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Regulatory Approaches for Project-Based Carbon Credit Markets: Roundtable Summary

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Top discussion points

- The need for regulations to scale up high-integrity carbon credit markets found consensus at a private roundtable held during Climate Week NYC.
- The development and implementation of demand-side regulations have lagged.
- Interoperability across jurisdictions is necessary and achievable with well-designed regulatory frameworks that can survive shifts in political winds.

Carbon credits are emerging as a key tool for companies to meet a number of objectives, including emission-reduction targets, compliance obligations, investor expectations, and disclosure requirements. Demand for these credits is coming primarily through voluntary carbon markets—the main arena where companies purchase credits to voluntarily offset unavoidable emissions. More recently, demand is also coming from the expanding compliance carbon markets, where some schemes permit the use of such credits to meet regulatory mandates, though with a quality filter and a cap on the share of credits allowed as a percentage of the compliance scheme. As the Paris Agreement’s Article 6—which introduced a framework for voluntary cooperation between countries to achieve their climate targets primarily using carbon markets—gets fully operationalized, further demand could arise.¹

This event summary reflects the authors’ 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.

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Project-based carbon credit markets (PCCMs)—which enable the issuance, use, and trading of credits from projects that avoid, reduce, or remove greenhouse gas emissions—have been growing, with cumulative issuance rising from 196 metric tons of carbon dioxide equivalent (MtCO₂e) in 2018 to 2,489 MtCO₂e in 2025.² While PCCMs have been expanding, the pace of annual issuance of carbon credits has slowed. More specifically, the amount of carbon credit issuances has dropped by 40 percent from the 2021 peak to just over 300 MtCO₂e in 2024. Concerns around credit integrity can partly explain this.

To address these challenges, the Integrity Council for the Voluntary Carbon Market (ICVCM) has proposed rigorous standards for the supply side, and the Voluntary Carbon Markets Integrity Initiative has done so for the demand side. But these standards are voluntary and, therefore, nonbinding. Establishing national regulation frameworks, in theory, could provide enforceable safeguards to improve market trust by ensuring the environmental integrity of credits and help enhance liquidity by supporting interoperability across jurisdictions.

The Center on Global Energy Policy (CGEP) at Columbia University SIPA convened a roundtable of experts and stakeholders³ in the carbon credit ecosystem on September 25, during Climate Week NYC, to explore the question of whether national regulations can indeed help scale up PCCMs. To better understand the need for regulations, the discussion touched on the current state of regulatory approaches for PCCMs across jurisdictions, including the following questions:

- What regulatory approaches for PCCMs are working, where are they falling short, and what discrepancies exist between jurisdictions?
- Are supply-side (carbon credit generation), demand-side (carbon credit use), and market-side (carbon credit trading) dimensions the right areas of PCCM regulation to track?
- How do different legal classifications of carbon credits—such as financial instruments, personal property, or intangible assets—affect interoperability, enforcement, and investor protections?

To follow is a summary of the discussion and the key insights that resulted from it.

Broad Agreement on the Need for Regulations Across the Carbon Credit Lifecycle

Roundtable participants broadly agreed on the importance of developing regulations across the carbon credit lifecycle to ensure consistency and integrity. One expert stated that regulations will be necessary for the voluntary carbon market to eventually merge with the compliance market and scale up to a potential multitrillion-dollar market. Derivatives, for example, are regulated in a coordinated manner across global markets, and carbon markets could follow the same approach.

Another roundtable contributor said governments have become more active in providing the required institutional or regulatory framework for carbon credit markets, generally following one of two paths: participating directly in markets or applying their own standards on a project-by-project basis. They added that while the development of standards has been slow and often challenging to implement, some models, such as the Joint Crediting Mechanism, which is considered the frontrunner to Article 6.2 of the Paris Agreement (more on this to follow), have demonstrated staying power despite their long lead times.⁴

Several representatives noted that it would be more efficient to recognize and build on existing standards, an approach later adopted by the ICVCM, which established its principles relatively quickly. Participants also shared that aligning domestic regulations with national climate commitments, such as nationally determined contributions (NDCs), remains a complex task requiring detailed frameworks to balance domestic targets with international market engagement. These reflections raised questions about how governments can align their resources, capacity, and long-term objectives to sustain engagement in PCCMs, as well as how differing approaches may impact fungibility and overall market coherence.

