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Governance of Fragmented Compliance and Voluntary Carbon Markets Under the Paris Agreement

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Abstract

Over the past two decades, the emergence of multiple carbon market segments has led to fragmentation of governance of international carbon markets. International baseline-and-credit systems for greenhouse gas mitigation have been repeatedly expected to wither away, but show significant resilience. Still, Parties to the Paris Agreement have struggled to finalize rules for market-based cooperation under Article 6, which were only finalized at COP26 in 2021. Generally, there is tension between international top-down and bottom-up governance. The former was pioneered through the Clean Development Mechanism under the Kyoto Protocol and is utilized for the Article 6.4 mechanism, while the latter was used for the first track of Joint Implementation and will be applied for Article 6.2. Voluntary carbon markets governed bottom-up and outside the Kyoto Protocol by private institutions have recently gained importance by offering complementary project types and methodological approaches. The clear intention of some Parties to use market-based cooperation in order to reach their nationally determined contributions to the Paris Agreement has led to an ongoing process of navigating the alignment of these fragmented carbon market instruments with the implementation of nationally determined contributions and the Paris Agreement's governance architecture. We discuss emerging features of international carbon market governance in the public and private domain, including political and technical issues. Fragmented governance is characterized by different degrees of transparency, centralization, and scales. We assess the crunch issues in the Article 6 negotiations through the lens of these governance features and their effectiveness, focusing on governance principles and their operationalization to ensure environmental integrity and avoid double counting.

Keywords

Article 6; baseline-and-credit system; Clean Development Mechanism; double counting; environmental integrity; fragmentation; governance; Paris Agreement; voluntary carbon markets

Issue

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1. Introduction

International markets for greenhouse gas (GHG) mitigation credits (hereafter referred to as “credits”) have seen a tumultuous history over the past two decades (Michaelowa, Shishlov, et al., 2019). The first “baseline-and-credit” systems for generating carbon credits emerged in the 1990s and have since played a significant role on multiple levels of climate policy. While in

the mid-2000s there was a “gold rush” to develop activities and generate credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol (KP), in other periods, like the early 2010s, many observers speculated that the demise of the international carbon markets was imminent. As the title of this thematic issue “Withering Markets?” shows, this view persists in the early 2020s. However, the reality on the ground has many facets. Despite uncertainties relating to the anticipated

wind-down of the CDM and lack of agreement on the rules for market-based cooperation under Article 6 of the Paris Agreement (PA), there is a flurry of early Article 6 pilots (Greiner et al., 2020). Moreover, record-high volumes of credits are being transacted on the voluntary carbon markets (VCM; Trove Research, 2021). These differing fortunes of various strands of international carbon markets result from a process of fragmentation that accelerated after the failure to agree on a new global climate policy regime at the Copenhagen climate conference in late 2009 (Bernstein et al., 2010; Lövbrand & Stripple, 2012). This article seeks to answer the question of whether fragmentation and institutional complexity will eventually result in the withering of all or some international carbon market segments, or whether the paradigm shift through the PA and new approaches to governance will lead to a flourishing of reconfigured carbon market instruments.

We will first conceptually discuss different features and dimensions of global carbon markets governance before assessing how governance of international carbon markets has developed over time. The subsequent section focuses on the paradigm shift from the KP to the PA. The PA's bottom-up nature creates specific challenges for governance of international carbon markets that are illustrated by the "crunch issues" that were heavily debated in the Article 6 negotiations prior to agreement at COP26. We conclude with our view on which components of international carbon markets are likely to wither away due to governance challenges, and which ones are likely to thrive.

2. Governance Dimensions for Baseline-and-Credit Carbon Market Instruments

Carbon markets are trading a non-tangible commodity, GHG mitigation, to achieve a public good. Usually, public goods require regulation to be mobilized. While VCM are not directly built on regulation, they can only emerge in a situation where there is public pressure for provision of the public good, and buyers of credits on the voluntary market expect a reduced pressure on themselves if they can prove to be "good citizens" or act on their "corporate social responsibility" (Bernstein et al., 2010; Kreibich & Hermwille, 2020).

