13th India-U.S. Track II Dialogue on Climate Change and Energy
March 20-22, 2024 | New Delhi, India

Executive Summary

The Aspen Institute for Energy and Environment and Ananta Aspen Centre, with input from the Center for American Progress and the World Resources Institute, convened the 13th India-U.S. Track II Dialogue in New Delhi, India, March 20th-22nd. Topics of discussion included green hydrogen, heat resilience and cooling, international climate finance, and green trade. Dialogue participants also engaged in conversations about the state of play of politics and climate change in both countries – including India's G20 presidency, the power of the U.S. Inflation Reduction Act (IRA), and multilateral UNFCCC COP28 commitments – and held a session on China's role in global clean technology development and deployment.

The growing Indian and U.S. economies present many opportunities for collaboration on climate action. However, both countries continue to use and build out fossil fuel infrastructure, presenting a significant challenge to the UNFCCC COP28 UAE Consensus commitment to transition away from fossil fuels. Multilateral spaces are important to protect and drive climate action, and dialogue participants recommended a series of short-term actions that India and the U.S. can undertake to support bilateral climate progress.

Green hydrogen:

- **Share both positive and negative lessons learned from the U.S. hydrogen hubs in Track I dialogues and through subnational exchanges.** As India is investing INR 400 crore (~ $48 million) in green hydrogen hub development by 2026 and will need to conduct local community engagement across Tamil Nadu, the U.S. can share lessons learned from the planning and rollout of its hydrogen hubs to inform ongoing national and subnational Indian hydrogen hub development.
- **Leverage the Quadrilateral Security Dialogue (Quad) to set rules for hydrogen markets.** This would include joint research and development to lower production costs and to harmonize standards on green hydrogen definitions, safety, and certification methods to promote transparency and enable fair trading markets, developing a global hydrogen market and trade rules, and creating a price index for hydrogen to help develop the interoperability of market indices.

Heat resilience and cooling:

- **Elevate heat resilience and cooling solutions to Track I dialogues.** As cooling demand rises, government-to-government level engagement could lead to technical collaboration and joint research and development projects can be developed on energy-efficient and affordable cooling appliances, heat pumps, thermal storage, and solutions for alternative coolants. In addition, the two countries can share lessons on innovative adaptation projects, parametric insurance, and model heat plans for cities.

International climate finance:

- **A Track 1.5 Investments Roundtable is needed to discuss the financial and regulatory reforms needed for a clean energy transition in India.** This dialogue would bring together the private sector, investment community leaders, and finance ministry officials to discuss concrete reforms needed to address real and perceived risks of investing in India, with the goal of mitigating these barriers. This platform will also include discussions on concessional capital for small and medium-sized enterprises and decentralized energy sources such as rooftop solar.

Green trade:

- **Deepen cooperation around critical minerals, enhance technical dialogues, and consider reduced tariffs for green goods and services**. Both India and the U.S. are looking to build trade relations to catalyze investments in green infrastructure and industry, build resilient and secure supply chains related to renewable energy and electric vehicles. To that end, green trade should be a strategic priority, and could involve creating a critical minerals partnership within the Quad; enhancing cooperation around carbon accounting, sustainability standards, and best practices in green procurement; and initiating a process to identify goods and services essential to both countries' green transition subject to favorable tariff treatment.

Full Summary of Outcomes

The 2024 India - U.S. Track II Dialogue on Climate Change and Energy came at a moment where upcoming elections in both countries, coupled with a rapidly narrowing window to avert the worst impacts of the climate crisis, underscored the importance of the Track II process for providing a platform for national and subnational cooperation.

At the 13th meeting of the Dialogue, the delegations discussed the countries' international commitments, from India's leadership in the G20, which included a shift from "coal" phase down to "fossil fuel" phase down and commissioned a report calling for $4 trillion to finance the global green transition, to the UNFCCC COP28 UAE Consensus document, where for the first time parties agreed to transition away from fossil fuels. Both India and the U.S. are experiencing robust economic growth, which allows opportunities for climate collaboration in many technological as well as financial areas to achieve these high-level commitments, and overcome growing energy needs that threaten to undermine efforts to replace fossil fuel demand with clean energy.

