



CARBON MECHANISMS REVIEW

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Integrity first!

**The Voluntary Carbon Market must
restore quality and transparency**

**Harvested Wood
Products under Article 6**

The return of an old debate

content

Spring 2023



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editorial

Dear Reader!

2023 will be another crucial year for the international carbon market community. For many Parties, the Article 6.4 is the best way to get access to the international carbon market in a fair and transparent manner. A critical mass of decisions is required to get the system up and running. The Dubai summit should lead to a solid basis so that market participants can build trust in the market and start investing under Article 6.4.

All eyes are on the Article 6.4 Supervisory Body again this year, which has another gigantic task on its desk. Important break-throughs are needed in terms of removal activities as well as on methodologies and baseline setting. We report on options to for Paris-aligned methodology development in this issue, and we also present the outline of one of the most important capacity building initiatives, the Paris Agreement Article 6 Implementation Partnership.

Trust in the rules and requirements is a decisive element of any market-based system. Competitive advantages and disadvantages must be based on the reliability of the service or product being offered. In our cover feature, we take up the recent misguided developments in the voluntary carbon market. In this CMR issue, the German Parliamentary State Secretary Stephan Wenzel lays out why the strict separation of voluntary carbon markets and Paris carbon markets is unacceptable and how governments can support and guide the market towards robust and credible net zero targets in line with the Paris Agreement.

Enjoy the read!

Christof Arens, Editor-in-Chief



Carbon Mechanisms Review (CMR) is a specialist magazine on cooperative market-based climate action. CMR covers mainly the cooperative approaches under the Paris Agreement's Article 6, but also the broader carbon pricing debate worldwide. This includes, for example, emission trading schemes worldwide and their linkages, or project-based approaches such as Japan's bilateral offsetting mechanism, and the Kyoto Protocol's flexible mechanisms CDM/JI. CMR appears quarterly in electronic form. All articles undergo an editorial review process. The editors are pleased to receive suggestions for topics or articles.

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Editor responsible for the content:
Christof Arens, Energy, Transport and Climate Policy Division
Wuppertal Institute for Climate, Environment and Energy
E-Mail: christof.arens@wupperinst.org

Editorial team:
Christof Arens (Editor-in-Chief)
Thomas Forth, Lukas Hermwille, Nicolas Kreibich, Wolfgang Obergassel

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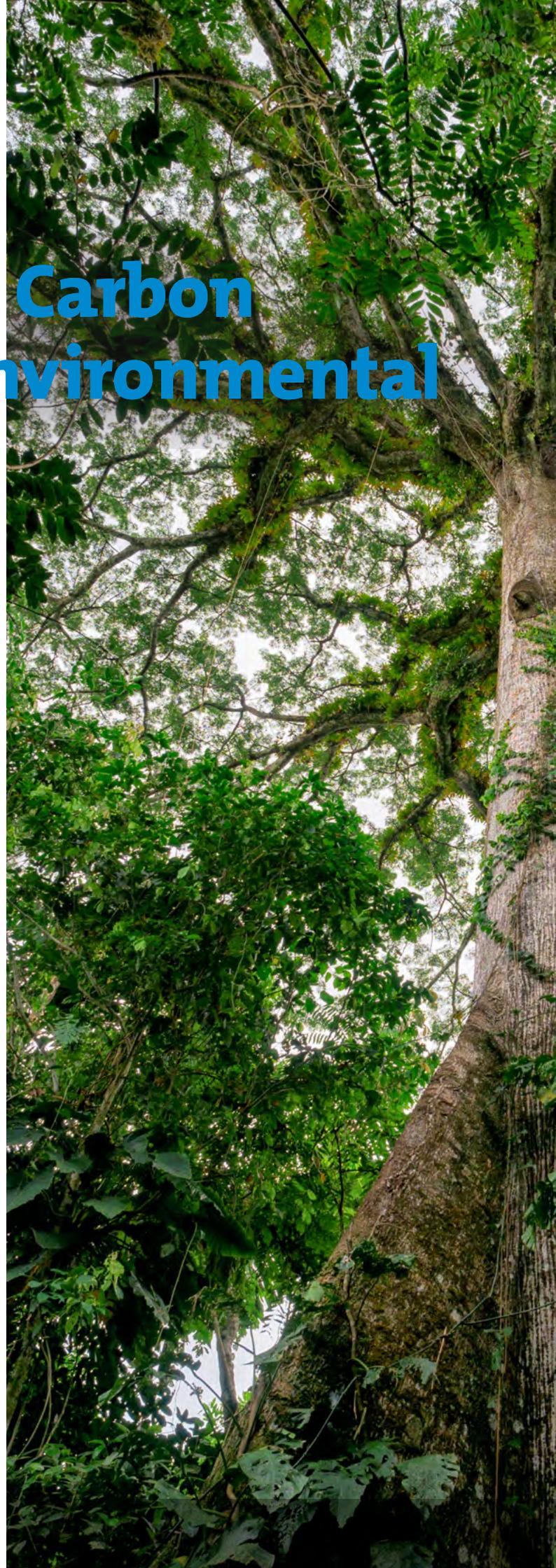
High-Integrity Carbon Markets, No Environmental Risks!

