk premiums, limiting the affordability of capital. Perceived and real risks create dual capital availability and affordability constraints, hindering green transition finance mobilization.

U.S. institutional investors, holding $26 trillion in assets as of 2020, are increasingly prioritizing environmental, social, and governance (ESG) considerations, and, with the COVID-19-induced downturn in the global economy, these investors are looking for robust avenues for returns. India's green transition offers opportunities to respond to both objectives. The policy challenge is how to address perceived risk assessments and what actions to take to lower real risks, in order to improve the attractiveness of investment opportunities across India's immense green transition landscape. This report outlines some recommended actions for the two governments.

Key sector-specific and country-level sustainable development investment risk factors

India's sustainable finance sector faces a number of risk-related challenges. The most prevalent sector-specific and country-level investment risks are: off-taker risk of power-producing counterparties failing to comply with contract terms; risk from lower-than-forecasted energy and electricity demand; change-in-law risk; and foreign exchange risk due to emerging market currency fluctuations.

The financing enabler: Government and prioritizing sectors for investment

India's renewable energy transition experience so far has demonstrated the critical role of domestic priorities in driving climate-compliant action. But India's green transition financing needs go beyond power generation and are diverse—from enhancing the quantum and affordability of existing flows for commercially proven segments to unlocking finance flows for underserved and/or emerging sectors. To direct resource flows and development efficiently, India must identify priority green sectors, keeping in view the domestic value that would accrue. This requires a strategic green industrial policy that identifies and sequences national priorities, sets clear targets, displays long-term vision, and rewards innovation.

Market participants, both within and outside India, consistently raise concerns over the lack of clarity about what constitutes "green." Clear definitions help in identifying, deploying, measuring, attracting, and tracking capital according to standardized, comparable norms—important for bond issuers, investors, policymakers, and regulators. In 2017, the Securities and Exchange Board of India (SEBI) sought to regularize

green bond issuances under its publication "Disclosure Requirements for Issuance and Listing of Green Debt Securities." CEEW identified this as a necessary and progressive step but insufficient to drive the market in the absence of other enabling measures. The SEBI guidelines need to be strengthened with thresholds and performance standards to assess the assets underlying the bond.

The financing opportunities: Power generation and electric mobility

India's sustainable finance landscape ranges from the advanced and robust investment climate in the power generation sector to underinvested sectors such as electric mobility, which offer expansive investment opportunities. Both sectors face different opportunities for U.S.-India green finance collaboration and challenges for governments and investors.

For India's clean power transition, investor response to policy and price signals—as well as the maturing of the renewable electricity market and corresponding de-risking—has resulted in a doubling of investment in the renewable power sector over the past five years. Notwithstanding the tremendous investment shifts toward renewable energy, these flows will have to triple from present levels for India to realize its 2030 deployment ambitions. However, the prohibitively high cost of borrowing serves as a bottleneck. A U.S.-India collaborative initiative aimed at addressing the financial risks plaguing the quantity and price of debt could alleviate the limiting factors of India's energy transition.

Catalyzing finance flows will be a critical factor for new and underserved segments of India's green transition, such as electric mobility. The current market outlook for electric vehicles (EVs) falls far short of policy benchmarks set for 2030, based on projections that the overall EV consumer market in 2030 could be as large as $206 billion cumulatively. India's electric mobility transition represents an opportunity to drive significant economic growth, with investment needs of more than $180 billion in vehicle production and charging infrastructure in the coming decade alone. For the auto loan market, CEEW finds that the banking sector would need to more than triple its current advances of $31 billion toward vehicle loans over the next 10 years in order to achieve vehicle electrification goals.

Recommendations: An ambitious U.S.-India sustainable finance agenda

Prime Minister Modi and President Biden should agree early in the new U.S. administration on a high-level strategy to mobilize international flows. Such a strong public declaration of Indian and U.S. policy and resource commitment will be a critical first signal to private international investors. The declaration should explain where the government of India sees prioritized action, what actions each government will take, and what actions it expects of foreign and domestic stakeholders.

CAP and CEEW recommend that the government of India launch a process to identify prioritized green transition sectors for investment. The two governments must then focus on a comprehensive strategy to de-risk the investment environment for those prioritized sectors.

Leadership and accountability will be critical elements in driving prompt and concrete results. This report recommends that the leaders set clear and ambitious timelines and performance standards. To ensure accountability, the leaders should task appropriate senior officials to lead on action. These officials should include India's minister of state for new and renewable energy and the United States' special presidential envoy for climate change, as well as the U.S. International Development Finance Corp. chairman and Indian secretary of the Ministry of Finance Department of Economic Affairs.

CAP and CEEW propose joint interventions and mechanisms focused on deepening green finance markets in India and developing functional and mutually beneficial interlinkages between U.S. private capital and India's green investment opportunities. Further collaboration could include:

- **Green tagging:** This is a government tool to increase visibility of assets and their climate impact for potential investors.

- **Strategic de-risking:** To circumvent risks that impede sustainable investments, targeted de-risking tools could leverage small amounts of public capital to circumvent risks in the short to medium run, while risk obstacles that require more systemic corrections and have long gestation periods are addressed. De-risking instruments take many forms, such as publicly funded credit enhancement interventions, philanthropic and privately funded catalytic financing interventions, and a payment security mechanism 2.0.

- **Roadshows and matchmaking:** The governments could create accelerator programs for market scaling of proven technology developed in the United States, India, or jointly, which could then be showcased to venture capital and early-stage investors through a marketplace facilitated by the U.S. and Indian governments. This would create a conducive environment for scaling research and development efforts and matchmaking them with interested investors.

- **Greening finance flows through enhanced financial regulation:** The governments could coordinate engagement at multilateral initiatives such as the Network for Greening the Financial System and the Basel Committee on Banking Supervision to increase their collective influence and provide benefits, including capacity building, standard setting, and international credibility.

- **Green banks and windows:** The government of India should assess platforms to develop and deploy catalytic finance instruments within or alongside existing public sector financial institutions such as the Indian Renewable Energy Development Agency Ltd. (IREDA) or the National Bank for Agriculture and Rural Development (NABARD), in order to help expand clean energy markets within their purview.

- **Green securitization:** The government of India and the U.S. government could use public funds to create pipelines of securitized, operationally low-risk green projects, such as cash flows from solar assets, to free up capital for new projects and/or develop a small guarantor facility to underwrite the risks of such securities.

This report begins with an overview of the imperative for catalyzing finance to India's green transition. It then outlines the critical role that investor risk assessment plays in dampening financial flows and some solutions that the government of India has taken. The report discusses the enabling role that the Indian government can take in identifying prioritized green sectors for investment flows. It also highlights the positive example of finance flows to renewable power generation, while acknowledging continuing challenges, and the latent finance opportunities in India's EV sector. The report concludes with a proposed strategy for elevated and concerted Indian and U.S. government action to catalyze foreign financial investment to drive India's green transition.

Introduction

In their first conversation this month as heads of government, President Joe Biden and Prime Minister Narendra Modi[1] affirmed their commitment to the bilateral relationship and identified tackling the threat of climate change and launching the global economic recovery among their top priorities. Their exchange demonstrated the respective and shared interests of the United States and India to make climate change cooperation a central pillar of their partnership.

The policy imperatives are clear. To stabilize global temperature rise to no greater than 1.5 degrees Celsius by midcentury, it will be in India and the world's interest for India to move to an increasingly progressive decarbonization pathway, with urgent actions and investments required over the next 10 years. This is why deepened cooperation between the United States and India is pivotal, as it would:

- **Advance global climate progress and Paris Agreement goals by ramping up action in India:** No global solution to climate change is possible without action and progress from the United States and India, the world's second- and fourth-largest greenhouse gas-emitting economies, respectively. The pace of the United States' decarbonization strategy and India's energy transition will be critical in order for the world to be compliant with the Paris Agreement. Working together on policies, technologies, and financing can support aggressive domestic economic and energy transformations, which again can serve as model approaches elsewhere.