Demand for carbon credits from a certain crediting standard depends on the legitimacy of the governing institution that issues the credit (Bernstein, 2011). The level of legitimacy and trust is inextricably linked to the governance features of the carbon market, which include rules to ensure environmental integrity of the credits, a procedure for development of methodologies for setting baselines and monitoring, reporting, and verification of activity emissions (ideally involving independent auditors), a process for registration of activities and issuance of credits, and an infrastructure, often called registry, to list issued credits, as well as provisions for publication of relevant documents on activities and their

performance (see Mehling, 2019). A key function of all fully-fledged baseline-and-credit systems is to ensure the environmental integrity of credits, resulting in common principles, criteria, and procedures across all systems (Kollmuss et al., 2008; Michaelowa, Greiner, et al., 2019). What differs across systems and over time are the details relating to (activity and geographic) scope, governance, and operationalization of criteria (Michaelowa, Greiner, et al., 2019).

Based on the concept of a "governance architecture" where multiple organizations, regimes, and norms regulate action (see Biermann & Kim, 2020), we understand governance of carbon markets to encompass the institutional features to oversee a carbon market (e.g., institutional design principles and their material expressions, such as methodologies to determine credits) and agency by different actor types, including in decision-making processes. Governance can be exerted by public or private entities, as well as hybrid variations (see Green, 2013, 2016; Mehling, 2019) and can change over time. Generally, we expect a preponderance of public governance when the climate change problem is taken seriously by governments and citizens; these governments have stringent regulatory control and can implement far-reaching policy instruments. In contrast, in a situation where governments are politically unable to introduce carbon pricing due to resistance of stakeholders (e.g., there is important fossil fuel-related economic activity in the country), the role of private governance will be larger (see Levi et al., 2020, for a discussion). We note that idiosyncrasies of political leaders may influence government positioning, as seen in the cases of Trump and Bolsonaro.

In a situation of expansion of public governance due to increased efforts in climate policy when the political salience of GHG mitigation is high, as has been the case after the emergence of the "Fridays for Future" movement in 2018, private governance systems may be "taken over" or integrated into public systems. For example, in the early 2000s, the governance system created by the World Bank's Prototype Carbon Fund was replaced by the regulation under the CDM and Joint Implementation (JI), due to the KP's entry into force (Michaelowa et al., 2021). A "governance expansion" from the public domain into private-led carbon markets may also happen in the context of the VCM, where Article 6.2 rules could determine key requirements regarding "corresponding adjustments" (CAs) of national emissions balances for credit transactions. Expansion of public governance is likely to lead to the centralization of oversight on international carbon market transactions and greater alignment across approaches, at least with regard to accounting for transfers.

When governments see climate policy as less relevant, as in the period after 2009, when the future of the international climate policy regime was uncertain and public pressure largely absent, there may not be a direct abolition of public governance systems, but they may fall

into disuse, and private systems may emerge. The case of the Gold Standard is illustrative—it first emerged to resolve the CDM’s inability to mandate minimum sustainable development requirements due to host countries’ unwillingness to give up their sovereignty (see Philips et al., 2013). When the CDM market crashed, the Gold Standard metamorphosed into one of the key private governance systems on the international VCM (Green, 2016; Hickmann, 2017; Michaelowa et al., 2018; Streck, 2021a). As private systems have the tendency to evolve through competition and diversification, in a period of increased relevance of private systems, fragmentation is likely to increase. It should be noted that there are now attempts to achieve meta-governance of the international VCM e.g., through the Taskforce on Scaling Voluntary Carbon Markets (2021).

Governance can be exerted on different levels of jurisdictions, ranging from international to sub-national (Bulkeley et al., 2012). There can also be a “cascade of governance,” with principles or guardrails being defined at a high level, while lower-level entities provide specific interpretations or oversight on the operationalization of these principles. For example, under the CDM, each participating country had leeway in defining criteria and indicators for approval of projects and programs. In international carbon markets, there has been a clear trend towards increasingly fragmented governance, as the CDM became less relevant while bilateral alternative mechanisms (e.g., the Japanese Joint Crediting Mechanism [JCM]) and VCM instruments became more relevant. This tendency was reinforced by the shift from the top-down KP system to the bottom-up PA system. The delay in agreeing on multilateral rules for PA-backed carbon markets has further accelerated the fragmentation of the markets, as bilateral cooperation has proliferated in the temporary absence of a new United Nations Framework Convention on Climate Change (UNFCCC) mechanism (Greiner et al., 2020).

A critical aspect of the legitimacy of carbon market governance is the transparency of decision-making (Gupta & Mason, 2016), including the possibility for stakeholders to interact with the institution overseeing the system. Stakeholder consultations and grievance mechanisms are crucial to prevent negative impacts on sustainable development and environmental integrity.