by Stefan Wenzel, Parliamentary State Secretary at the Federal Ministry for Economic Affairs and Climate Action

Before the international climate negotiations on the Article 6 cooperation mechanisms have technically concluded and the renewal of the carbon market can gather pace, familiar problems are emerging in the voluntary carbon market. There is a risk that this market segment could jeopardise the overall social reputation of the Paris Agreement's new cooperation mechanisms. Carbon credits that do not signify increased climate change mitigation, or those used by both buyers and sellers to meet their climate targets, have no place in a trustworthy market. For all those who want to become climate-neutral, every carbon credit must be underpinned by a reliable reduction in emissions.

The question of environmental integrity has recently been raised, most notably in relation to forest protection credits. How can existing forests offset existing emissions? Clearly they cannot, unless more CO₂ can be permanently stored.

This is a significant issue given its scale, but before I examine it in more detail, it is important to take a look at the broader role of the Paris Agreement's cooperation mechanisms.





Context

The EU has refrained from using international credits in its NDC for two reasons. Firstly, it aims to achieve the necessary emission reductions to reach the long-term goals of the Paris Agreement within its own territory. Secondly, the international carbon market under the Kyoto Protocol had already attracted criticism early on, particularly due to the fundamental methodological shortcomings in the methodology of the CDM.

The new market mechanisms enshrined in Article 6, which are intended to increase the mitigation ambitions of the Parties to the Paris Agreement, were not yet available when the NDC was formulated. This was helpful in establishing the climate change mitigation targets as a political commitment in their own right, one that was not watered down by questionable low-cost carbon credits that would simultaneously result in the least expensive opportunities to reduce emissions being bought out from under the noses of developing countries.

The prices for carbon credits must therefore strike a new balance so that measures funded by the revenue from their sale are cost-effective for the host parties but can be supported by the market without credits in the long term. This is the economic aspect of the transformation. We must find a way to make reducing emissions economically expedient. This segment is also the one that leads to acceptable costs for companies that want to become climate-neutral by purchasing carbon credits.

This then raises the question of whether Germany or other EU member states can use the new market mechanisms to pursue goals other than saving money. Paragraph 1 of Article 6 of the Paris Agreement clearly describes the purpose of the cooperation mechanisms: 'Parties

recognise that some Parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions to **allow for higher ambition** in their mitigation and adaptation actions and to promote sustainable development and environmental integrity.' (emphasis added by the author).

The conclusion is self-evident: many developing countries need support if they are to reduce their emissions more quickly and to a greater extent. Article 6 provides for a transparent accounting system for quantified reduction units in order to make progress in this direction in cooperation with developing countries.