On the question of whether the regulatory design for PCCMs should treat the supply, demand, and market sides as distinct pillars, one participant said the proposal to do so would need to be fleshed out in detail. Each has different dynamics, such as credible verification on the supply side; compliance-driven criteria on the demand side; and robust data, trading systems, and transparency on the market side. Participants agreed that stronger coordination of regulations is needed to ensure coherence across the broader carbon market architecture and should not be siloed by geography.

Competing Goals in Developing Regulations Pose a Challenge

Several roundtable participants highlighted competing goals that generate friction in developing regulations for PCCMs, including maximizing funding, creating rules for different stakeholders, and ensuring progress toward net zero. A participant noted that some suppliers view the primary purpose of entering carbon markets as increasing revenues and raising capital, while others focus on emissions reductions. They stressed the need to address these tensions across the carbon credit lifecycle and clarify the purpose of transactions. Doing so would directly influence factors such as price and help manage expectations of what carbon markets can realistically deliver.

Participants said managing these expectations is crucial given experiences such as the Clean Development Mechanism (CDM), which was established under the 1997 Kyoto Protocol to allow developed countries to meet part of their emission reduction targets by investing in mitigation projects in developing countries. The CDM proved a disappointment to those who expected it to

generate revenues reliably, leaving many stakeholders, including those in Africa, cautious about new market mechanisms. They noted that similar expectations are now shaping debates around Article 6 of the Paris Agreement, with some viewing it as a revenue-generating mechanism rather than a complement to broader climate ambition. One participant observed that Article 6—and carbon credit markets, in general—should be seen as “the cherry on top of the cake, not the cake itself.”

Risk Ownership and Regulatory Oversight Need Clarification

Various experts at the roundtable concurred on the need to clarify which risks are being regulated and by whom across the carbon credit value chain. One contributor said it is pivotal to define the risks that arise at every stage, including professional liability and reliance on validation and verification bodies (VVBs) during project development as well as questions about whether registries are properly structured to manage risks related to credit issuance, recognition, and transferability.

Some participants stressed that regulation should build on existing frameworks rather than reinvent them, focusing on how financial institutions would handle carbon credits if they were integrated into mainstream financial systems. They said that with credit ratings expanding and financial regulators becoming more active, governance must extend beyond environment ministries to include financial and quality oversight bodies. Another participant mentioned the importance of cross-agency coordination and independent oversight to ensure system-wide risk management.

Other participants believed that while public authorities should retain an approval and oversight role, they should not micromanage, particularly regarding the selection of VVBs and project categorization. They also raised concerns about liability and reversal risk, especially for nature-based projects, where responsibilities for reversals, such as carbon loss from fires, pests, or land-use changes, remain ambiguous. They noted that stronger government oversight could improve project quality and buyer confidence but questioned whether governments can remain agile as the science of carbon accounting and project methodologies evolves, and discussed what role other stakeholders might play in maintaining flexibility.

Development of Demand-Side Regulations Is Lagging

Participants broadly agreed that the lack of demand for carbon credits is problematic and emphasized the urgent need to strengthen demand-side regulations. Several highlighted that while supply-side frameworks within PCCMs have achieved international buy-in, the demand side remains underdeveloped. The absence of clear rules on when and how carbon credits can be used has led to uncertainty and inconsistent market participation. Regulators, these participants stressed, must provide consistent and predictable signals to guide private-sector engagement and clarify the circumstances under which carbon credits credibly contribute to decarbonization goals.

An expert observed that voluntary guidance on the demand side has gained partial uptake among companies but has not reached full implementation largely because governments remain insufficiently involved. They identified two priorities to accelerate adoption: first, creating policy and regulatory conditions that stimulate demand, such as allowing the use of carbon credits in compliance frameworks, and second, reducing transaction costs by simplifying overlapping standards that currently force companies to rely heavily on consultants. Another participant added that the shared principles expected under this year's UN climate conference (COP30) process, led by a government coalition on the voluntary use of high-integrity credits, should be viewed as a starting point for alignment rather than its culmination.