3. Evolution of International Baseline-and-Credit Systems Until 2020

3.1. The Kyoto Era

The KP established both centrally governed and decentralized market mechanisms and forms of cooperation to promote the flexibility and cost-effectiveness of compliance with Kyoto mitigation targets. These governance options accommodate differences in host countries’ capacities to ensure environmental integrity and robust accounting. JI and the CDM are baseline-and-credit sys-

tems with rules governing the generation of units, while International Emissions Trading (IET) enables trading of all types of Kyoto units in line with rules governing the transfers.

JI credits mitigation in host countries with Kyoto targets and associated GHG accounting requirements. JI provided two governance tracks: Track 1 was governed by host countries that met full eligibility criteria and Track 2 by the multilateral JI Supervisory Committee. Whereas under Track 1 most of the governance was delegated from the global to the national level (cascade of governance), under Track 2 most of the governance was retained at the multilateral level. Under both tracks, host countries issued JI units by converting their Assigned Amount Units, thereby avoiding double counting of the same mitigation outcomes towards both the host and buyer country’s Kyoto targets. Multilateral criteria to safeguard environmental integrity applied to both tracks, which were operationalized by host countries and the JI Supervisory Committee, respectively. As an early policy-based alternative to the project-based JI, Green Investment Schemes (GIS) earmarked revenue from the sale of the excess Assigned Amount Units (so-called “hot air”) to specific mitigation policies (Tuerk et al., 2013). GIS represented an additional level of bilaterally-agreed governance for Kyoto units traded under IET in the context of the KP. Due to its voluntary nature, there was no international oversight or transparency requirements for GIS. The lack of transparency and international oversight have undermined trust in the environmental integrity of Kyoto units transferred under GIS and JI Track 1 (see Kollmuss et al., 2015).

Host countries with stringent mitigation targets had the incentive to ensure environmental integrity of transferred units, while economies in transition with lenient targets did not. In addition, host countries also need capacity to overcome challenges related to asymmetric information (Schmitz & Michaelowa, 2005). Applying Track 2 for activities in countries with lenient targets promoted confidence in the environmental integrity of project-based credits. The draft revised JI guidelines (United Nations Framework Convention on Climate Change [UNFCCC], 2016; which were never adopted due to the effective discontinuation of JI after 2012) proposed a single-track JI with some degree of centralized governance for all JI activities, including international minimum criteria and oversight for environmental integrity, transparency, and accountability of decision-making.

The CDM credits mitigation outcomes in developing countries without Kyoto targets, and operates under the authority of the Conference of the Parties, serving as Meeting of the Parties to the Kyoto Protocol, while being supervised by the CDM Executive Board. Due to its prompt start, CDM—building on the Prototype Carbon Fund—pioneered the development of international baseline-and-credit systems through an iterative process, starting with bottom-up development of project-specific

methodologies by project developers, which were approved and sometimes consolidated by the CDM Executive Board. In addition, the CDM Executive Board and its support structure (see Streck, 2007) developed (especially small-scale) methodologies and standardized methodological tools top-down. The CDM was among the international institutions to levy a tax on credit issuances (share of proceeds), resulting in a strongly resourced Secretariat which assumed an influential role in CDM governance and decision-making, and was even perceived as using the CDM Executive Board as a mere rubber stamp (Michaelowa & Michaelowa, 2017). The Clean Development Mechanism Policy Dialogue (2012) identified shortcomings in accountability and transparency of CDM decision-making and recommended formalizing the Secretariat's role in decision-making and setting up a robust accountability system. Regarding transparency of CDM activities, Cames et al. (2016) found a marked increase after 2007, which has facilitated external scrutiny. An important role in CDM governance was played by the national approval authorities. While there were many that essentially rubber-stamped all applications, others did thorough checks (see Friberg, 2008; Fuhr & Lederer, 2010). It has been suggested that, rather than indicating CDM's failure, extensive scrutiny and criticism of CDM by global stakeholders has successfully driven CDM's steady—but often overlooked—institutional evolution (Ahonen & Raab, 2014).

In parallel with the KP's compliance carbon markets, private baseline-and-credit systems emerged to cater to the VCM (Green, 2013, 2016). Such private systems are self-governed and transnational in reach, which will most likely contribute to fragmentation of governance. In the KP era, they focused on host countries that did not have mitigation targets, namely the US and developing countries, thereby avoiding double counting between voluntary purposes and host country targets. Private systems have focused on activity types not covered extensively by the CDM, such as nature-based removals.