The U.S. under President Biden is making progress on climate action, with unprecedented funding allocated to clean energy and a Nationally Determined Contribution (NDC) target under the Paris Agreement of 50% reductions by 2030. The IRA opened the door to significant public and private sector investment in climate mitigation and adaptation, resulting in unprecedented growth in clean energy across

the U.S. and a commensurate reduction in the demand for domestic coal and oil. However, the U.S. became the world's largest producer and natural gas exporter in 2023 despite the need for the world to transition from fossil fuels. It is clear more work must be done to reach the goals of the Paris Agreement, and that these multilateral spaces such as this Track II Dialogue are critical to support bilateral relationships between two of the world's largest greenhouse gas emitters.

Hydrogen

Among the Dialogue discussants present, hydrogen was described as a niche solution for emissions reductions in hard-to-decarbonize industries. There was also significant concern about the narrative around hydrogen as a larger "solution" to energy needs, as well as concern about the potential for hydrogen to extend the lifetime of the gas industry. Discussants noted that despite the narrative around hydrogen as a broader "solution" to energy needs, its uses should be restricted to incentivize correct usage and effectively divert the hydrogen that will be produced to the best end use scenarios. With these guardrails in mind, the following opportunities exist for collaboration between India and the U.S.:

- **Collaboration on end use policies and standards**: There are opportunities to channel the attention given to hydrogen and direct it towards truly high-value end use sectors, such as steel decarbonization and petrochemical production. Both industries must be decarbonized, and hydrogen could have a valuable role in these processes. Given that these sectors do not always represent a large share of GDP in both countries nor have wide profit margins, a market pull may not suffice for a transition to hydrogen, and government actions in the form of regulations that incentivise the use of hydrogen in these sectors may be needed.
- **Harmonization of standards**: India and the U.S. are well poised to demonstrate practical leadership around developing global hydrogen markets and trade. The two countries have set their own carbon intensity numbers and lifecycle boundaries for what qualifies as "clean" or "green" hydrogen. With both countries serving as potential exporters, they should align on calculation, reporting, and certification methods to promote transparency and enable global trade markets.
    a. Creating a price index for hydrogen would be helpful as well in calculating and developing the interoperability of market indices; India is already looking in this direction with the Indian Gas Exchange, a trading platform in Gujarat.
- **Exchange lessons learned:** Administering the rollout of the U.S. Hydrogen Hubs program and the Clean Hydrogen Production Tax Credit has equipped the U.S. to share both positive and negative learnings that can benefit India as it implements its own hydrogen hubs program. These lessons include:
    a. Efforts to navigate local community engagement and political dynamics.
    b. The challenges of offering a primarily supply-driven set of tax credits and grants. The Dialogue discussion centered around the advisability of the U.S. Clean Hydrogen Production Tax Credit to encourage increased hydrogen production. The delegation cautioned that India should closely review the efficacy of the design and implementation process of this tax credit as it formulates its own incentive structures.
    c. The need for uptake policies to drive demand in the right applications. Dialogue participants discussed the need in the U.S. for uptake policies, supply strategies, and other tools, as well as efforts to better evaluate and situate hubs, and to avoid incentivizing the

production of more hydrogen unless offtake is clear. Dialogue participants noted that the siting of hubs in the U.S. has often been driven by politics, potentially complicating their long-term success.

- **Collaboration on research and development:** Large quantities of hydrogen should be avoided in riskier end uses, like home heating, which creates air quality and safety concerns. Both countries are researching uses where blending might be appropriate, and could benefit from joint research on pipeline safety.
    a. Areas for further research and development also include electrolyzers, critical minerals for those electrolyzers, hydrogen safety, leakage risks, and storage.