- **Demonstrate climate collaboration:** As the United States and India pursue economic recovery, they can consult on, learn from, and demonstrate model sustainability-centered, climate-focused pathways for developed and developing economies—particularly to those with growing energy demand and potential clean energy projects in need of matchmaking in the form of aggregation and de-risking. This would offer a functional solution to address several complex equity-based challenges that act as major barriers to clean energy market development.

- **Affirm shared global climate leadership:** As the United States works to restore its international credibility on climate action, the world will be watching the nature of its collaborations globally, particularly with developing countries such as India. India also has and values a seat at the climate leadership table. A renewed, robust U.S.-India climate partnership would signal their ambition and collaborative approach to climate action, contribute to climate progress in India, and demonstrate the United States' commitment to return to global cooperation.

- **Create economic opportunities:** A reinvigorated climate partnership would broaden India's access to the technological and financial resources required to support its sustainable development and decarbonization strategies. A collaboration that creates well-functioning Indian clean energy markets and opportunities for U.S. investors and capital has important co-benefits of economic growth in India and deepened access for U.S. business to one of the world's largest markets.

- **Advance geostrategic interests:** A strengthened climate partnership would also advance the U.S. and Indian governments' respective and shared geostrategic interests.

A linchpin factor for realizing the above outcomes will be solving the deep shortfall in available private financing for India's sustainable development and clean energy transition. Political will, public support, and technological solutions are all on the positive side. Solve the financial shortfall problem, and both India and the United States could realize the shared and respective benefits outlined above. But how?

COVID-19's economic upheaval underscores a critical opportunity for governments and private investors to mobilize private finance and build back in a more sustainably and economically sound manner. For resource-constrained countries such as India, the requirement for quantum acceleration of international financing, particularly from institutional investors, to drive sustainable infrastructure development is obvious and growing.

For investors, infrastructure development in emerging markets represents one of the highest long-term return on investment potentials, with growing demand for sustainable investment opportunities. In 2020, U.S. institutional investors collectively managed approximately $26 trillion worth of assets.[2] And institutional investments with ESG considerations have surged in recent years.[3] Between 2016 and 2020, total U.S. sustainably invested institutional assets grew 30 percent, from $4.72 trillion to $6.18 trillion.[4]

These institutional investors are increasingly looking for asset classes that can deliver steady returns in the current downturn economy. Clean energy projects can, in particular, provide institutional investors with opportunities that are bankable; offer stable and predictable cash flows, often with inflation protection; and include long-term contracts with power purchasers and government support.[5] However, financial flows to green infrastructure lag, a range of market failures serve as barriers to investment, and new economic uncertainties could complicate investor confidence. It is in this setting that governments must create new means to catalyze investment flows.

The government of India holds the keys to the important steps that could lower barriers to progress. The United States can play an important partnership role. With the opportunity for renewed and enhanced U.S.-India climate change cooperation now that President Biden has taken office, he and Prime Minister Modi should create a new bilateral climate change strategy with joint leadership to mobilize private finance for India's green transition.

This report broadly defines green transition finance as resources addressing India's clean energy sector, as well as emerging and underserved sectors such as electric mobility, energy efficiency, natural resource management, industry, buildings and sustainable infrastructure, and climate adaptation.[6]

CAP and CEEW see a two-step strategy of sector prioritization and holistic strategies and actions to de-risk the identified sectors as the right formula for rapidly catalyzing private investment in India's green transition strategy. India's industry and subnational governments, along with foreign governments, multilateral institutions, banks, investors, and international project developers, all seek clarity on what India deems prioritized sectors for green transition, in addition to the renewable energy sector. The ambiguity is a hindrance to investment. CAP and CEEW recommend that India clearly state its prioritized clean energy sectors and its transition pathway such that partner countries and foreign investors can identify areas of mutual interest. Furthermore, the United States and India should collaborate on a number of initiatives to de-risk India's stated prioritized clean energy and green transition sectors, in order to create the conditions to drive foreign institutional investment flows to these opportunities.

Geostrategic objectives and impacts of the U.S.-India Green Transition Finance Initiative

A major U.S.-India partnership around climate,[7] with a key deliverable of bilateral collaboration to catalyze trillions of dollars of clean energy finance, could also provide a high-leverage response to some likely emerging dynamics between the United States and India.

In addition to their shared commitment to protect their own citizens and the global community from the ravages of unrestrained climate chaos, a U.S.-India partnership should take into account what might be called the climate-plus shared interests in advancing climate action together:

- Both the United States and India seek inclusive Asian community partnerships to resolve a variety of interrelated issues: climate pollution, public health, economic competitiveness, regional multilateral collaboration, and concerns over the role of other regional stakeholders, including China.

- Both countries are evaluating industrial policy-based approaches to strengthen their respective manufacturing job bases. They face different challenges in building manufacturing employment, but those challenges do not necessarily position the two countries in fundamental conflict. They can, by collaborating, both emerge with stronger manufacturing sectors, as long as this objective is pursued in the design of the relationship.

- Similarly, faced with a global need for clean energy innovation, research, development, and deployment, India and the United States should explore joint innovation research projects that would marry their respective comparative advantages. The United States has had research successes such as the Advanced Research Projects Agency–Energy (ARPA-E) advanced battery program in early-stage innovation. India led the world in showing how deployment could make LED lighting the mainstream technology of choice; its success at using reverse auctions to bring down the price of wind and solar are similarly best in class.[8] Moreover, India has developed a new Science, Technology, and Innovation Policy 2020, with a strong focus on climate and clean energy innovation.[9]

The financing imperative: India's green transition requires extensive financing

India, the world's fifth-most-vulnerable nation to climate change impacts, confronts a risk of a 2.5 percent to 4.5 percent hit to its annual GDP from impacts of extreme weather, food shortage, heat stress, and public health.[10] Three-quarters of India's 700 or more districts, home to 638 million people, have been identified as hot spots for extreme climate events.[11] As part of its nationally determined contribution under the Paris Agreement, India has pledged to take a series of concrete actions by 2030 on carbon intensity, power sector decarbonization, and carbon sinks.[12] These commitments were conditional on technology transfer and international climate finance support, but even without this, India is well on its way to reach these targets. Since Paris, India has made more ambitious commitments, especially on power system decarbonization, but realizing these post-Paris Agreement commitments would require India to invest $2.5 trillion over the 2016 to 2030 period.[13] Climate-related investments—from public and private sources—remain limited, and with increasing ambition, the total investment opportunity keeps growing, making the task of mobilizing capital at scale both critical and daunting.

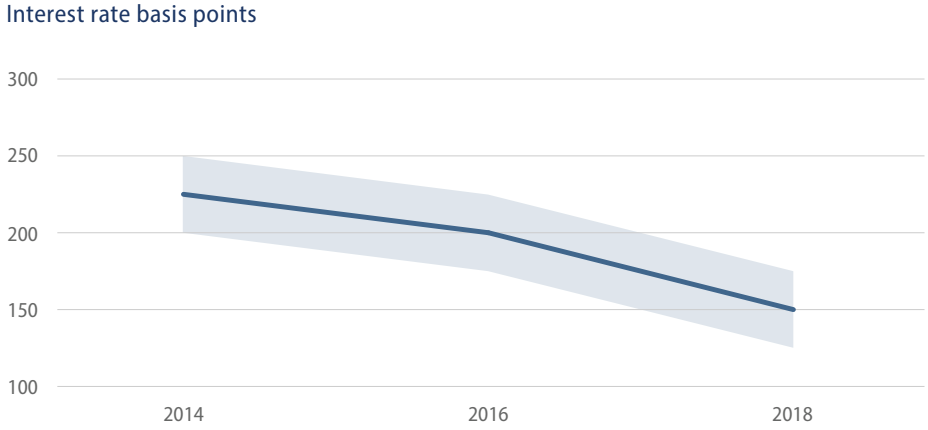
When the Conference of Parties for the U.N. Framework Convention on Climate Change met more than 10 years ago in Copenhagen, developed countries promised to make $100 billion in climate finance available annually by 2020. Since then, climate negotiators have failed to achieve the principal task of defining what constitutes climate finance or what sources of funds would make up for the promised pledge. From 2013 to 2018, multilateral climate funds approved $10.4 billion for mitigation activities.[14] Even including bilateral funds and private investment, climate financing by one count was $463 billion in 2016.[15] As large as this number looks, it is woefully inadequate, particularly when measured against India's $2.5 trillion climate finance gap.

