Center on Global Energy Policy at COLUMBIA | SIPA

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Regulatory Progress for Project-Based Carbon Credit Markets: Pre-COP30 Roundtable Summary

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Top discussion points

- Global regulatory momentum for project-based carbon credit markets is building, with interoperability across jurisdictions a critical next phase amid advancing Article 6 negotiations.
- Despite progress on carbon market governance, particularly on the supply side, demand for credits remains subdued due to insufficient regulatory clarity, which raises concerns about reputational risk for buyers.
- Having clarity on the legal status of carbon credits and creating robust data infrastructure for carbon accounting will be essential to improve liquidity and scale up the market.

On November 6, 2025, in the lead-up to the annual UN Conference of the Parties (COP30), the Center on Global Energy Policy (CGEP) at Columbia University SIPA convened a roundtable on project-based carbon credit markets (PCCMs) in São Paulo, Brazil—a country that both hosted this year's COP and is well-positioned to shape the next phase of global carbon markets by leveraging its experience in nature-based solutions.[1]

The roundtable discussion, which was held under Chatham House Rules, built on a similar convening organized by CGEP during NY Climate Week[2] that explored whether countries should adopt national regulatory frameworks to help scale up PCCMs by restoring investor trust, especially as compliance systems allow increased credit use and the Paris Agreement's Article 6 becomes operational.

Bringing together government officials, regulators, standard setters, project developers, financial sector participants, and other experts and stakeholders[3] from across the carbon credit value chain, the roundtable in Brazil addressed the following questions:

- What specific policy measures can accelerate the development of demand-side regulations and better integrate the use of voluntary carbon credits into compliance frameworks?
- In the pursuit of interoperability, how can global regulatory alignment be balanced with flexibility across jurisdictions?
- Does the existence of different legal classifications for carbon credits across jurisdictions—e.g., financial instrument, commodity, novel asset—impede interoperability? How does it impact enforcement and investor protections?
- Can national frameworks for PCCMs be designed in ways that support domestic mitigation ambitions while complementing soon-to-be operational Article 6 mechanisms?[4]

The following is a summary of the discussion that took place through five key insights.

Regulatory Momentum Is Accelerating, but the Pace of Implementation Varies across Jurisdictions

Participants broadly agreed that regulatory momentum for PCCMs globally is building. A veteran of carbon markets said they finally observed signs of a positive inflection point in the evolution of this market after they repeatedly failed to take off during the previous decades. This would be a welcome development since, as another participant noted, carbon markets can play an outsized role in helping the world meet its decarbonization targets. They can do so, the participant suggested, through the multiplier effect, with every dollar invested in them potentially mobilizing up to ten times that amount in terms of economic impact. Another expert pointed out that since climate risk can be seen as sovereign risk, carbon credits should be bought as investments whose price can be expected to go up. In this regard, as one participant observed, regulations for project-based carbon credits can help build integrity and support demand.

Several participants noted that countries such as Brazil, Singapore, the United Kingdom, and South Africa are demonstrating tangible progress in transitioning from voluntary, fragmented approaches to regulating PCCMs to more formalized and coordinated systems through new legislation and institutional structures as well as clearer market rules. Some highlighted Brazil's establishment of an emissions trading system and how the interim carbon market secretariat exemplifies this shift toward enforceable frameworks. Similarly, as a few participants noted, other jurisdictions are

embedding quality criteria, disclosure requirements, and transition plans into the regulations to make them increasingly operational.

One contributor drew comparisons between the development of PCCMs and how other financial markets have evolved, observing that regulation has often followed, rather than led, market growth. In regard to traditional instruments such as commodities, bonds, and derivatives, the contributor noted that formal policy frameworks eventually codified practices that had already proven workable. Applying this perspective to carbon credit markets, they suggested that regulation is likely to evolve similarly—through gradual alignment between market practice and policy, rather than through a purely top-down design.

At the same time, participants acknowledged that the implementation of new frameworks remains uneven. One expert noted that many governments are taking a holistic approach to carbon market design for the first time by integrating compliance and voluntary markets, but that developing rules, systems, and administrative infrastructure is slower and more complex than anticipated. Another contributor emphasized that although markets may be technically ready, government and corporate actors often face capacity constraints in interpreting regulations, meeting compliance obligations, and coordinating across multiple national and sub-national agencies. Several participants described these institutional limitations as a make-or-break factor in countries' attempts to operationalize their frameworks, pointing to the need for regulatory clarity and education.