National and sub-national governments have also developed baseline-and-credit systems, primarily for domestic compliance purposes (e.g., Australia, California, South Korea) but also for domestic voluntary purposes (e.g., Costa Rica, Peru, and Thailand), as well as for bilateral cooperation (Japan's bilateral JCM; see Jung & Sohn, 2016; and Michaelowa, Shishlov, et al., 2019). JCM governance is special inasmuch as it builds on bilateral joint committees with an equal number of members from Japan and the partner countries. All decisions on methodologies to calculate emission credits as well as issuance of credits are taken by these committees. Although governed at the national level, a "cascade of governance" can be observed as national systems are often based on international principles and guardrails and developed based on policy diffusion and mutual learning (see Wettestad et al., 2018). If used for compliance purposes with national mitigation targets though, more centralized forms of governance will play an essential role.

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) harnesses existing baseline-and-credit systems to source carbon credits that meet CORSIA's eligibility criteria (see Broekhoff et al., 2020). Governance under CORSIA is international, takes place at sector-level and outside the PA, and delegates key functions to selected mechanisms (i.e., oversight on activities implemented and issuance of credits) while retaining the power to decide on eligible standards and credit types.

3.2. Interactions Between Baseline-and-Credit Systems

Many baseline-and-credit systems build on experiences gained under the CDM. For example, JI, operationalized later than CDM, allowed the use of applicable approved CDM methodologies alongside JI-specific approaches (Ahonen et al., 2021). The main private systems, namely the Verified Carbon Standard and Gold Standard, also allow the use of CDM methodologies. Therefore, there are various interactions between compliance and voluntary baseline-and-credit systems, stemming from common features, which in turn drive cross-pollination, governance expansion, and the blurring of boundaries.

Although originally designed to cater solely to voluntary offsetting, private systems have also been approved for compliance use under various carbon pricing systems, such as the Californian cap-and-trade scheme and South African and Colombian carbon taxes (Michaelowa, Shishlov, et al., 2019). Similarly, the CDM, which was originally designed for compliance use towards Kyoto targets, has also been used for voluntary offsetting and delivery of climate finance. Allowances issued under the EU and New Zealand emission trading schemes or credits from the Australian Emission Reduction Fund have also been used for voluntary offsetting (Laine et al., 2021). In addition, some countries, such as Costa Rica, Peru, and Thailand, have developed domestic schemes specifically to mobilize voluntary non-state support for domestic climate action (Partnership for Market Readiness, 2020).

4. International Carbon Markets Facing a Paradigm Shift

4.1. The Paris Era

The PA represents a paradigm shift from the KP in at least two important ways: It introduces the long-term goal of net zero emissions around mid-century and requires all countries to develop and implement mitigation targets (Nationally Determined Contributions [NDCs]) to collectively reach this goal. In addition, there is a growing number of net-zero—even net negative—emission targets by state and non-state actors, increasingly embedded in national legislation and corporate strategies. These collective global goals mark the end of the division of countries into those with and without targets and blur the distinction between voluntary and compliance-driven,

as well as state and non-state mitigation action. In the Paris era, all mitigation outcomes will, generally, count towards host country NDC targets, unless excluded from national accounting due to specific provisions (or inventory granularity that, for example, does not capture specific types of emissions and removals).

The Paris regime is based on the “ambition cycle,” whereby more ambitious NDCs must be communicated every five years. With increasing NDC ambition and scope, public governance will increase for efforts for which carbon markets constitute important drivers for finance mobilization and cost containment, leaving less room for additional VCM activities (Kreibich & Hermwille, 2020). At a global level, Article 6 is intended to achieve more, earlier, or faster mitigation. Articles 6.2–6.3 govern international transfers of mitigation outcomes, resembling IET and GIS in terms of functions relating to bilateral decision-making, while Article 6.4 establishes an international, centrally governed baseline-and-credit mechanism (hereafter Article 6.4 Mechanism [A6.4M]), which resembles the CDM in terms of international governance functions and JI in terms of the need to avoid double counting with host country targets.