The financing obstacle: Risk and its role in shaping investment decisions

A number of risk-related obstacles continue to hinder the quantum of financial flows required to finance sustainable development projects in India and the terms at which this capital is available. India's high risk rating acts as a deterrent, effectively excluding several large pools of institutional capital and other investors with lower risk appetites, thus shrinking the available funding pool and keeping the cost of capital high for participating financing. For example, financing costs account for nearly 60 percent of the levelized cost of renewable electricity (LCOE) in India, while equipment costs—which have historically been major drivers of renewable energy tariff reductions—account for less than 20 percent of the LCOE.[16] With a high share of the tariff being the cost of capital, even big drops in equipment costs would not make much difference in lowering overall renewable energy tariffs.[17] During the 2014 to 2018 period, as India added large capacities of utility-scale solar and wind power, interest rate spreads for both declined by 75 to 125 basis points, indicative of a relatively significant decline in risk premiums.[18] This can be attributed to a growing familiarity with the technologies and a decline in lenders' perception of risk, demonstrative of a learning curve of capital that is likely to continue a downward trend as the clean energy market matures and deepens.

FIGURE 1

Interest rate spreads for solar and wind power in India, 2014–2018



Source: Arjun Dutt, Lucila Arboleya, and Barath Mahadevan, "Clean Energy Investment Trends 2019: Evolving Risk Perceptions for India's Grid-Connected Renewable Power Projects" (New Delhi: Council on Energy, Environment and Water and Paris: International Energy Agency, 2019), available at https://www.ceew.in/sites/default/files/CEEW-Clean-Energy-Investment-Trends-2019.pdf.

Emerging economies such as India face a twofold risk perception challenge: the ubiquitous perception of risk given investors' limited familiarity with many of these sustainable market sectors, which is further exacerbated by the perception of macroeconomic country risk for emerging economies such as India.

India's green transition finance constraints can be characterized in two categories:

- **Availability:** Many foreign investors, especially those with limited risk appetites such as institutional investors, do not consider investing in emerging economies, limiting the supply of equity for green transition investment in India. There is an absence of strong and robust investment-grade project pipelines because investors often overestimate sectoral risks.

- **Affordability:** Capital that does move into India's renewable energy market is often priced prohibitively high due to overestimated real and perceived risks. The cost competitiveness of renewable energy tariffs poses a major detriment to capacity addition.

Enhanced data availability and proof of concept in many of these sectors can continue to respond to these risk perception challenges.

Key sector-specific and country-level sustainable development investment risk factors

Beyond its perceived risk-related challenges, India's sustainable infrastructure investment landscape is also characterized by actual risk factors, which can be categorized as sector-specific and country-level risks.[19] Each type influences sustainable development financing decisions. Below are the four most prevalent investment risks in India's green transition finance picture.

Sector-specific risks

Off-taker risks: This is the risk of power-producing counterparties failing to comply with contract terms due to payment delays, renegotiation, and cancellations. In India, typical power purchasers are public sector distribution companies (discoms), many of which are in poor financial health because of inadequate tariff collections, delays in public subsidy transfers, and large technical and commercial losses.[20] The discoms are the weakest link of the power system, both because they are unreliable

partners for project developers and due to the political pressures and regulatory limitations they face to bear nonmarket-reflective pricing. The low creditworthiness of discoms is a source of competitive disadvantage vis-a-vis other better-rated infrastructure projects, and it hinders renewable energy capacity addition.

Off-taker risk, stemming mostly from discoms' payment delays, has been a major concern for developers and investors. Since 2017, the government has been experimenting with a variety of mechanisms to underwrite this risk through India's central agency, Solar Energy Corporation of India; signing power purchase agreements (PPA) with developers; and leveraging the central government's influence over states to secure power sale agreements that discoms are unlikely to renege on. This helps developers receive payments on time for centrally tendered projects. India is also piloting some business model innovations to free renewable energy projects from long-term PPAs so that the country can instead focus on decentralized and distributed end-consumer solutions.

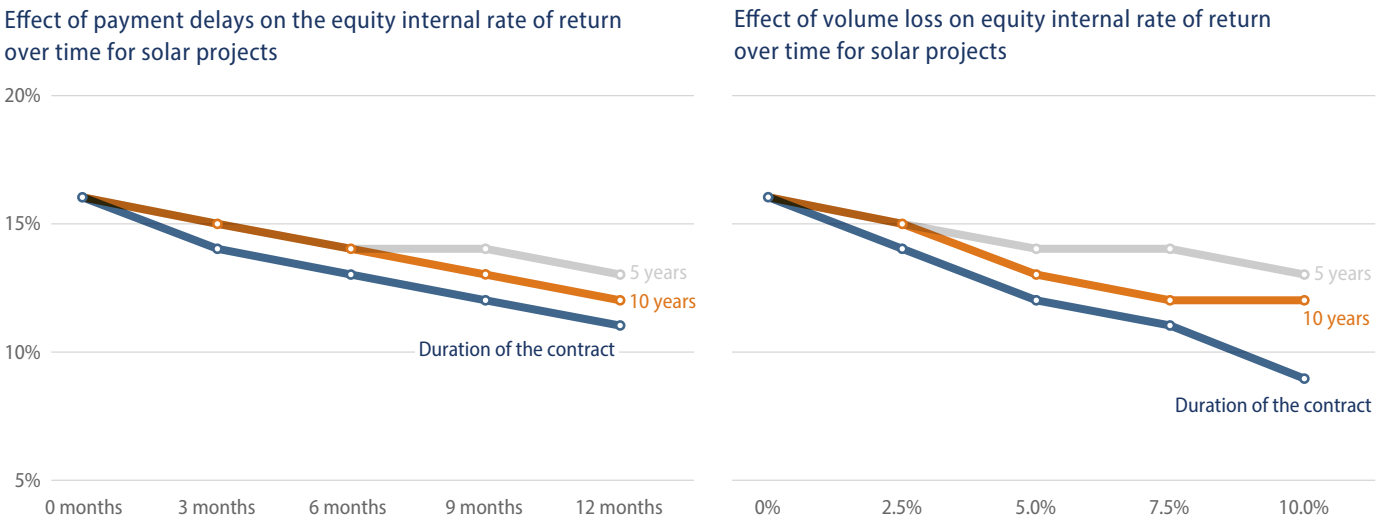
For solar projects, payment delays can reduce the equity internal rate of return (IRR) by up to 140 basis points per every three months of delay and by 90 basis points per every three months in the case for wind projects. (see Figure 2) These short-term risks can have a considerable impact, given the current COVID-19 economic downturn. A one-year payment delay can lead to a loss of more than 500 basis points in the equity IRR, despite the existence of grace periods for debt—typically one year for the principal, with accrued interest.

In the case of curtailment, the equity IRR is affected by around 180 basis points per every 2.5 percent of production lost for solar photovoltaic projects and by around 130 basis points in the case of wind. (see Figure 2) The direct impact of the COVID-19 pandemic on electricity demand may lead to reduced available hours for all generators, with potential knock-on effects for renewables in the absence of reliable dispatch and continued reform efforts to improve flexible system operation.

Payment security mechanisms, another approach introduced in 2019 to circumvent off-taker risk, mandates that discoms open and maintain an adequate letter of credit under PPAs with generating firms. Such a mechanism has been used successfully in several infrastructure sectors but remains relatively inconsequential in addressing the systemic concern posed by the poor financial health of discoms. The recommendations section in this report includes a proposal for a more transparent and bespoke approach on payment security mechanisms.

FIGURE 2

Payment delays and curtailment risks significantly reduce returns for renewables



Source: Arjun Dutt, Lucila Arboleya, and Pablo Gonzalez, "Clean Energy investment Trends 2020: Mapping Project-Level Fiancial Performance Expectations in India" (New Delhi: Council on Energy, Environment and Water and Paris: International Energy Agency, 2019), available at https://cef.ceew.in/solutions-factory/CEEW-CEF-clean-energy-investment-trends-2020.pdf.

