

COLUMBIA GLOBAL ENERGY DIALOGUE

INDIA'S ENERGY SECTOR DEVELOPMENTS AND PRIORITIES: ROUNDTABLE SUMMARY

BY PRANATI CHESTHA KOHLI, DAKSHESH PRANAV THACKER, AMIT KHATRI,
AND DR. KAUSHIK DEB | NOVEMBER 2022

On September 22, 2022, the Center on Global Energy Policy (CGEP) at Columbia University held a private roundtable to discuss the state of energy in India. The authors compiled the following summary of key issues raised during the event.

The event brought global experts together with practitioners from India, helping inform the global community of energy sector developments and priorities in India. The key focus of the roundtable was to review the state of energy in India, as presented by researchers at CGEP, and the immediate need for balancing energy security and energy transition priorities in the country. In addition to the presentation on energy, climate, and environmental policies in India—situating the country's energy transition—participants discussed what they think India's transition should look like, while noting India's relevance in the global order.

This event summary reflects the author's understanding of key points made in the course of the discussion. It does not necessarily represent the views of the Center on Global Energy Policy. The summary may be subject to further revision.

Contributions to SIPA for the benefit of CGEP are general use gifts, which gives the Center discretion in how it allocates these funds. More information is available at <https://energypolicy.columbia.edu/about/partners>. Rare cases of sponsored projects are clearly indicated.



www.energypolicy.columbia.edu

   @ColumbiaUEnergy

Roundtable participants included senior policy makers, corporate executives, civil society representatives, analysts, and experts from academia and think tanks. The event was held as part of a CGEP research emphasis on India's energy transition, with such dialogues among informed and interested parties expected to recur semiannually.

One speaker noted how the energy dialogue synced well with the then ongoing 77th UN General Assembly, given the theme and agenda of that meeting was driven by a number of interlinked global crises including COVID-19, the war in Ukraine, climate change, and macroeconomic headwinds, all of which will have an impact on India's energy transition.¹ This roundtable is also timely given the broad and expansive partnership between India and the United States through the US-India Climate and Clean Energy Agenda 2030 Partnership. Launched by President Biden and Prime Minister Modi in 2021, this program aims to advance shared climate and clean energy goals and includes two tracks: the Strategic Clean Energy Partnership and the Climate Action and Finance Mobilization Dialogue.²

State of Energy in India

The CGEP researchers' presentation noted that as India's population and GDP have grown over the past two decades, so have its energy consumption and emissions. In this context, they documented the significant policy choices India has made in its transition toward a more inclusive and sustainable energy system over the last few years. The presentation reported on progress in eliminating energy poverty and universalizing access to energy, efforts to decouple economic development from growth in energy demand, India's aspiration to achieve energy independence by 2047, and commitments to enhance emissions reductions made at the United Nations Climate Change Conference (Conference of the Parties, or COP26) in Glasgow in 2021.

A speaker noted that India seeks to achieve these reductions through programs such as bio-conservation,³ a National Hydrogen Mission,⁴ and production-linked incentives schemes for solar panels.⁵ Moreover, the speaker said that the Indian government has engaged with other countries such as Germany for clean energy programs,⁶ especially through the International Solar Alliance,⁷ and is working with Sweden and the World Economic Forum on a Leadership Group for Industry Transition that aims to "gathers countries and companies that are committed to action to achieve the Paris Agreement."⁸

Three themes emerged in the participant discussion: energy access, energy independence, and climate policy and commitments.

Energy Access

Energy access in the form of universal access to electricity as well as increasing access to modern cooking fuels in the form of liquified petroleum gas (LPG, a mix of butane and propane) was a core theme. One participant described the universalization of electricity access through the 2017 launch of a *Saubhagya* scheme to provide electricity connections for still "unconnected" households in rural and urban areas, with an outlay of \$2.2 billion over five years. About 28.2 million such households have been provided electricity connections, reportedly achieving connectivity for all households in the country.⁹ The *Ujjwala* scheme

launched in May 2016 provided LPG to rural households that were otherwise using traditional cooking fuels such as firewood, coal, cow-dung cakes, etc. Against a target of 50 million new LPG connections, 95 million new connections have been achieved to date.¹⁰

As India's per capita electricity consumption grows, especially with new households being connected to the grid, electricity generation will need to ramp up. Here, the role of associated factors such as transmission and distribution capacity, grid stability, investments required, and land acquisition were discussed. According to some participants, distribution sector challenges have been an obstacle to growth of the electricity sector, but recent plans to increase competition and financial sustainability of distribution agencies, such as through the proposed Electricity Act 2003 amendments,¹¹ would help. Participants noted the role of Solar Energy Corporation of India as a good intermediary between renewable electricity generation companies and distribution companies, saying its support has lowered the risks of nonpayment to generation companies, resulting in lower equity costs and hence in lower tariffs.