High-level criteria for Article 6.2 are set at the PA level, while much of their operationalization are delegated to participating countries. Article 6.2 requires that countries, when engaging in international transfers of mitigation outcomes, promote sustainable development, ensure environmental integrity and transparency (also in governance), and apply robust accounting. They must report on how they are fulfilling the requirements. To avoid double counting, the host country needs to “subtract” any internationally transferred mitigation outcomes (ITMOs) from its national emissions balance to allow the buyer to count the ITMOs for its own purpose. In PA jargon, such “uncounting” is referred to as CAs (Michaelowa et al., 2020).

4.2. Interlinkages Between the Paris Agreement, the Carbon Offsetting and Reduction Scheme for International Aviation, and Private Baseline-and-Credit Systems

To track global progress towards the PA’s collective long-term goal, the provisions for market-based cooperation under Article 6 would need to be applied to all transfers of mitigation outcomes that are used towards this goal, regardless of the system in which the mitigation is used. By authorizing ITMO transfers for “other purposes,” including for CORSIA and VCM use, countries can link CORSIA and private baseline-and-credit systems catering to the VCM with the PA’s requirement (Fearnehough et al., 2020). This is likely to drive mutual governance expansions and further alignment across baseline-and-credit systems. For example, CORSIA’s eligibility criteria for post-2021 vintages of credits are expected to be aligned with Article 6 criteria for ITMOs and require CAs, as per the Article 6.2 guidance. Private systems

for the VCM are preparing to cater to CORSIA demand by “labelling” credits as CORSIA-eligible. CORSIA-eligible credits would also cater to voluntary buyers that choose to use them for carbon neutrality or net zero claims. While there is emergence of some credit providers, especially in the context of removal technologies, in the VCM that try to sell credits without adhering to an established standard, we expect that sooner than later these approaches will vanish, given the challenge to upscale demand for such credits, as happened with similar attempts in the 2000s (see Green, 2016). Finally, private systems may also cater to the Article 6 compliance market. If CORSIA aligns fully with Article 6.2 requirements, a single label could serve both market segments. Otherwise, the compliance market would become fragmented and separate labels would be needed for different compliance purposes. Some Article 6 actors perceive the not-yet-operational A6.4M as the best practice standard for crediting and strive for A6.4M eligibility. This extends the governance expansion from A6.4M to the private systems. This is similar to national Track 1 JI governance systems that built heavily on Track 2 JI that, in turn, drew heavily on CDM that, in turn, significantly influenced the main private systems. These examples demonstrate how the governance expansion blurs the distinctions between centralized, de-centralized, and self-governed, as well as between voluntary and compliance baseline-and-credit systems. This alignment process is dynamic, as rules are regularly revised to reflect lessons and changes in the context.

5. Linking Negotiation Crunch Issues to the Governance Dimensions

The paradigm shift from the KP to the PA and its governance dimensions are reflected in the “crunch issues” of negotiations on Article 6 rules, which prevented agreement at COP24 in Katowice in 2018 and persisted at COP25 in Madrid in 2019, only to be resolved at COP26 in 2021.

5.1. Applying Corresponding Adjustments

The avoidance of double counting through the application of CAs to the emissions balance of NDCs is key to Article 6.2. CAs are applied to “first transferred” ITMOs authorized by a participating Party for use towards an NDC or for “other international mitigation purposes,” the latter covering both international mitigation purposes other than NDC achievement and other purposes determined by the host Party (UNFCCC, 2019a). The authorization of and accounting for ITMO transfers falls under the governance responsibility of the host country.

The host country thus holds an oversight role on ITMO accounting in the PA systems. One of the crunch issues was whether this oversight role also applies to mitigation outcomes not covered by a country’s NDC (Michaelowa et al., 2020; Schneider et al., 2019).

The rationale for the application of CAs is that the broadening of the NDC's scope is not disincentivized, and international oversight on the quality of credits would mitigate risks to environmental integrity (Müller & Michaelowa, 2019; Schneider et al., 2020).