The most visible examples of policy uncertainty risks are manifest in the tensions between the government's strong policy push to deploy renewables and discoms' unstable commercial viability. These policy uncertainty risks continue to limit sustainability applications until the economics of the transition become more compelling, and viable business models evolve.

Demand risks: This is the risk posed by lower-than-forecasted growth in energy and electricity demand. In India, electricity demand growth is closely aligned with the poor financial health of discoms. Given their precarious financial circumstances, discoms often arbitrarily cut off electricity purchases from generators for cash flow reasons rather than based on actual demand. The coronavirus crisis has had an adverse impact on energy demand around the world, and even as electricity demand in India has returned to pre-pandemic levels, its pace of growth has slowed. In this context, demand risk grows in India. Power producers cannot accurately factor cost-based curtailments into generation supply contracts, elevating financial return uncertainties for power producers and, in turn, investors.[21]

Country-level risks

Change-in-law risks: This risk, closely linked to off-taker risks, pertains to the strength and timeliness of mechanisms to enforce contracts and protect creditors. The government, aware of such risks, is pushing for reform, most notably in the recent Electricity Act Amendment Bill 2020. Similar to other long-term contracts, all PPAs include a strong change-in-law clause that allows compensation to the power producers in case of change in the circumstances, policies, incentives, and/or fiscal obligations during the course of the contract. (see text box)

Foreign exchange risks: These risks are posed by lower returns as a result of fluctuations in emerging market currencies. This is especially problematic in case capital is borrowed in hard currency but deployed in local currency. In the case of hard currency investments, this risk falls on the borrower. (see text box)

Change-in-law risk: The Andhra Pradesh case study

In July 2019, the incoming government of Andhra Pradesh (AP) signaled its intention to make regulatory changes that could have led to the retrospective cancellation or renegotiation of renewable energy contracts signed by the previous AP administration. Such a move would have put 7.4 gigawatts (GW) of installed solar and wind power capacity in jeopardy.[22] Central government authorities, especially the Ministry of New and Renewable Energy, strongly and publicly condemned the move, recognizing the implications for investor confidence in India's rule-of-law culture and the sanctity of contracts in the country's clean energy market, even beyond AP. The central government has been supportive of renewable energy developers seeking relief from the AP government.[23]

Indian courts have historically upheld the validity of existing contracts, barring cases of corruption. The AP High Court's October 2019 stay order against the renegotiation and cancellation of the PPAs in question has helped alleviate some of the immediate stress on the power developers, but the market continues to reel under the risk of renegotiation.[24]

Partially in response to this uncertainty, the central government has proposed amendments to the Electricity Act of 2003 with the aim of improving contract enforcement; mitigating off-taker and payment risk for renewables developers; and promoting renewable energy with a dedicated policy and obligations for discoms to procure hydropower.[25] However, this amendment has not yet been tabled in Parliament. State governments have voiced objections because of the centralization of authority on dispute resolution, which state regulators have traditionally addressed.

FIGURE 3

Foreign exchange rate fluctuations can increase risk for renewables

U.S. dollar-Indian rupee conversion rate, July 2019–January 2021

Source: Excelerates.com, "Download historical rates for USD - INR to excel," available at https://excelrates.com/historical-exchange-rates/USD-INR (last accessed February 2021)

How risky is foreign exchange risk for Indian investments?

Certain investors and analysts regularly cite apprehension over foreign exchange risk as a limiting factor for international investment flows into India. This is due to uncertain currency movements and potential lower returns from Indian rupee (INR) depreciation. The currency mismatch of debt financed in hard currencies and project revenues generated in INR exposes a project to foreign exchange risks. These analysts argue that the risk of INR-based revenue depreciation can affect investors' decisions and risk appetite.[26]

While it is important to recognize foreign exchange risks in the context of sustainable finance, these risks present a familiar macroeconomic challenge that many investors and stakeholders have the tools and experience necessary to address. Market mechanisms, such as currency swaps through a third-party provider, are often used to hedge this risk.

These instruments, as offered in the market today, are often seen to be prohibitively expensive, but their critical contribution is to ease the problem of accessing capital at scale from foreign markets, given the large quantum of debt required in India's clean energy scale-up. Domestic Indian capital sources are simply insufficient to match the resource need. The cost of borrowing in hard currency such as the U.S. dollar (USD) is significantly lower than domestic currency borrowing, but the price premium of the hedge takes away from the cost advantage of borrowing from international markets. It's the scale of foreign capital that India benefits from in accessing foreign capital sources.

Debt finance costs in India are priced considerably higher than those available in international markets and through multilateral development banks—where debt costs can be as low as 4 percent. But a currency swap takes away the cost advantage of foreign finance.[27] The typical cost of currency swapping in India is available at around 5 percent to 7 percent per year, making completely hedged foreign loans as expensive as domestic loans at an average rate of 12 percent to 13 percent.[28] In the current COVID-19 paradigm, market fluctuations have raised the price of hedges due to higher currency price fluctuation. However, the liquidity constraints in individual markets make accessing international markets for debt central to bypassing the debt availability challenge.

The financing enabler: Government of India and prioritizing sectors for investment

Investors will require the right policy signals in order to match resources with opportunities and priorities, given the range of market and nonmarket challenges as well as the sheer breadth and depth of the green transition financing gap. The government of India can serve that financing enabler function by signaling to investors its prioritized sectors for green transition investment and implementing the policies and setting the conditions to attract investors.

What are India's priority green sectors?

India's experience with the clean energy transition so far has demonstrated the critical role of domestic priorities in driving climate-aligned investment. The cost competitiveness and socioeconomic benefits of renewable energy have brought it from margin to mainstream in India's power sector. But India's green transition financing needs span beyond power generation and are diverse—from enhancing the quantum and affordability of existing flows for commercially proven segments to unlocking finance flows for underserved and/or emerging sectors such as electric mobility; distributed renewables; green hydrogen; decarbonizing of micro-, small-, and medium-scale enterprises; and energy storage, among others.

Each one of these sectors offers a large market opportunity for investors, businesses, and local communities. But the needs and opportunities across all these sectors are many and cannot all be met promptly and simultaneously. India has a wide variety of schemes and programs on sectors ranging from electric mobility to sustainable cooling. To direct resource flows and development efficiently, India must identify priority green sectors, keeping in view the domestic value that would accrue from them. This requires a strategic green industrial policy that identifies and sequences national priorities, sets clear targets, displays long-term vision, and rewards innovation. Prioritizing among them and establishing partnerships to leverage technology, finance, and interconnected global markets will be a central pivot in advancing India's clean energy priorities.

Priority sectors can be selected based on a balance of the following features:

1. Impact on greenhouse gas abatement (scale)
2. Socioeconomic benefits (direct jobs)
3. Local value creation (value chain creation and domestic manufacturing)
4. Catalytic impact (benefits for multiple sectors such as batteries for renewable energy and EVs)
5. Financial viability

Defining what is sustainable and green

Market participants, both within and outside India, consistently raise concerns over the lack of clarity about what constitutes "green."[29] Clear definitions help in identifying, deploying, measuring, attracting, and tracking capital according to standardized, comparable norms—important for bond issuers, investors, policymakers, and regulators.

In 2017, the Securities and Exchange Board of India sought to regularize green bond issuances under its publication "Disclosure Requirements for Issuance and Listing of Green Debt Securities."[30] CEEW identified this as a necessary and progressive step but insufficient to drive the market in the absence of other enabling measures.[31] The SEBI guidelines provide a list of green asset categories[32] and a process for issuers to follow to issue a green bond.[33] The guidelines are largely in line with international standards such as the Green Bond Principles and the Climate Bonds Initiative's taxonomy, but they need to be strengthened with thresholds and performance standards to assess the assets underlying the bond.[34]

A detailed set of standards, which establishes thresholds to achieve Paris Agreement targets, for example, would serve a useful function. Such standards can be designed to assess the greenness of projects and assets in a comparable way; bridge the gap between the information expected by investors and provided by issuers; provide comparable tracking of green finance mobilization and deployment; and help the issuing entity place itself at the appropriate position on a green scale and progress further on its decarbonization pathway.[35]

When combined with a clear national strategy for priority green sectors, the taxonomy could be leveraged to attract dedicated pools of green capital, provide fiscal incentives to create domestic interest in green investment opportunities, and create a liquid secondary market through green bonds and sovereign green gilts.