Regulatory Clarity Can Support Demand and Strengthen Credit Integrity

Participants emphasized that while progress on carbon market governance is evident, stronger regulation and institutional support are needed, especially on the demand side. Specifically, participants underscored the need to provide companies with a "safe haven"—a predictable and legally secure environment for using carbon credits that does not expose them to reputational or compliance risks. Several participants observed that buyers are increasingly wary of inconsistent rules across jurisdictions, greenwashing claims, and vilification for buying credits—all of which has constrained demand even for verified credits.

Others noted that widening the recognized uses of carbon credits—such that a single verified unit can serve multiple types of obligations—could strengthen buyer confidence and increase demand. Several participants argued that there is significant latent demand for carbon credits, especially those with hybrid use cases. One participant cited the example of forthcoming demand for carbon credits from the Scope 3 emissions that are likely to follow the sharp increase in demand

for gas-fired turbines. As one expert explained, for that demand to materialize, buyers need clear, standardized guidance on claims and accounting treatment backed by the government.

One participant added that many demand-side initiatives worldwide are increasing the risk of fragmentation, which can be addressed through clear government guidance. On this issue, participants discussed the need for clear rules on disclosures from buyers, including requiring them to purchase carbon credits in accordance with the mitigation hierarchy (i.e., ensuring that internal abatement takes priority).

On the supply side, by contrast, one expert stated there has been far greater convergence of what are considered high-quality credits. Other contributors noted, however, that while frameworks such as the Article 6.4 mechanism—which creates a centralized, United Nations–supervised carbon market mechanism for trading high-quality carbon credits—and the Integrity Council for the Voluntary Carbon Market (ICVCM) Core Carbon Principles are raising supply-side standards, the proliferation of methodologies and initiatives risks renewed fragmentation. Overall, participants viewed convergence around consistent criteria, monitoring, and disclosure as essential for maintaining credibility and scaling high-quality supply.

Several participants noted that ensuring the integrity of carbon credits now comes at a higher cost—project developers face stricter methodologies, rising verification expenses, and greater scrutiny from civil society—underscoring the need for regulatory clarity and technical support to keep viable, high-impact projects financially sustainable. One participant added that regulations need to be stable for them to be effective. Another suggested that rules and methodologies are changing at such a rapid pace that project developers are having difficulty adapting, in addition to the challenge of shouldering the higher costs associated with new, stricter methodologies. This participant added that many projects may not survive, but those that do will be high-quality ones.

The discussion suggested that confidence on the demand side must develop in parallel with integrity on the supply side. Participants noted that buyers will only engage if they can transact under clear, durable rules that minimize legal and reputational risks, and that supply-side integrity standards are also needed to ensure that what is being purchased retains credibility and value. Several participants emphasized that these two dimensions are interdependent—robust oversight for credit generation and a stable operating environment for buyers must advance together to rebuild trust and scale participation across the carbon-credit lifecycle.

Interoperability Is Essential, Especially as Article 6 Negotiations Advance

Participants broadly viewed interoperability as a key priority for the next phase of carbon market regulatory development. Several experts observed that as Article 6 negotiations advance, countries are designing domestic frameworks that can connect to international mechanisms and support cross-border trade in credits. One participant highlighted the cases of Indonesia, India, Japan, and Brazil, whose national governments are structuring their registries, methodologies for credit integrity, and verification processes to align with international standards. Several participants also highlighted the coalition on compliance carbon markets that Brazil is proposing at COP30 as a positive step toward harmonizing standards to improve market liquidity.[5]

Another participant pointed out that Article 6.4 negotiations, after a decade of effort by nearly 200 countries, are now entering the technical stage, wherein decisions on methodologies, permanence, and eligible project types will be made. They noted that these technical deliberations are important because they will directly influence the quality of compliance markets and the corresponding adjustments that will need to be made, both of which are critical to the credibility of international carbon trading.

Participants also emphasized that interoperability depends on aligning national regulations with international standards, including those of the International Organization of Standardization (ISO), Article 6, and domestic registries, into a coherent framework that allows credits to move seamlessly across systems without duplication or loss of integrity. Some underscored that the current proliferation of national registries and data infrastructure systems, in particular, has exacerbated an already fragmented landscape and called for greater consolidation and standardization.