Energy Independence

The CGEP researchers' presentation reported that India has set itself a target of energy independence by 2047. Elements of this announcement include increasing the share of gas in the energy mix, reducing diesel consumption by railways with greater electrification, and a National Hydrogen Mission with a target to produce 5 million metric tons of green hydrogen by 2030.¹² India has also introduced a number of initiatives to increase the domestic production of coal,¹³ and oil and gas¹⁴ to reduce its import dependence.

A participant noted four major energy transitions for India till 2047, when the country wishes to achieve energy independence. The first one is happening with electrification and increased access to clean cooking fuel. The second transition is rapid urbanization and the resultant faster increase in energy demand. The third is a greater role for global markets in domestic energy due to greater integration. The final transition mentioned by the participant is the shrinking carbon budget and hence the need to decarbonize the energy system faster. The same panelist noted three maxims of energy transitions: 1. attaining energy security and independence by having a diversity of sources of energy, 2. developing an energy leapfrog, that is, shifting from traditional energy sources such as wood and charcoal directly to renewables without building a large fossil fuel infrastructure in between, and 3. differentiating between indigenization and resilience of supply chains to allow for optimal sourcing.

After the Russian invasion of Ukraine, many feel a heightened need to find alternative energy sources and diversify suppliers. A speaker noted that an uptick in energy concerns also reflects the risks in meeting rising energy needs in line with rising prosperity. A participant asked what constitutes a risk-adjusted energy transition for India? Another noted that the energy consumption of Indian citizens is much smaller than it is for those in Europe, and hence a supply shock could have more significant developmental impact in India.

Critical minerals were discussed, especially in terms of the impact of China's current dominance of them on energy independence and security. Participants saw a need for diversification of the supply chain for critical minerals.

Attendees then turned to the viability of Indian efforts to establish a solar modules industry:

while the technology is mostly open source and readily available, the longer gestation period for establishment of the Indian semiconductor and solar panel industry compared to China makes competition difficult. Participants hope a strong private-sector presence in renewable energy will extend to the emerging circular economy utilization of e-waste as a source for rare and critical elements.

While national and state electric vehicle (EV) policies are still evolving, a participant questioned whether the current energy mix used to charge them is truly green. A speaker focusing on EV as a measure to reduce dependence on imported liquid fuels suggested the government could mandate that renewable energy companies start giving electricity to charging companies. The speaker noted that access to a robust fast and ultrafast charging infrastructure network within and outside city limits and along highways would likely boost adoption of EVs. In addition, the speaker said that providing lower interest rates to fleet operators purchasing electric vehicles would be important for increasing EV adoption. Fleet operators and e-commerce companies are already setting internal targets for higher EV purchases; a financial incentive that lowers the cost of EVs would be helpful in realizing these targets. An India-specific example would be to bring EVs under the Reserve Bank of India priority sector lending ambit, which could increase investor confidence and banks' willingness to lend. A participant said federal and state departments in emerging markets, especially India, need to extend fiscal benefits to consumers purchasing commercial electric four wheelers in order to increase the rate of adoption.

Finally, participants said there is much scope for the growth of nuclear energy to provide base-load power certainty as a substitute for fossil fuels in the absence of credible storage capabilities for other forms of renewable power. India would need to continue to engage with the international community to find solutions to its exclusion from the global nuclear electricity market, while also finding opportunities to reassure international nuclear equipment and material suppliers of the viability and stability of the Indian market.