The financing opportunities: Power generation and electric mobility

India's sustainable finance landscape ranges from the advanced and robust investment climate in the power generation sector to its underinvested sectors such as electric mobility, which offer expansive investment opportunities. Each sector faces different opportunities for U.S.-India climate finance collaboration and challenges for governments and investors, as outlined below.

The continuing opportunity: India's clean power transition

India's electricity sector is leading the country's green transition. It also offers a complex picture of the obstacles to and potential for this transition. India runs the world's third-largest coal fleet, comprising 11 percent of the global total,[36] and continues to draw more than 70 percent of its power generation from thermal power. In the last two decades, thermal power experienced exponential but short-lived growth, with additions hitting a peak of 20 GW of new capacity annually from 2012 to 2016. Several of these projects are now in financial distress as plant load factors have fallen to an unprecedented low of 41.6 percent in April 2020—a 22.6 percent year-on-year decline from 2019.[37] (see text box)

A combination of government policy support for renewables deployment and pronounced cost declines is driving fundamental change in India's electricity market dynamics. The government's 2015 declaration that India would deploy 175 GW of renewables generation by 2022 was the most visible such policy signal.[38] Supporting policies, including adoption of competitive auction tenders for power generation awards, have driven solar photovoltaic project costs down by 80 percent over the 2010–2018 period.[39] And in 2019, domestic solar prices were 14 percent below the cost of existing coal-fired power plant generation costs per unit.[40] Although the COVID-19 pandemic has dealt a further blow to the financial viability of thermal power in India, the market disruption caused by the rapid drop in renewable energy prices cannot be overstated.

The convergence of policy signals and cost declines served to catalyze India's renewable installed capacity from 35.5 GW in 2014 to 86.8 GW in 2020.[41] India has set a clear path to address its future electricity demand growth through low-cost and lower-emission renewable sources.

TABLE 1

India nonfossil fuel power generation capacity growth by sector, 2014 and 2020

Sector	Installed gigawatt capacity		Percentage growth
	2014	2020	
Large hydro	40.5	45.4	12.10
Nuclear	4.8	6.8	41.67
Renewable energy, excluding large hydro	35.5	86.8	144.51
Solar power	*2.6*	*34.4*	*1223.08*
Wind power	*21.0*	*37.7*	*79.52*
Biomass, small hydro, and waste to energy	*11.9*	*14.7*	*23.53*
Total	**80.8**	**139.0**	**72.03**

Note: Small hydro produces less than 30 megawatts; large hydro produces more than 30 megawatts.

Source: Ministry of New and Renewable Energy, "Physical Progress," available at https://mnre.gov.in/the-ministry/physical-progress (last accessed February 2020).

The market response: An opportunity the market could not ignore

The investor response to the policy and price signals—as well as the maturing of the renewable energy market and corresponding de-risking—has resulted in a doubling of investment in India's renewable power sector over the past five years. Renewable power sector investment, which has surpassed thermal power capital expenditures,[42] reached $9.3 billion in 2019, with investments comprising $6.6 billion in solar and $2.2 billion in wind.[43] Annual renewable energy investments averaged $11.5 billion from 2014 to 2019, second only to China in the developing world but far short of the investment needed or the total clean energy investment made globally.[44]

The pace of India's renewable energy capacity addition is indicative of investor interest in the sector, but financing serves as a bottleneck for realizing its full potential. The cost of borrowing remains relatively high—between 10.5 percent and 11.15 percent, which is significant when compared with the current base repo rate—equivalent to the Federal Reserve-determined central bank borrowing rate for banks—of 4 percent.[45]

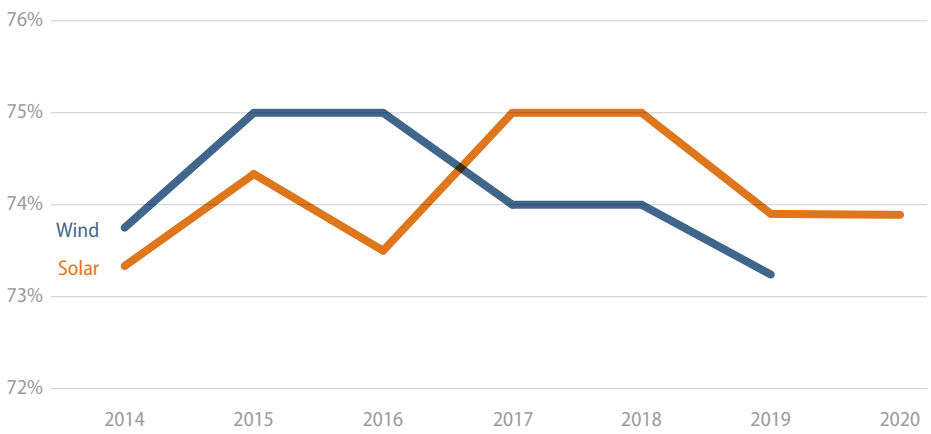
This is critical because solar photovoltaic and wind projects are capital-intensive infrastructure projects, financed by debt-heavy capital structures. Nearly 74 percent of the solar photovoltaic project capital costs were financed with debt in 2019 and the first half of 2020, on a weighted average basis, and 73 percent in the case of wind. (see Figure 4) So even as clean energy projects are able to leverage equity at par with any infrastructure opportunity, the borrowing premium is reflective of the risks perceived by financiers, as described earlier, despite their keen interest in the sector.

While the capital structure of renewable energy projects is competitive with other infrastructure classes and with more developed markets, the sector can realize even more meaningful gains by addressing the real and perceived risks that keep borrowing rates high and certain investor groups out of the market. The U.S.-India Green Transition Finance Initiative, aimed at addressing the financial risks plaguing the quantity and price of debt, could alleviate the limiting factors of India's green transition.

FIGURE 4

Debt ratios of close to 75 percent are the norm in India for solar and wind projects

Weighted average debt ratios for solar and wind projects in India



Source: Arjun Dutt, Lucila Arboleya, and Barath Mahadevan, "Clean Energy Investment Trends 2019: Evolving Risk Perceptions for India's Grid-Connected Renewable Power Projects" (New Delhi: Council on Energy, Environment and Water and Paris: International Energy Agency, 2019), available at https://www.ceew.in/sites/default/files/CEEW-Clean-Energy-Investment-Trends-2019.pdf.

The failing financials for coal power

The 2017 National Electricity Plan forecast net additions in coal-fired generation capacity of close to 45 GW by 2027.[46] The primary aim of this additional capacity was forecast to meet peak demand. However, the economics of peak demand thermal power are becoming less compelling, given the significant drop in renewables costs and the availability of flexible resources such as battery storage, hydropower, and natural gas. In addition to slowing down the pace of new thermal power addition, the market disruption posed by renewable energy puts a large pipeline of in-construction thermal assets under risk of financial viability.