One expert cited the unique case of Indonesia, which recognizes credits issued by standards such as Gold Standard and Verra while requiring them to be recorded in the Indonesian national registry. This approach supports the implementation of corresponding adjustments and demonstrates how domestic frameworks can integrate international standards without compromising national oversight.

More broadly, the discussion reflected broad agreement that interoperability is not a secondary technical issue but the structural backbone of a credible global carbon market—one capable of connecting domestic action with international ambition under Article 6.

Some contributors cited examples of consistency across international frameworks from the energy and transport sectors, such as the International Maritime Organization (IMO), which regulates

emissions from global shipping, and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which governs the use of offsets for international flights. Participants noted that greater alignment between these sectoral systems and national carbon-market policies is essential to prevent fragmentation.

One expert observed that Brazil's current Sustainable Aviation Fuel mandate focuses exclusively on greenhouse gas emissions reduction targets for domestic operations and does not recognize the use of carbon offsets toward compliance, illustrating how policy gaps can limit flexibility and further fragment the market. Addressing such discrepancies is critical to ensuring that carbon credit systems interact coherently with broader sectoral decarbonization measures.

Clarity on the Legal Status of Carbon Credits Is Fundamental to Increasing Market Liquidity

One participant shared that in most jurisdictions, the legal status of carbon credits remains ambiguous, with some treating them as provisions and others as securities. They noted that this uncertainty limits the ability of market participants to pledge credits as collateral, integrate them into financial instruments, or attract institutional investors—constraining liquidity and overall market confidence. They added that the standardization of legal treatment across markets is key to encouraging the trading of credits across jurisdictions.

Another contributor pointed out that Brazil has chosen to classify carbon credits as securities, placing them under the supervision of the country's securities regulator. They observed that this move not only provides the necessary legal oversight but also relieves other Brazilian authorities of the burden to do so, thus freeing up resources that can be deployed to create needed carbon market infrastructure.

Another expert described project-based credits as a "common carbon currency," emphasizing that legal clarity and interoperability should enable this currency to be recognized and exchanged across jurisdictions. They noted that regulation must not only define the legal status of credits but also ensure their fungibility, allowing a single verified credit to serve multiple compliance or disclosure purposes.

One contributor stated that carbon credits must ultimately be recognized as assets with defined ownership and enforceable rights, regardless of whether they are treated as commodities or securities in different national contexts. Participants broadly viewed achieving reciprocity and mutual recognition among jurisdictions as essential to enabling cross-border trading and ensuring that credits retain both legal validity and financial value across markets.

Robust Data Infrastructure for Carbon Accounting and Disclosure Is Central to Integrity

Participants concurred that market integrity is strongly linked to the establishment of standardized, machine-readable data systems and infrastructure for carbon accounting and corporate disclosure. One expert observed that in other financial markets, price discovery and transparency depend entirely on reliable data, but that carbon markets still lack a comparable infrastructure. They noted that under South Africa's 2025 Presidency, the G20 formally discussed data standardization for carbon markets for the first time to improve transparency and interoperability. They also cited ongoing efforts by several independent initiatives to produce a functional data model jointly with the United Nations Framework Convention on Climate Change (UNFCCC) that can create carbon credit identifiers, which could evolve into a consistent system similar to International Securities Identification Numbers (ISINs) (the twelve-character alphanumeric codes used in traditional investment markets to uniquely identify every stock, bond, and security worldwide).

Participants viewed establishing a centralized and interoperable architecture for credit identification and tracking as critical to improving transparency, comparability, and integrity across registries. One participant observed that the current approach, where each registry or organization issues its own inconsistent identifiers, creates a "pulverized market." Participants emphasized that standardization should apply across both voluntary and compliance markets, supported by clearer accounting and disclosure requirements that strengthen investor confidence. They concluded that the shared goal of all stakeholders in the PCCM ecosystem is to develop common rules for data, accounting, and transparency that can underpin a more unified and credible global system for carbon credit markets.