Another crunch issue was the application of CAs to mitigation outcomes authorized for the VCM. Non-authorized Article 6.4 emission reductions do not become ITMOs and do not require a CA. Through the authorization process, countries can apply national and international Article 6 provisions and oversight also to VCM activities and, by extension, to private baseline-and-credit systems. Article 6.2 guidance applies also to credits issued under A6.4M, when they are “internationally transferred” (UNFCCC, 2019a). While there is broad consensus around the introduction of labels in the VCM to identify credits with CAs (Gold Standard, 2021; Verra, 2021), the need to apply CAs to post-2020 mitigation outcomes used for voluntary offsetting claims is still being debated by VCM stakeholders, including private baseline-and-credit system regulators and international initiatives, such as the Taskforce on Scaling Voluntary Carbon Markets, the Voluntary Carbon Market Integrity Initiative, the Voluntary Carbon Markets Global Dialogue and the Nordic Dialogue on Voluntary Compensation. This debate is linked to a broader discussion on the potential role of the VCM in mobilizing non-state financing for mitigation to achieve NDCs, as well as mitigation action that goes beyond current NDC levels, thereby helping to bridge the significant “ambition gap” between current NDCs and the 1.5 degree C pathway (United Nations Environment Programme, 2020).

Formalizing the links between the PA's compliance framework and voluntary market-based action can enhance transnational climate governance (Streck, 2021b). If the link is not established, the consequent double claiming of mitigation outcomes may enable host countries to mitigate less and still achieve their NDC targets (Espelage et al., 2021; Kreibich & Hermwille, 2020). In contrast, providing VCM actors access to PA's Article 6 framework would enable them to bridge the “ambition gap.” Representing a governance expansion, the link's institutionalization will provide clarity and integrate action that has so far been outside the realm of governments' climate governance. The public governance expansion to self-governed modes of governance manifests itself through a “back and forth” interaction between these governance modes. As described above, private standards are considering the introduction of labels for credits. A labelling system regarding use cases proposed by parties for the A6.4M was not retained by COP26.

5.2. Transitioning From the Kyoto Protocol to the Paris Agreement

Negotiations on the A6.4M included discussions on a potential transition of activities, units, methodologies, and infrastructure from the CDM (UNFCCC, 2019b).

While the transition will be important for ensuring the trust of project developers, it might undermine trust-building governance features under Article 6, such as ensuring NDC ambition and environmental integrity (Ahonen et al., 2021). Therefore, the key task for the transition is to assess the CDM activities' compatibility with the new regime and allow only Paris-compatible activities and credits that do not undermine PA implementation to transition to A6.4M (Lo Re & Ellis, 2021).

A particularly thorny crunch issue was the potential transition of CDM credits to the A6.4M (Michaelowa et al., 2020). At the core of the discussion was whether units issued for mitigation achieved pre-2021 can be used towards NDCs. The compromise outcome was a 2013 cut-off date for registration, as CORSIA also determined eligibility of Certified Emission Reductions on this basis (International Civil Aviation Organization, 2021). This represents a further situation of policy diffusion from outside the PA to PA systems. The CDM's uncertain future reduced interest in its use for voluntary purposes, demonstrating the vulnerability of multilaterally governed systems to political disagreement, which do not apply to self-governed private systems.

5.3. Share of Proceeds

Under the CDM, a so-called share of proceeds (SOP) was implemented to cover the CDM's administrative expenses and support adaptation in developing countries. The administrative SOP, based on a monetary fee, was successful in mobilizing significant revenue for CDM operations (Michaelowa & Michaelowa, 2017). The adaptation SOP was implemented by withholding a fixed share of credits upon their issuance and selling them in the international market (Fearnehough et al., 2021). The Doha Amendment expanded the levy of adaptation SOP to JI and IET (UNFCCC, 2012). Whether ITMO transfers under Article 6.2 should contribute to adaptation finance was a highly political crunch issue. For the A6.4M, an administrative and adaptation SOP in the form of a mix of monetary fees and credit shares was agreed by COP26. A sustained source of adaptation finance is of main interest to many developing countries. An argument put forward by opponents of SOPs is that due to its subsidiary nature, cooperation under Article 6.2 cannot mobilize the SOP through a centrally governed, separate account to which 2% of issued credits are transferred, as under the CDM. For instance, ITMOs transferred under Article 6.2 may not be “monetizable” on the global carbon market if they just exist in a government-to-government transfer (as under IET). One argument in favor of SOPs for Article 6.2 is that the operations of the A6.4M must not be disadvantaged compared to cooperative approaches and other transactions on carbon markets (including CORSIA and the VCM; Michaelowa, Greiner, et al., 2019). This shows that, despite their different natures, a certain degree of alignment between the two modes of Article 6 cooperation is pursued on

specific governance features. Different rules for applying SOP under 6.2 and the A6.4M as agreed by COP26 do, increase fragmentation.