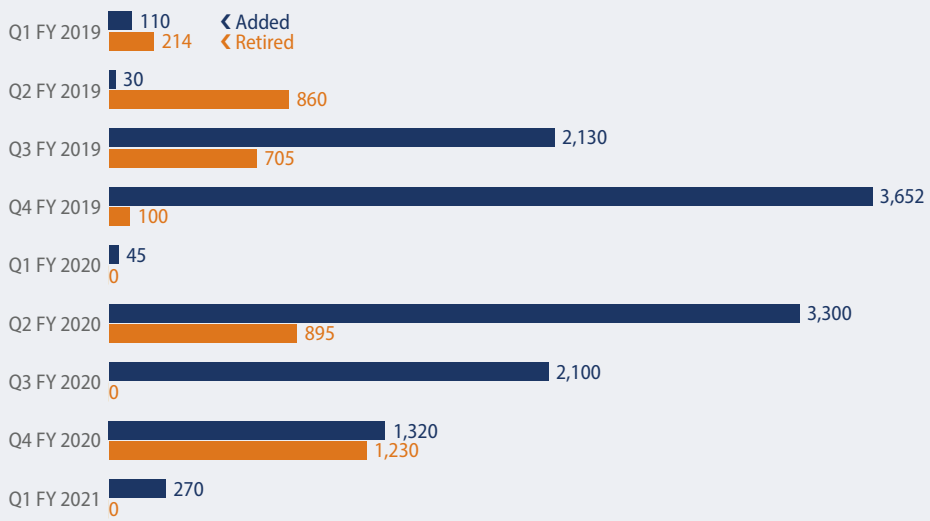
Existing thermal power plants also face operational and financial challenges, with average utilization rates at a record low of 41 percent in April 2020, down from 63 percent in April 2019, and expected to drop to 35 percent to 40 percent by 2022.[47] Inefficient, high-tariff, and high-emission plants are expected to suffer strain given technical requirements to sustain a minimum 55 percent utilization rate at plant level, which could precipitate financial distress for banks and nonbank financial institutions (NBFIs) that hold debt capital in these projects.

This has twin implications for India's clean energy transition. First, the drop in investor interest in thermal power is an opportunity for renewable energy projects, as it offers to investors power sector diversification with lower risks and better returns. On the other hand, thermal power's declining financial viability, including some assets turning nonperforming, will result in liquidity constraints on debt and an overall adverse investment environment for India's power sector assets. This could be particularly challenging as India's green transition necessitates large-scale investment across multiple sectors, including renewable energy production, power sector upgrades, sustainable mobility, and industrial decarbonization.

FIGURE 5

India's coal capacity additions have outweighed retirements in recent years

Coal capacity added versus retired in India by fiscal quarter, in megawatts



Source: Arjun Dutt, Lucila Arboleya, and Barath Mahadevan, "Clean Energy Investment Trends 2019: Evolving Risk Perceptions for India's Grid-Connected Renewable Power Projects" (New Delhi: Council on Energy, Environment and Water and Paris: International Energy Agency, 2019), available at https://www.ceew.in/sites/default/files/CEEW-Clean-Energy-Investment-Trends-2019.pdf.

The challenge: Scaling up new and existing flows to clean power generation

Notwithstanding the tremendous investment shifts toward renewable energy, these flows will have to triple from present levels for India to realize its 2030 deployment ambitions, even in this established and rapidly growing sector.[48] The scaling up of such investment flows will require the mobilization of additional sources of finance, both domestic and foreign as well as public and private.

Existing credit sources from domestic banks and NBFIs alone will be insufficient to bridge the finance gap. The combined exposure of banks and NBFIs to India's power sector stands at around $160 billion,[49] which is equivalent to the lending necessary to finance India's 2030 renewable energy generation ambitions. Domestic financial institutions are not able to extend new credit of this magnitude. Sectoral exposure limits for banks and an impending increase in nonperforming assets in the wake of the economic disruption caused by the COVID-19 pandemic are likely to constrain the ability of both banks and NBFIs to extend adequate amounts of credit to finance India's clean energy transition.[50]

Asset-liability mismatches, government-mandated power sector exposure limits, a high proportion of nonperforming assets, and liquidity constraints for NBFIs will likely constrain finance flows from existing sources.

The corporate bond market, particularly the green bonds subsegment, could play an important role in mobilizing the required resources at scale, through the refinancing of primary debt and augmenting overall capital flows. However, the large-scale mobilization of capital through the bond market requires interventions, such as credit enhancement, to generate asset portfolios attractive to investors as well as to grow the pool of clean energy bond investors itself.

The unlocking of foreign finance flows, particularly from institutional investors, will be the critical factor for India to realize the levels of financing required to meet its sustainable development objectives, not only in the power sector but for all of the country's green transition goals, addressed below. It is the policy measures responsive to foreign finance acceleration that will be the focus of this report's recommendations, including a strategy where the Indian and U.S. governments can work together.

The latent opportunity: India's electric mobility transition

India's automobile sector, which contributes 7 percent to 8 percent of India's GDP,[51] has been facing a severe downturn through most of 2019, further exacerbated in 2020 by the coronavirus pandemic. In the face of this, the market outlook for EVs in the country looks bleak at best. It falls far short of the policy indication set for 2030, which sets targets of new EV stock additions at 70 percent of all new commercial cars, 30 percent of private cars, 40 percent of buses, and 80 percent of two- and three-wheel vehicles. Based on CEEW's analysis, these target numbers would equate to 102 million EVs by 2030, including 94 million two-wheelers and 3 million each for three-wheelers and four-wheelers. By way of context, at the end of March 2020, total registered EVs stood at about 500,000. Of India's total EV fleet, 246,000 were added in the financial year 2019–2020 alone.[52]

TABLE 2

Electric vehicle (EV) production and charging infrastructure costs and investments for India's 2030 ambitions, in Indian rupees and U.S. dollars

EV categories	Total production costs (in Indian rupee hundred crore)	Investment toward charging infrastructure development (in indian rupee hundred crore)
Cars, private	3,379 rupees ($48 billion)	82 rupees ($1.2 billion)
Cars, commercial	1,782 rupees ($26 billion)	108 rupees ($1.5 billion)
Buses	559 rupees ($8 billion)	40 rupees ($0.6 billion)
Three-wheelers	341 rupees ($5 billion)	9 rupees ($0.1 billion)
Two-wheelers	6,337 rupees ($91 billion)	77 rupees ($1.1 billion)
Total	**12,398 rupees ($177 billion)**	**316 rupees ($4.5 billion)**

Source: Vaibhav Pratap Singh, Kanika Chawla, and Saloni Jain, "Financing India's Transition to Electric Vehicles: A USD 206 Billion Market Opportunity (FY21 - FY30)" (New Delhi: Council on Energy, Environment and Water, 2020), available at https://cef.ceew.in/solutions-factory/publications/financing-india-transition-to-electric-vehicles.

That said, the overall size of the EV consumer market in 2030 could be as large as $206 billion cumulatively if the ambition is realized.[53] More immediately, India may see a surge in first-time vehicle owners as India's middle class continues to grow, wealth increases, and consumers seek modes of transportation that allow social distancing. This is an opportunity for EVs to cater to this market with competitively priced products and a suite of financing and ownership solutions. For example, this market offers a huge challenge and opportunity for the auto loan market. If consumers were to seek debt financing for only 50 percent of the EV upfront costs for vehicles purchased from 2021 to 2030,

the banking sector would have to more than triple its current advances of $31 billion toward vehicle loans over the next 10 years. For the economy also, this could be an opportunity to drive significant growth in a new sector, with investment needs of more than $180 billion in vehicle production and charging infrastructure in the coming decade alone.[54] (see Table 2)

Several Indian government ministries and departments, both at the central and state levels, are supporting this transformation of the mobility sector. More than 15 states and union territories have already developed EV policies and regulatory support pathways to accelerate electric mobility adoption, and other states are developing such policies. Nevertheless, a transition to an electric mobility future faces a number of impediments. High upfront costs are the primary barrier to mass EV adoption; Evs can be up to three times more expensive than internal combustion engine vehicles on an outright purchase cost basis. Furthermore, EV adoption at scale is constrained by a lack of clear national-level policy signals and support, consumer concerns around availability of charging mechanisms, and anxiety over the driving range from a single charge.

The challenge: Catalyzing flows to new and underserved segments

Access to financing will be a critical factor for EV adoption, given the mammoth investment requirements across original equipment manufacturers, battery manufacturers, charge point operators, and end consumers. Interventions that make capital available and affordable will play a leading role in determining the pace, efficiency, and cost of the mobility transition. It will be important to nurture collaborations that strike the balance of advancing the mobility transition, without distracting from power sector decarbonization efforts and supporting investment flows.