Notes

1. Gautam Jain, Shubham Deshmukh, Luisa Palacios, Victoria Barreto Vieira do Prado, and Preetha Jenarthan. "Climate Leadership Opportunities for Brazil at COP30", Center on Global Energy Policy, Columbia University, November 03, 2025, https://www.energypolicy.columbia.edu/climate-leadership-opportunities-for-brazil-at-cop30/.

2. Gautam Jain, Preetha Jenarthan, Luisa Palacios, Victoria Barreto Vieira do Prado, and Shubham Deshmukh, "Regulatory Approaches for Project-Based Carbon Credit Markets: Roundtable Summary," Center on Global Energy Policy, Columbia University, October 28, 2025, https://www.energypolicy.columbia.edu/publications/regulatory-approaches-for-projectbased-carbon-credit-markets-roundtable-summary.

3. Participants at this event also included representatives from multilateral organizations, standard-setting and integrity initiatives, registries, rating agencies, trading platforms, philanthropic foundations, and research and policy institutes, as well as project developers and buyers.

4. Gautam Jain and Shubham Deshmukh, "How to Fully Operationalize Article 6 of the Paris Agreement," Center on Global Energy Policy, Columbia University, September 11, 2025, https://www.energypolicy.columbia.edu/publications/how-to-fully-operationalize-article-6-of-the-paris-agreement/.

5. Mayara Souto and Fabiana Otero, "Carbon Market Coalition Welcomes 18 Member Countries at COP30," COP30 Brasil Amazonia Belém 2025, November 15, 2025, https://cop30.br/en/news-about-cop30/carbon-market-coalition-welcomes-18-member-countries-at-cop30.

About the Authors

Dr. Gautam Jain is a Senior Research Scholar at the Center on Global Energy Policy (CGEP) of Columbia University's School of International and Public Affairs (SIPA). He focuses on the role of financial markets and instruments—including thematic bonds, blended finance structures, and carbon markets—in the energy transition, with an emphasis on emerging economies.

Dr. Jain has an extensive background in the financial industry where he covered emerging markets as a portfolio manager and strategist. He has worked at asset management firms and an investment bank, including The Rohatyn Group, Barclays Capital, and Millennium Partners. He has helped manage emerging market local debt and hard-currency bond portfolios, encompassing currencies, interest rate instruments, and sovereign credits. He specialized in portfolio construction and asset allocation incorporating macroeconomic, policy, and political developments in emerging markets.

He holds a Ph.D. in Operations Research from Columbia University. He also has an M.S. in Industrial Engineering from Iowa State University and a B.Tech. in Mechanical Engineering from the Indian Institute of Technology, Bombay. He is a CFA charter holder, a Cornell EMI Fellow, an Adjunct Professor at Columbia University's School of International and Public Affairs, and a consultant for the United Nations to support the workstream of the Global Investors for Sustainable Development (GISD) Alliance on "Tackling Local Currency Risk".

He has co-authored publications in the Journal of Derivatives, the Journal of Banking and Finance, the Journal of Applied Probability, Probability in Engineering and Informational Science, and the International Journal of Production Economics. He has also contributed chapters for the 2020 and 2021 Cornell EMI Annual Reports.

Preetha Jenarthan is a Senior Research Associate at the Center on Global Energy Policy (CGEP) within Columbia University's School of International and Public Affairs (SIPA), where she focuses her research on mobilizing capital for clean energy and low-carbon infrastructure development. Prior to joining CGEP, she was a climate finance professional with experience in sustainability strategy, including decarbonization pathways for hard-to-abate sectors. At CIMB Group, a leading Southeast Asian bank, she helped develop and operationalize a five-year sustainability roadmap, elevating its Dow Jones Sustainability Index ranking from the bottom to the top quartile within three years.

Her responsibilities included overseeing programs with cross-functional teams across the region, which involved developing sustainable finance sector policies, driving sustainability-linked corporate finance and debt capital market transactions, and advising clients on their transition action plans. She also designed an ESG risk framework to incorporate climate-related risks into credit assessments and the organization's risk appetite statement. Additionally, she supported regulatory initiatives for the Joint Committee for Climate Change, co-chaired by the Central Bank and Securities Commission of Malaysia, including the Climate Change and Principle-based Taxonomy, the Value-Based Intermediation and Investment Impact Assessment Framework sectoral guides for renewable energy and energy efficiency, and organizing their inaugural climate finance conference. She also played a key role in incubating the CEO Action Network, driving policy advocacy with the public sector, capacity-building efforts, and collective commitments on climate action and social stewardship for over 50 private sector organizations across energy, finance, and other industries. She was also a member of several working groups on climate finance, including the UN Principles of Responsible Banking Impact Reporting and Disclosure task force.