Heat Resilience and Cooling

Heat waves have significantly affected livelihoods and total economic output in the U.S. and India, and will continue to do so. With hotter temperatures for longer stretches of the year, the demand for new air conditioners and longer running times of those appliances is an important consideration for both governments. By 2035, an expected 50% of Indian households will have air conditioning, leading to a 9-fold increase in electricity demand (compared to 10% currently), and seventy-five per cent of the world's increased cooling demand by 2030 is expected to come from the U.S., China, Southeast Asia, and India. Access to cooling remains inequitable in India and globally, but as it becomes more available and ideally as a result improves health and productivity outcomes, transforming the cooling sector becomes even more important and could yield 100gt of CO_2 savings if done efficiently. For these reasons, this conversation on heat resilience and cooling is especially important for India and the U.S. to carry forward.

The delegations recommended **developing a cooling pillar to elevate cooling in Track I conversations**, specifically in the ongoing collaboration between the U.S. Department of Energy's office and India's Bureau of Energy Efficiency. This Track I conversation should include a set of discrete issues the two countries may consider and potential joint actions the they can take in alternative cooling solutions, policy changes, and information sharing, including:

- **Collaborating on alternative solutions for cooling strategies:** Beyond AC units, there are other opportunities to build heat resilience in both countries, by looking at alternative technologies as well as addressing resilience inequities:
    a. Ceiling fans can be made more efficient, and the market for super-efficient ceiling fans could go from 1.6 to 20 billion, resulting in huge emissions reductions and representing a massive market opportunity that also solves access issues. Unlike ACs, numerous Small and Midsize Enterprises (SMEs) are manufacturing these fans, and government efficiency requirements in this sector, while positive, should include government support for SMEs to help these smaller companies adapt.
    b. As an avenue to address cooling inequities, there is significant potential in the India-U.S. collaboration on the Green Building Council. One area of work in this area could be in the design of affordable housing and community cooling centers, which are key to addressing heat vulnerable communities in both countries.
    c. Work together on a model heat plan for cities that individual cities can then utilize to create their own bespoke plans. Keeping cities cool and reducing urban heat island effects will also be key to help 'right-size' the requirement/demand for ACs. Alongside these efforts, the medical profession in the U.S. has no accepted category for recognizing and

recording heat-caused impairment and death which typically are categorized as strokes, dehydration and heart attacks - a tenant of which can be better defined in these localized plans.

- **Potential regulatory changes and incentives:** The two countries can lead a global discussion that includes the development of a regulatory structure on pollutant phaseout, as outlined in the Montreal Protocol and Kigali Amendment, and collaborate on the adoption of heat plans at national and local levels.
    a. India might consider joining the U.S. in signing the Global Cooling Pledge, launched by the UAE at COP28, to reduce cooling-related emissions through national actions and international cooperation.
    b. Both countries should continue to support Kigali's implementation plan. India is ahead of the U.S. in terms of the type of refrigerants used in air conditioners, but the U.S. is moving to lesser Global Warming Potential (GWP) gasses, and there are potential opportunities for cooperation on ultra low GWP refrigerants.
    c. Shared work can be done on workers' rights issues, as both countries navigate policies and advocacy for vulnerable workers. For example, collaborating on market tools, and parametric insurance schemes that might address some of these inequities and challenges - i.e. once the temperature hits a certain heat threshold, a day's wages are deposited in your bank account; small infusions of cash to pay electricity bills; and exploring bond tools used in Australia to protect against pollution through tourism payments as a replicable model.
    d. Cross-government bureaucrat training to increase understanding of extreme heat issues in Indian bureaucracy, where understanding is currently low.
- **Quality of information:** Potential information sharing encompassed within a potential clean cooling collaborative, could help both countries amplify solutions, including reducing the need for mechanical cooling. This includes information sharing on optimizing standards, and maximizing information sharing platforms:
    a. Sharing lessons around successful, innovative adaptation projects such as 'cool rooms' and Chicago green alleys, and sharing research on heat impacts, energy efficient and affordable air conditioners. There is cool storage potential in India with mobile cooling stations, and the U.S. can help to identify where these stations should be placed.
    b. Deeper conversation on cold storage units, cold chains, and pack houses would also be useful for India, as the U.S. has more developed technologies in this area.
    c. Traditional knowledge in India, i.e. white tile marble, has kept communities cool for generations and should be considered and implemented contextually. This and other passive cooling techniques (cool roofs, cool surfaces, shading, thermally efficient building materials) have long been used in India and the U.S. can learn from those techniques.