Certain other clean energy segments, such as distributed renewables,[55] with their small ticket size and distributed nature, have been unable to access capital at scale, making transaction costs prohibitive. Such segments require catalytic financing solutions such as warehousing and credit guarantees, which can lower risks for financiers and crowd in finance flows at scale. These catalytic financing solutions could also provide a financing pathway for more extensive deployment of rooftop solar systems, with India's 40 GW by 2022 target representing a $30 billion to $40 billion investment opportunity—though this is only a subset of overall renewable energy investment requirements.[56] For the distributed renewable energy-powered productive applications segment, such mechanisms could open up investment opportunities at the scale of $39.6 billion for farm-based applications and $13.2 billion for nonfarm applications.[57]

These opportunities are further bolstered by their job-creating potential. India's targets of 100 GW of solar and 60 GW of wind power capacity are likely to generate about 1.3 million direct jobs on a full-time equivalent basis. In 2017, the sector provided direct employment to about 309,000 people, according to primary data collected from 37 distributed renewable energy companies. In addition, the distributed renewable energy sector has created employment opportunities for another 470,000 people, generating jobs in end-user communities thanks to newly acquired or improved electricity access. Small- and large-scale microgrids of 20 GW can employ around 110,000 workers for skilled and unskilled activities, while rooftop solar installations could create about 50,000 skilled and unskilled jobs for every 4 GW deployed.[58]

Recommendations: An ambitious U.S.-India green transition finance agenda

To stand a fighting chance to realize $2.5 trillion in green transition finance by 2030 in India, the U.S. and Indian governments have an important opportunity to collaborate. Both countries should set an aggressive ambition to mobilize high levels of annual international sustainable financing to India as the top shared priority for U.S.-India climate cooperation.

A clear declaration from the prime minister and president will be required in order to: (1) catapult sustainable finance mobilization to the top of India's policy priorities; (2) signal to the private sector the robustness of the investment opportunity available in India's priority sustainability sectors; (3) move resources at the necessary scale and urgency to realize both domestic and international commitments on sustainability; and (4) align and drive the range of domestic and foreign stakeholders to work with perseverance and creativity in the face of the market and policy complexities.

Prime Minister Modi and President Biden should agree early in the new U.S. administration on a high-level strategy along the lines of the recommendations presented below, in order to mobilize international flows. Such a strong public declaration of Indian and U.S. policy and resource commitment will be a critical first signal to private international investors. The declaration should explain where the government of India sees prioritized action; what actions each government will take separately and together; and what actions it expects of stakeholders, including but not limited to officials, regulators, multilateral development institutions, banks, investors, and project developers.

CAP and CEEW recommend that the government of India launch a process to identify prioritized green transition sectors for investment. The U.S. and Indian governments must then focus on a comprehensive strategy to de-risk the investment environment for those prioritized sectors.

Leadership and accountability will be critical elements in driving prompt and concrete results. This report recommends that the leaders set clear and ambitious timelines and performance standards. To ensure accountability, the leaders should task appropriate senior officials to lead on action:

- The minister of state for new and renewable energy or a senior official in the prime minister's office should lead the national process to determine prioritized sectors for investor guidance. The special presidential envoy for climate change could serve as the lead U.S. counterpart in an advisory role, as India deems appropriate.

- The U.S. International Development Finance Corp. chairman and the Indian secretary of the Ministry of Finance Department of Economic Affairs should chair a working group to implement a de-risking strategy drawing from the recommendations below.

Action on identifying prioritized green transition sectors for investment is urgent. Renewables for power generation, as detailed in this report, is one such step, but the government of India should determine investment priorities among alternative end-use green technologies, such as sustainable transport and battery technology. On the other hand, work on de-risking will require more sustained, long-range action and attention. The governments will need to discuss the mechanisms for coordination. There may be temptation to build from preexisting structures such as the U.S.-India Clean Energy Finance Task Force, but the scale of the challenge and action will require higher-level engagement and creativity. (see text box)

Existing U.S.-India bilateral clean energy finance programs

The United States and India built a wide-ranging and deep climate and clean energy partnership under the Obama administration to include a number of clean energy finance initiatives. Although the Trump administration dropped all engagement with India on climate matters and significantly scaled back clean energy cooperation, the governments continue some limited cooperation on clean energy finance matters and even launched a new initiative through the U.S.-India Clean Energy Finance Task Force. Nevertheless, the scope of the U.S.-India clean energy finance agenda is swamped by the scale of India's finance mobilization challenge, which extends beyond clean energy to the full gamut of India's green transition agenda.

U.S.-India Clean Energy Finance Task Force: The task force serves as the organizing mechanism for bilateral clean energy finance-related cooperation.[59] Task force programs have included: (1) PPA bidding guidelines, contracts, and procurement standardization; (2) optimization of payment security mechanisms for delayed payments in utility-scale projects;[60] (3) utility-led, community-based distributed renewable energy business models; and (4) policy, regulatory, and cost-effective strategy development to ensure power system flexibility to integrate renewables, while meeting electricity demand. The last program, launched in 2019 as the Flexible Resources Initiative, aims to enhance investment in renewable energy and flexible resources. The U.S. Department of State's assistant secretary for energy resources and the Indian Ministry of New and Renewable Energy secretary co-chair the task force, while the Ministry of Power secretary leads for India on the Flexible Resources Initiative.

U.S. Agency for International Development (USAID) Partnership to Advance Clean Energy-Deployment (PACE-D): As the U.S. government's centerpiece bilateral clean energy assistance program with India, PACE-D supported clean energy technologies deployment and policies through a $20 million, five-year project. On clean energy finance, PACE-D: (1) supported the launch of green bonds in India,

through capacity-building activities and partnerships with relevant Indian government agencies, and (2) it funded the U.S. Department of Energy and National Renewable Energy Laboratory's work on grid integration of large-scale renewables, under the $30 million, 2015–2020 Greening the Grid/Renewable Integration and Sustainable Energy initiative.[61]

USAID India Regional Energy Program: This USAID program runs from 2020 to 2025 and focuses on a range of energy-related activities to build technical capacity, mobilize private sector investment in clean and reliable energy access, and create an enabling environment to bolster India's energy markets.[62]

As noted earlier, CAP and CEEW recommend that the two governments prioritize identifying sectors for investment as a top and urgent action. The design of a national sustainable finance taxonomy and performance standards would represent an important contribution to this effort. For the government of India's part, defining the scope and prioritization of market sectors that comprise sustainable finance will serve as a policy and implementation framework for officials and regulators from Delhi to states and localities, and it would set operational guidance for overall investment coordination. A clear governmental framework sends a strong signal to private investors, reducing perceived risks and mobilizing investment. This could also help drive needed standardization and comparability of data to boost market integrity and streamline flow of capital from within the country or internationally.[63] Such a strategy and the related regulation could help deepen investment flows in the form of bond subscriptions, possibly issued both in the Indian and U.S. markets either in INR or USD, and create a class of investors looking to invest in green projects in India.

By necessity, the government of India will have to lead a stakeholder process to develop and finalize the sustainable finance framework, including appropriate thresholds and performance standards. Given the urgency of the task, authorities will have to strike a balance on a process that is both inclusive and quickly decisive. Positively, India is several steps ahead in the process given that the SEBI guidelines are already based largely on existing internationally recognized frameworks. For its part, the United States can make important contributions by drawing on U.S. governmental, academic, and corporate experience. Given the importance and urgency of the task, the authors recommend that the minister of state for new and renewable energy or a senior official in the prime minister's office and the U.S. special presidential envoy for climate change, who could serve as principals in a broader bilateral climate change policy process, chair this process and set a date for its conclusion.

Identifying priority areas and committing to collaborate to de-risk those sectors as the first step to mobilize capital toward these areas would be an appropriate and ambitious target for bilateral cooperation for the Indian market. It would also signal to the international community the importance of market-based collaborations between developed and developing countries to accelerate action that is compliant with the Paris Agreement. These efforts can be showcased at the U.N. Climate Change Conference of the Parties in Glasgow, Scotland, in November.

To this end, CAP and CEEW propose developing joint interventions and mechanisms in the global sustainable finance discussion, which could find a place in the U.S.-India Green Transition Finance Initiative. The below initiatives could serve as component elements, with each focused on deepening sustainable finance markets in India and developing functional and mutually beneficial interlinkages between private capital in the United States and green investment opportunities in India.