Climate Policy and Commitments

Attendees discussed India's progress on its Paris commitments and its reiteration of climate goals in last year's COP26 in Glasgow, including a 500 gigawatt (GW) renewable target and a 1 billion ton greenhouse gas reduction. There was a lot of excitement among participants about the growth in renewable energy in India, but a reminder that the fossil fuel contribution in energy production has not decreased dampened the enthusiasm. Attendees mentioned the broad climate discourse and participation at macro as well as micro levels in India, such as establishing a campaign to save topsoil, arresting erosion in the Majuli riverine island forest, hosting the International Solar Alliance, and launching the Coalition for Disaster Resilient Infrastructure.

Participants also discussed financing the energy transition. The consensus was that there is a need for developing innovative financing and investment tools in the full energy ecosystem, including investment in relatively developed technologies and new technologies as well. While there are a range of new investing options like green bonds, attendees weren't sure whether these were comparable to or cheaper than traditional financing options. Participants said

multilateral development banks need to make a greater effort to mitigate risks and reduce the effective risk premium and interest rates of clean energy investments in the country.

Another participant questioned whether land use continues to be a constraint. An attendee responded that procuring land for solar energy projects remains relatively easy: four to five acres of land are sufficient for a 1 megawatt solar energy project, and land in the western state of Rajasthan would be enough to meet the country's 500 GW target. However, a participant noted that land acquisition remains difficult for wind energy because of resistance from agrarian societies, inadequate compensation measures, and lack of official ownership records. But if there are multiple wind connections, the cost of storage is reduced, changing costs overall.

Additionally, challenges with transmission infrastructure continue; participants said the government cannot build it fast enough to keep up with electricity demand and the proposed growth in generation capacity.

Conclusion

Roundtable attendees said India has made significant policy choices in its transition toward a more inclusive and sustainable energy system over the last few years but that substantial progress in energy access and efficiency is still lacking. Participants highlighted two major objectives of India that they say require more policy support, private financing, and corporate action: achieving a just and efficient energy transition to a decarbonized economy and securing energy independence. Other issues participants said would need to be monitored over the next few years include: the significant share of fossil fuels in energy, the need for energy alternatives, diversification of sources in view of the war in Ukraine, the transition not being predictable and linear, risks associated with the transition, and the importance of policy support.

Notes

1. United Nations, "Overview," 2022, <https://www.un.org/sustainabledevelopment/unga-high-level-week-2022/>.
2. US Department of Energy, "U.S.-India Joint Statement on Launching the U.S.-India Climate and Clean Energy Agenda 2030 Partnership," April 22, 2021, <https://www.state.gov/u-s-india-joint-statement-on-launching-the-u-s-india-climate-and-clean-energy-agenda-2030-partnership/>.
3. Government of India, Ministry of Environment, Forest, and Climate Change, "Year End Review: Ministry of Environment, Forest, and Climate Change," Dec. 29, 2021, <https://pib.gov.in/PressReleasePage.aspx?PRID=1786057>.
4. Government of India, Ministry of Power, "Green Hydrogen Policy," Feb. 17, 2022, https://powermin.gov.in/sites/default/files/Green_Hydrogen_Policy.pdf.
5. Government of India, Ministry of New and Renewable Energy, "Production Linked Incentive Scheme (Tranche II) under 'National Programme on High Efficiency Solar PV Modules,'"

Sept. 30, 2022, https://mnre.gov.in/img/documents/uploads/file_f-1664601098820.pdf.