5.4. Overall Mitigation in Global Emissions

The delivery of Overall Mitigation in Global Emissions (OMGE) under the A6.4M, resulting in net global emission reductions (in contrast to the CDM's "zero-sum game"), was a controversial crunch issue, particularly its application to Article 6.2 (Fearneough et al., 2021). Some Parties proposed to deliver OMGE via stringent and conservative baselines and consequent under-crediting (compared to the generated mitigation outcomes), with the uncredited mitigation outcomes generally counting towards the host country's NDC. Others called for OMGE to go beyond any NDC and contribute to global mitigation (Michaelowa et al., 2020). Contrary to Article 6.4, Article 6.2 is silent on OMGE and the COP26 decision only "encourages" cooperating Parties to deliver an OMGE. OMGE is effectively an in-kind levy on credits and transfers, and thus opposed by many. In cases where Parties also account for voluntary actions, the question is whether and how this influences the application of OMGE in other baseline-and-credit systems. A related question, though not less contentious, is the level of ambition in baseline methodologies of the A6.4M.

6. Conclusions

The current carbon market landscape comprises multiple market segments, embodying two decades of parallel efforts by various public and private actors. This resulted in fragmentation and complexity and undermined trust in the integrity of carbon markets. This fragmentation was triggered by a loss in faith in Kyoto mechanisms after the failure to establish a robust international climate policy regime in 2009. However, this diversity also contributed to the carbon markets' versatility and resilience to changes in political and economic circumstances, enabling them to evolve to cater to various purposes. To maintain their relevance and integrity in the era of the PA, carbon markets need to continue to align with the global mitigation goals.

The KP established both centrally and de-centrally governed forms of market-based cooperation. In parallel, private, self-governed baseline-and-credit systems emerged to cater for voluntary mitigation action outside the scope of KP targets. Following the rise and fall of credit demand driven by KP compliance, voluntary mitigation action has dominated the landscape in recent years.

The PA regime, too, allows for diversity in market-based cooperation, including both centrally and de-centrally governed baseline-and-credit systems. Efforts to align existing systems and credit use with the PA will promote a certain degree of harmonization across parallel systems in terms of criteria for the generation of credits and accounting for their use. "Governance expan-

sion" and policy diffusion across different baseline-and-credit systems was already evident in the KP era and has accelerated since the adoption of the PA. CORSIA has already aligned certain rules with Article 6 principles and potential rules and has pioneered transitional approaches to CDM activities and credits. The main private systems are preparing to implement labels to distinguish credits that are CORSIA/Article 6-eligible.

Alignment of key criteria and accounting across different baseline-and-credit systems for various use cases facilitates comprehensive tracking of progress towards the global mitigation goal, reflecting both voluntary and compliance-driven support for mitigation outcomes by both state and non-state actors. The PA assigns host countries an unprecedented task of ensuring the environmental integrity and robust accounting of ITMOs authorized for use towards NDC compliance or for other international mitigation purposes and other purposes. We argue that, in order to incentivize global ambition-raising by public and private actors alike, Article 6 accounting rules will need to be applied consistently to ITMOs used towards all these purposes. This was reflected by the adoption of Article 6 rules that enable Article 6 governance to cater also to CORSIA compliance and voluntary offsetting. Further research is needed to explore how to harmonize non-state GHG accounting with national NDC accounting frameworks (Environmental Defense Fund, 2021).

Governance was a cross-cutting dimension in the Article 6 negotiations. Crunch issues related to accounting for use for purposes other than towards NDCs, governance of the CDM transition, the implementation of an SOP under Article 6.2, and the operationalization of OMGE. Regarding the latter two, concerns had been raised that exempting decentrally governed market-based cooperation from such provisions would discourage the use of the centrally governed mechanism and consequently undermine the integrity, equity, and ambition-raising of carbon markets.

In light of the need for a diverse toolbox to support global efforts towards and beyond carbon neutrality, carbon markets are unlikely to wither away any time soon. However, to maintain their relevance in the PA era and contribute to the global mitigation goal in a transparent and credible manner, they will need to align with the PA's goals, principles, and accounting. The public governance expansion will continue if the PA is perceived to be successful in safeguarding integrity. By contrast, if carbon markets are perceived as a race to the bottom, they will lose relevance and ultimately wither away. In this case, carbon market actors may once again resort to self-governing private systems in parallel and fragmented efforts to foster high integrity.

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Conflict of Interests

The authors declare no conflict of interests.

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