Participants noted the central challenge is building demand through an enabling environment that links carbon credit use to compliance mechanisms and clarifies incentives for decarbonization. They pointed to a contradiction in current market logic: while higher carbon prices are often perceived as signs of ambition, genuine decarbonization requires making credible mitigation options more affordable and accessible. They cited Singapore as an example of a jurisdiction providing clear reasons for buyers to participate, including its compliance scheme that allows liable emitters to use eligible international carbon credits for up to 5 percent of their taxable emissions, and Brazil for its sophisticated, sectoral approach to planning emission reductions under its NDCs. In contrast, they said Germany's court-driven, claims-focused model represents a less effective path, stating that markets should be built through proactive policy rather than litigation.

Finally, experts underscored that inconsistent project ratings and the absence of standardized pricing mechanisms create uncertainty for buyers. Corporate purchasers often depend on intermediaries to interpret project details, while rating agencies may issue divergent assessments for the same project. Establishing a more consistent and transparent rating system—potentially supported by governments—could improve market confidence and price discovery. They suggested that compliance markets may also help address these gaps by offering clearer benchmarks for credit quality and valuation.

Interoperability across Jurisdictions Is Necessary, But Frameworks Should Be Adaptive

Participants largely agreed that improving interoperability and harmonizing market rules across jurisdictions are essential to scaling credible carbon markets. Several contributors mentioned related discussions taking place under the COP30 Action Agenda. One expert questioned how harmonization could be achieved in practice, especially concerning carbon accounting and market rules. This participant suggested that aligning criteria for offset programs and harmonizing measurement, reporting, and verification (MRV) systems could help strengthen

market stability, particularly if policies are anchored in international frameworks that can withstand political transitions.

One contributor stressed that while harmonization is critical, regulatory frameworks must also remain adaptive. They noted that carbon market rules should inherently be iterative and that policy design should differentiate between the evolution of scientific methodologies and the stability of market infrastructure, allowing for timely progress. They signaled that overly rigid regulations could introduce uncertainty for buyers, as methodological revisions may retroactively affect credit validity, undermining market confidence and stability. Building on this point, another expert underscored the need to balance stability with adaptability in carbon market governance. They noted that MRV methodologies have continued to evolve, but governments developing national standards have struggled to keep pace with these evolutions.

Convergence with the Compliance Market Is Essential

Participants generally agreed that converging voluntary carbon markets and compliance schemes is essential to building credible, scalable, and efficient carbon markets. Despite growing alignment between voluntary and compliance markets, the absence of coordination results in a proliferation of standards, registries, methodologies, and MRV systems. A participant stressed that the market must converge and harmonize choices, noting that policymakers do not need a multitude of competing options but rather a few clear, interoperable frameworks.

Roundtable contributors concurred that differences in regulatory approaches and scientific methodologies hinder voluntary market alignment with compliance schemes. Offset credits are not scientifically uniform, making clear classification and consistent eligibility criteria critical for linking voluntary and compliance markets. In the European Union, for example, regulatory tightening under the Emissions Trading System progressively restricted the use of certified emission reduction credits and nature-based categories, fragmenting the market and obscuring which credits qualified for compliance.

Differences in Legal Classification and Registries Could Be Workable

The overall message from many participants was that companies will continue to seek clear, consistent, and predictable frameworks, while governments must ensure interoperability across jurisdictions and define the role of carbon credits within compliance systems. Several participants observed, however, that some degree of divergence across jurisdictions is manageable. Legal classification differences can often be reconciled through existing contract law, provided each jurisdiction clearly defines how credits are treated, what liabilities apply, and what regulations govern them. Ongoing work by several organizations, including UNIDROIT (the International

Institute for the Unification of Private Law), is expected to confirm the treatment of carbon credits as intangible assets, which could help promote consistency in financial accounting.

The discussion also highlighted a divergence in rapidly emerging national registries. While these national registries help strengthen domestic oversight and transparency, they also risk market fragmentation. Some participants emphasized the need for mechanisms to ensure interoperability, noting that differences in information-technology infrastructure have already resulted in cases of fraud and skepticism about the feasibility of large-scale integration. Others, however, maintained that national registries are relatively straightforward to monitor and that achieving interoperability should be feasible with the right systems in place. One participant mentioned that emerging efforts, such as the International Emissions Trading Association (IETA) and World Bank-backed Climate Action Data Trust meta-registry, plus standardization initiatives led by Sylvera and supported by the Glasgow Financial Alliance for Net Zero, aim to improve accountability and comparability across systems.