6. Government of India, Ministry of External Affairs, "List of agreements signed on the occasion of 6th India-Germany Inter-Governmental Consultations," 2022, <https://www.mea.gov.in/bilateral-documents.htm?dtl/35253>.
7. The launch of the International Solar Alliance was announced by H.E. Mr. Narendra Modi, the Honorable Prime Minister of India, and H.E. Mr. Francois Hollande, former Honorable President of France, on November 30, 2015, at the 21st session of United Nations Climate Change Conference of the Parties in Paris, France. See more about the alliance at <https://isolaralliance.org/>.
8. Leadership Group for Industry Transition, "Partnership of leaders. Public-private collaboration. Knowledge for action providers," 2022, <https://www.industrytransition.org/who-we-are/#:~:text=The%20Leadership%20Group%20for%20Industry,to%20achieve%20the%20Paris%20Agreement>.
9. Government of India, Ministry of Power, REC Limited, Saubhagya, 2022, <https://recindia.nic.in/saubhagya#:~:text=Ministry%20of%20Power%20and%20Active,under%20SAUBHAGYA%20have%20been%20electrified>.
10. Government of India, Ministry of Petroleum and Natural Gas, "Pradhan Mantri Ujjwala Yojana (PMUY): Home," 2022, <https://www.pmu.gov.in/index.aspx>.
11. Parliament of India, Lok Sabha, "The Electricity (Amendment) Bill, 2022," 2022, http://164.100.47.4/BillsTexts/LSBillTexts/Asintroduced/187_2022_LS_ENGLISH.pdf.
12. Government of India, Prime Minister's Office, "English rendering of the text of PM's address from the Red Fort on 75th Independence Day", Aug. 15, 2021, <https://pib.gov.in/PressReleasePage.aspx?PRID=1746062>.
13. KPMG India for Government of India, Ministry of Coal, "Strategy for achieving 1 Bn Te+ production by CIL and country," February 2020, <https://coal.gov.in/sites/default/files/2021-01/Strategy-for-achieving-1BT-production-by-KPMG.pdf>.
14. Government of India, Ministry of Petroleum and Natural Gas, "Hydrocarbon Exploration and Licensing Policy (HELP) – A Win-Win approach," 2022, <https://mopng.gov.in/en/exp-and-prod/help#:~:text=In%20the%20line%20with%20the,in%20the%20Indian%20sedimentary%20basin>.

About the Authors

Pranati Chestha Kohli is a Research Assistant with the India program at the Center on Global Energy Policy and a graduate student at Columbia University's School of International and Public Affairs. Her studies focus on climate finance and corporate sustainability. She recently completed the EDF Climate Corps Fellowship with JLL's Sustainability team.

Dakshesh Pranav Thacker is a Research Assistant with the India program at the Center on Global Energy Policy (CGEP) and a second year MPA candidate at Columbia University's School of International and Public Affairs. He previously worked with the food systems research group at CGEP and has been a development sector professional in India for five years, most notably as a Teach For India Fellow.

Amit Khatri is a bureaucrat with the Indian Administrative Services, and has been a hands-on development practitioner over the last 10 years. As a Research Assistant with CGEP, he has contributed to ongoing research and publications on electric vehicles, decarbonization, and hydrogen.

Dr. Kaushik Deb is a Senior Research Scholar at the Center on Global Energy Policy at Columbia University's School of International and Public Affairs, where his research focuses on policies to achieve a just and efficient energy transition in developing countries, especially the role of oil and gas markets. Prior to joining the Center, Kaushik led the Markets and Industrial Development Program at the King Abdullah Petroleum Studies and Research Center in Riyadh, managing the Center's engagement with Saudi Arabia's Ministry of Energy in supporting the development of short and long term strategies for oil and gas markets to achieve the Kingdom's energy sector objectives.

Before this, Kaushik was the Head, Global Gas Markets in Group Economics in BP overseeing analysis that formed the basis for the investment and trading strategy of the company in natural gas. He also led the gas sections of BP's flagship publications, the Statistical Review of World Energy and the Energy Outlook. Prior to BP, at IDFC (now IDFC Bank), his portfolio included policy research and advocacy on infrastructure and environmental economics issues such as low carbon infrastructure, decentralized electricity services in rural areas, and organized intermediate public transport systems for small towns. He has also guided and implemented research in applied economics in TERI (The Energy and Resources Institute) and was the Programme Director of the MBA Programmes at TERI University.

Kaushik has a Doctor of Science degree from ETH Zürich and a Master of Arts in Economics from the Delhi School of Economics.

ABOUT THE CENTER ON GLOBAL ENERGY POLICY

The Center on Global Energy Policy at Columbia University SIPA advances smart, actionable and evidence-based energy and climate solutions through research, education and dialogue. Based at one of the world's top research universities, what sets CGEP apart is our ability to communicate academic research, scholarship and insights in formats and on timescales that are useful to decision makers. We bridge the gap between academic research and policy — complementing and strengthening the world-class research already underway at Columbia University, while providing support, expertise, and policy recommendations to foster stronger, evidence-based policy. Recently, Columbia University President Lee Bollinger announced the creation of a new Climate School — the first in the nation — to tackle the most urgent environmental and public health challenges facing humanity.

Visit us at www.energypolicy.columbia.edu

   @ColumbiaUEnergy

ABOUT THE SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools.

For more information, please visit www.sipa.columbia.edu