Financing and Trade

There was a sense that historically both countries have lacked clear priorities in clarifying their finance and trade policies to one another. The delegations identified several new constructive channels to help achieve clean energy finance flows:

- **Focusing finance efforts on emerging clean technologies:** These are places where scarce concessional financing can make an impact. This could include green hydrogen for green steel, lithium technologies and production of clean fuels. U.S. companies could bring some of this

information and the production over to India for collaboration. India's potential as a producer of clean hydrogen for clean steel was also flagged.

- **Co-development of a bilateral supply chain initiative:** Both U.S. and Indian companies are desperate to secure sources of clean energy technology and critical minerals. There are mutual concerns about China's potential export controls; countering this concern will require mutual regulatory certainty.
- **Explore financing options unique to India:** Concessional financing and the Just Energy Transition Partnership model used in other Southeast Asian countries likely would not work in India because of the sheer scale of investment India needs. Instead, other ideas to increase financial flows into India were suggested, including reducing information barriers for the private sector, as there remains confusion on both sides. For example, businesses in the U.S. may not recognize the scale of opportunity in India. Other ideas included shifting focus to hard assets; focusing on returns; and finally, focusing on investors rather than negotiators. Additionally, it was flagged that limited concessional capital should be targeted toward developing emerging technologies, which can be used to crowd in investments from other multilateral funds to contribute to a larger capital pool.
- **Co-develop insurance coverage plans for non-linear risk.**
- **Increase alignment and collaboration on trade:** If in the short term the two countries can maintain a spirit of positivity and collaboration in the trade area, there is an opportunity for the two countries to:
    a. Elevate green trade, which would support the transition to a clean energy economy and open the way to cooperation, harmonize customs nomenclature, strengthen the circular economy, lead to shared approaches around carbon accounting, and share best practices around green procurement and supply chains.
    b. Develop a climate peace clause, which would ensure both sides take a softer policy approach on trade issues, which have climate benefits.
    c. Provide support for a Carbon Border Adjustment Mechanism (CBAM), some versions of which might enforce an international trade norm which could minimize trade disputes; provide investment certainty; drive uptake of hydrogen in green steel production; strengthen international equity; improve data collection; and create a more integrated, harmonized climate club approach to CBAMs.
- The following stakeholder groups were identified as communities to engage to advance many of these goals:
    a. A group to look at financial reform and what reform may be required in much more concrete terms;
    b. A group to look at national reform and constraints to sectors in the current investing environment, and private market structure that might expand into a more national orientation;
    c. A group to look at U.S. investment, commercial interests, long-term investment with a return to both sides, and current foreign direct investment;
    d. A group to look at foreign policy and security establishment to begin conversations about the next 5-year horizon, moving away from conversations that have been so elevated that they don't lead to outcomes;
    e. Private sector meetings that look at the export of goods and technologies, the potential for U.S. companies exporting to India or setting up shop in India, improving the resiliency of supply chains in an effort to move away from China.

The following additional opportunities for joint work were also identified:

- The U.S. can learn from India how to mitigate the bottlenecks it is experiencing in solar and wind deployment, drawing on India's leadership in developing renewable energy.
- Expand on information sharing around new technologies, transmission, permitting reforms (i.e. potential opportunities in the U.S. to reconduct existing rights of way with advanced cables to help address transmission bottlenecks and share these lessons learned), and align on climate disclosure rules.
- Agricultural waste-generated biofuels from India could be supplied to the U.S. for alternate aviation fuels. There is a sustainable aviation tax credit in the IRA in the U.S. and India has clearly articulated its interest in converting bio waste into energy. The biofuel conversation in the U.S. is focused on agricultural crops and turning corn into fuel, and this might also serve to shift this conversation.

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