- **Green tagging:** The two governments, with the potential support of market players and think tanks, should develop data and criteria for green-tagging tools, which can increase visibility of assets and their climate impact for potential investors. Collaboration on this aspect would ensure that U.S. green investors recognize and support Indian green ratings. The two governments could potentially offer tax inducements to create an investor class that invests in Indian green-rated projects.

- **Strategic de-risking:** As discussed in detail in this report, India's sustainable development sectors face several risks that act as impediments to investment and therefore to more rapid deployment. Several of these obstacles require systemic technology or regulatory corrections, which have long gestation periods. To circumvent these risks in the short to medium run, targeted de-risking offers an innovative way to use small amounts of public or philanthropic capital to smooth the pace of transition. De-risking mechanisms have a simple logic; they identify the risk and add a safety buffer that makes investments in the de-risked investment class have a high enough credit rating to satisfy potential investors. These mechanisms are insurance of sorts and thus have a market-reflective price. The authors propose that public or philanthropic money be used to cover this cost so that private capital, including institutional capital, can come into sectors that are otherwise outside these investors' risk appetite. De-risking instruments can take many forms; some proposed options are below.

- **Publicly funded credit enhancement interventions:** The United States and India should work together to expand credit enhancement mechanisms, such as first-loss reserves, loan loss pools, credit guarantees, and other risk-sharing mechanisms, to crowd in private investment. These mechanisms can help create an investment track record and reduce the perceived risks over time, thus enabling the discovery of true credit risk.[64]
  - The United States should direct the U.S. International Development Finance Corp. to put India and sustainable finance as its top country and sector targets in its blended finance strategy. For example, the corporation's board could set a policy to dedicate a proportion of its overall credit guarantee authority exclusively to crowd in U.S.-based private investments to India's identified green transition sector opportunities. The International Development Finance Corp. should partner with other development finance institutions and philanthropic groups on co-financing, including leveraging domestic public money furnished by India under this collaboration.[65]
  - The United States and India should leverage their influence through their voice in the boardrooms of the multilateral development banks, which have extensive catalytic finance tools and deep resources.
  - The government of India should leverage domestic credit enhancement structures, such as the India Infrastructure Finance Co. Ltd. and IREDA, to provide de-risked and diversified pipelines of projects under this collaboration.[66]

- **Philanthropic and privately funded catalytic financing interventions:** The United States and India should also engage climate-oriented philanthropists, impact investors, and other high net worth individuals who share a common climate goal. Many organizations and people with this type of more concessional capital are heavily focused on India and should be brought into the discussion of how their capital can help de-risk investments into India. There was some progress in this area during the Obama administration, and some work on these types of partnerships has continued over the last four years.

- **Payment security mechanism 2.0:** The governments could develop a more transparent and bespoke payment security mechanism framework.[67] This can demonstrate adequate risk coverage to investors and project developers on specific risks requiring systemic technical solutions, but it can be hedged over the short to medium run through such instruments. As a result, once the systemic solution is in place, investor confidence would automatically stay at the credit-enhanced level, even without the hedge.[68] For example, a grid integration guarantee is an instrument that could indemnify renewable energy generators against revenue loss due to generation curtailment. Power systems operations data can be used to

calculate curtailment risk premiums, factored into market reflective pricing. Such an instrument could lower off-taker risks, crowd capital into new renewable energy projects, and clearly signal to in-country agencies the need for systemic correction on grid integration of variable renewables.[69]

- **U.S.-India foreign exchange hedging facility:** The government of India could create an at-cost currency hedging solution for project developers that are borrowing USD-denominated capital mobilized under the U.S.-India Green Transition Finance Initiative.[70] This preferential signal could give a significant impetus to USD-denominated foreign direct investment into sustainable sectors in India, and it would ensure that domestic players hedge adequately to avoid commercial viability concerns in case of a period of volatile currency fluctuation. The government, through the Ministry of Finance and the Export-Import Bank of India, can do this through long-term swaps at a highly competitive price.

- **Roadshows and matchmaking:** Innovation is at the heart of the clean energy transition, but financing innovation and joint development of new technologies continues to be difficult to facilitate at scale. The governments could identify accelerator programs for market scaling of proven technology developed in either the United States, India, or jointly, which could then be showcased to venture capital and early-stage investors through a marketplace facilitated by the U.S. and Indian governments. This would create a conducive environment for scaling research and development efforts and matchmaking them with interested investors.
  - India and the United States already have the jointly funded PACEsetter Fund, aimed at accelerating the commercialization of innovative off-grid clean energy access solutions for households that use less than eight hours of electricity per day. The PACEsetter Fund targets early-stage grant funding to businesses addressing this underserved market to develop and test innovative products, business models, and systems. The governments should broaden the scope of this fund to encompass market-scalable clean energy applications for productive use or battery storage, for example, in line with India's identified green target sectors. The fund could be used as a pre-seed accelerator, making early-stage businesses ready for the proposed matchmaking marketplace for participating early-stage U.S. investors. The emphasis should shift toward scaling applications in productive uses of distributed clean energy, where there is a $53 billion opportunity in India.[71]

- **Greening finance flows through enhanced financial regulation:** New multilateral bodies, such as the Network for Greening the Financial System, have been established to help countries coordinate efforts to integrate climate risk into their regulatory frameworks and otherwise green their financial sectors. Long-standing standard-setting bodies, such as the Basel Committee on Banking Supervision, have also begun to explore how climate change and associated risks could be integrated into their workstreams. The two governments could coordinate their engagement at these multilateral bodies to increase their collective influence and provide significant benefits, including capacity building, standard setting, and international credibility.

- **Green banks and windows:** The government of India should assess potential platforms to develop or deploy catalytic finance instruments within or alongside key existing public sector financial institutions, a mechanism conceived by CEEW. Such green window mechanisms would help expand clean energy markets within the purview of the specific financial institutions—for example, IREDA or NABARD.[72] IREDA has signaled its interest in operationalizing a green window facility, to be capitalized by an initial $20 million and to be augmented by another $80 million from other agencies.[73] The green window is geared toward catalytic financial interventions to crowd in private sector capital for underserved clean energy market segments.

- **Green securitization:** This is an area of growing demand, as companies use asset-backed securities to free up capital for new projects. U.S.-India cooperation could drive international institutional investment into operational low-risk projects through this route. For example, cash flows arising from solar and small-scale wind assets, loans for energy-efficiency upgrades, and waste to energy contract receivables are operational low-risk projects that can be securitized.[74] The Indian and U.S. governments could use small quantities of public money to develop pipelines of securitized green projects and/or a small guarantor facility to underwrite the risks of such securities.

Conclusion

Despite rapid strides, a number of financial, market, and policy factors have constrained the pace and quantum of India's green transition. The economic hit from the COVID-19 pandemic has further set back progress. Even with the Indian economy poised to rebound in 2021,[75] it is clear that Indian public and private financial resources by themselves are not sufficient to close the enormous investment gap required to meet the country's green transition objectives.

The policy imperatives have, perhaps, never been clearer: It is in India and the world's interest for India to move to an increasingly progressive decarbonization pathway. Realizing the targeted progress on India's green transition would also advance other important policy co-benefits such as economic growth through job creation, improved public health outcomes, reduced air pollution, and long-term positive returns on investment. The United States and India have a shared interest in confronting these challenges.

The change in Washington to a Biden presidency will bring certain new directions to the relationship—most notably, a U.S. commitment to resume and elevate bilateral climate cooperation across policy, commercial, scientific, and research and development areas. Cooperation on mobilization of foreign institutional finance should be a central component of the U.S.-India climate cooperation agenda. A reinvigorated program of climate cooperation can serve to demonstrate to the respective countries and the world a shared commitment to jointly transition to a lower-carbon development pathway. And the U.S.-India Green Transition Finance Initiative could contribute critically to India's green transition, a consequential element in the global strategy to combat climate change.

About the authors

Kanika Chawla is a nonresident fellow at the Council on Energy, Environment and Water.

Alan Yu is a senior fellow and the director of International Climate Policy at the Center for American Progress.

Rita Cliffton is a policy analyst for Climate and Energy Policy at the Center.

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