Earlier in her career, Preetha was a Business and Strategy Associate at American International Group (AIG) Malaysia, where her responsibilities included conducting business analytics to optimize profitability and ensure capital adequacy, managing digital partnerships, and leading a new market entry strategy proposal for the Asia Pacific region. She holds a master's degree in Economic Policy Management with a concentration on Energy and Environment from Columbia University and a bachelor's degree in Actuarial Science and Finance with a minor in Economics from Drake University.

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She was the Chairwoman of Houston-based Citgo Petroleum Corporation during a critical period in its history, as it faced significant geopolitical, financial, operational, and legal challenges. As Citgo's first-ever chairwoman, Palacios also shaped efforts to strengthen corporate governance, ethics, and social responsibility.

Before her time at Citgo, Palacios was a Senior Managing Director and member of the management committee of Medley Global Advisors, a NY-based energy and macro policy research firm. She headed Medley's Latin America's economic and energy practice and later the firm's emerging market research team. She previously worked at Barclays Capital as a Director in the emerging markets research department in New York and as an economist in the risk department at Société Générale in Paris. She also worked as Senior Economist at the Japan Bank for International Cooperation and as a Consultant in the Office of the Chief Economist for Latin America at the World Bank in Washington, D.C.

She graduated from Universidad Católica Andrés Bello in Caracas, Venezuela; received a master's degree in international affairs from Columbia University's School of International and Public Affairs; and obtained a Ph.D. in international affairs from The Johns Hopkins University School of Advanced International Studies.

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Mr. Zoffer currently leads the climate tech investment practice at Clocktower Ventures, an early-stage venture capital fund. From 2023 to 2024, Mr. Zoffer served as Special Assistant to the President for Economic Policy at the White House National Economic Council (NEC). At the White House, he led the NEC's work on issues at the intersection of climate, energy, and markets, including climate technology investment, climate-related financial risk, carbon markets, energy security, and energy-related sanctions. He also worked closely on trade and supply chain issues, including China-related trade policy.

From 2021 to 2023, Mr. Zoffer served at the U.S. Department of the Treasury, most recently as Senior Advisor to the Deputy Secretary. In that capacity, he served as the Deputy Secretary's principal advisor on economic and foreign policy issues and as his chief speechwriter. He played a key role in many of the Treasury Department's signature policies during this period, including the design and negotiation of the price cap on Russian oil and the implementation of the Inflation Reduction Act. He also co-led the negotiation of the U.S.-Japan Critical Minerals Agreement. He is a recipient of the Treasury Medal.

Mr. Zoffer also served on both the Biden-Harris Presidential Transition Team and the Clinton-Kaine Presidential Transition Team and advised the Biden-Harris campaign on economic policy issues. Before serving in government, Mr. Zoffer worked at Cove Hill Partners, a technology-focused private equity firm, and in McKinsey & Company's New York Office.

His writing has been published in the New York Times, Wall Street Journal, Financial Times, Washington Post, The Atlantic, Foreign Affairs, The New Republic, and others, as well as academic journals such as the Yale Law Journal and Stanford Law Review. A native of Chapel Hill, NC, he graduated with an A.B. in Social Studies from Harvard University and a J.D. from Yale Law School.

Shubham Deshmukh is a Master's candidate in Sustainability Management at Columbia University and is researching carbon-market regulatory architecture at the Center on Global Energy Policy at Columbia University SIPA. He is compiling a comparative stock-take across global jurisdictions of project-based carbon-credit regulations and analyzing Article 6 rulemaking from COP 21–29 to evaluate registry interoperability, corresponding adjustments, and share-of-proceeds design. Prior to joining Columbia University, Shubham worked with Indian start-ups, where he helped in structuring high-integrity nature-based carbon projects, guided smallholder farmers in adopting regenerative agriculture, and supported the deployment of IoT-enabled precision agriculture systems that raised horticulture yields and resource eciency. He holds degrees in Rural Management and Electrical Engineering.

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