Article 6 Should Complement PCCMs

Participants also discussed the growing relevance of Article 6 of the Paris Agreement for the design of PCCMs. Article 6 establishes a framework for international cooperation through the transfer of emission reductions, creating the potential to link global carbon credits markets.⁵ Participants emphasized, however, that these mechanisms should complement—not replace—domestic mitigation ambition. While Article 6 can facilitate credit transfers and enhance transparency, it cannot serve as the foundation of climate policy. One expert cautioned that some countries have resisted adopting higher emission reduction targets to preserve flexibility in generating and exporting credits through corresponding adjustments. This approach is increasingly difficult to justify under the Paris Agreement, where integrity depends on aligning ambition with action.

Experts also discussed how countries are navigating the two Article 6 pathways. The Article 6.2 route is more decentralized, allowing host countries discretion to determine eligible projects and bilateral agreements, but risks fragmentation and inconsistent standards. The Article 6.4 mechanism offers a more structured framework, useful for jurisdictions newer to carbon markets and adaptable to bespoke methodologies, such as for coal phaseout projects, often developed in collaboration with multilateral institutions. Participants noted that while the proliferation of bilateral arrangements under Article 6.2 demonstrates growing engagement, transparency and oversight remain limited.

Participants agreed that voluntary, compliance, and Article 6 mechanisms must be viewed holistically rather than in silos. Without detailed national frameworks to align science-based accounting, NDC compliance, and the generation of internationally transferred mitigation

outcomes (ITMOs)—or carbon credits that countries can trade bilaterally under Article 6.2 of the Paris Agreement—markets risk developing in fragmented ways that undercut both environmental integrity and scalability under the Paris Agreement.

Importance of Regulatory Stability and Durability through Political Cycles

Participants underscored that the long-term success of carbon markets depends on regulatory durability—the ability of frameworks to withstand political turnover once markets are established. They cautioned that policy reversals can erode investor confidence and disrupt market continuity, particularly in jurisdictions still developing foundational rules. Participants highlighted the importance of designing “reversal backstops” to protect core elements of market governance—such as credit eligibility, reporting standards, and participation rules—from being undone by successive administrations. Several emphasized that anchoring these frameworks in international approaches or agreements can help insulate them from domestic political shifts, providing consistency, credibility, and investor assurance over time.

Notes

1. 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/>.
2. Authors’ calculations based on data from the “State and Trends of Carbon Pricing Dashboard,” World Bank, accessed September 29, 2025, <https://carbonpricingdashboard.worldbank.org/>.
3. Participants at this event included representatives from governments, multilateral organizations, standard-setting and integrity initiatives, registries, rating agencies, financial institutions, trading platforms, philanthropic foundations, and research and policy institutes, as well as project developers and buyers.
4. Asian Development Bank, “Article 6 of the Paris Agreement: Drawing Lessons from the Joint Crediting Mechanism,” Version II, November 2021, <https://www.adb.org/sites/default/files/publication/747926/article-6-paris-agreement-lessons-jcm-v2.pdf>.
5. 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/>.

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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.

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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.

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Victoria Prado is a Research Associate at Columbia University's Center on Global Energy Policy, where she integrates the Trade and Clean Energy Transition initiative and conducts research on the geopolitics of critical minerals in Latin America. She was the first hire at a successful climate startup in Brazil, where she supported investor rounds, led the business intelligence team, and gained hands-on experience with carbon markets in emerging economies. Victoria also worked at the Rockefeller Foundation, advancing projects to expand energy access, accelerate coal phase-out in Southeast Asia, and deploy clean energy storage solutions in sub-Saharan Africa. Her work lies at the intersection of climate policy, sustainable development, and global energy systems, with a regional focus on Latin America. She holds a Master of Science in Sustainability Management from Columbia University and has experience in advising major players in Brazil's oil, gas, and mining sectors on long-term sustainability strategy.

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 efficiency. He holds degrees in Rural Management and Electrical Engineering.



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