But we have not reached that point yet!

In order to actually make use of Article 6, which allows for various forms of cooperation, the outstanding technical decisions mandated at the Climate Change Conference in Glasgow in November 2021 need to be taken this year. Moreover, it is high time this was done, as the window to stay within the 1.5°C limit will close in the next two decades. Article 6.4 of the market mechanism under UNFCCC supervision therefore needs to be ready for implementation following this year's Climate Change Conference in Dubai.

Swift progress in the Article 6 negotiations is also imperative in light of the encouraging growth in corporate interest in offsetting projects. The standards of the voluntary carbon market must now be brought into line with the goals of the Paris Agreement as a matter of urgency. Double counting of carbon credits can only be avoided if users adhere to the accounting rules outlined by Article 6.2 of the Paris Agreement or do not count credits towards

their own mitigation commitments. At the last Climate Change Conference in Sharm-El Sheikh in November 2022, the option was introduced to support host parties – i.e. countries where mitigation activities are carried out – in achieving ambitious climate targets. These activities, referred to as mitigation contributions, must fall outside the respective NDC's own contribution (unconditional NDC), but at the same time go beyond economic measures that can already be financed independently. With its mitigation contributions, Article 6.4 mainly seeks to support developing countries in strengthening their efforts to mitigate climate change. This could give rise to an instrument that may also be useful for intergovernmental financing. It would make it easier to verify which additional emission reductions have been achieved and how this support fits into the implementing countries' long-term transformation strategy to achieve climate neutrality.

Rather than taking place in a vacuum, the new market mechanisms are being developed in a situation where the international carbon market is experiencing a veritable boom in terms of voluntary offsetting. Unfortunately, the high level of corporate interest in the voluntary carbon market is facing increasing criticism – and with very good reason. The criticism relates to both the contribution to the goals of the Paris Agreement and the way carbon credits are calculated. It is essential to avert the danger of credits flooding the carbon market that, instead of helping to combat climate change, block the implementation of important genuine emission reductions that require more commitment.

Protecting forests: sounds good – but is it?

Safeguarding existing forests is a vital task in the international effort to fight climate change. Rather than being the responsibility of individual states alone, the challenge of financing forest conservation (avoided deforestation) is shared by the international community. Even under the Kyoto Protocol, the financing bottlenecks in forest protection policy prompted repeated debates on the question of whether forestry projects, such as afforestation initiatives, could be financed via emissions trading on the carbon market. In this case, scepticism prevailed, not only due to difficulties in estimating the avoided emissions but also because the Kyoto Protocol didn't yet represent a sufficiently reliable framework for climate policy, since developing countries weren't required to make a contribution to global action against climate change at that point. Now, under the Paris Agreement, all states are obliged to set targets to contribute to the Paris Agreement's long-term goal of climate neutrality. Achieving climate neutrality means that greenhouse gas emissions and removals (i.e. taking carbon dioxide out of the atmosphere) must be balanced globally. More and more states are now setting targets to achieve net-zero emissions. Germany has committed to achieving this goal by 2045, and the EU as a whole has set 2050 as its target. Avoided deforestation projects could make an important contribution to reaching this net-zero balance.

Protecting forests on a global level calls, first and foremost, for efforts by all states, but especially by the forest-rich states in both the tropical and temperate zones. Many states that are aware of the need to conserve forests require technical and financial assistance. Forest protection takes place in an environment



An aerial photograph of a lush tropical forest. The forest is dominated by tall palm trees with vibrant green fronds. In the lower-left quadrant, a small, rustic hut with a thatched roof is visible, surrounded by a dirt clearing. The overall scene is a dense, healthy forest environment.

of conflicting interests, ranging from the goal of establishing sustainable forest management policies to out-and-out clear-cutting in the interest of profit alone. Brazil is one example of how a positive shift in avoided deforestation was begun with international support, only to be reversed by the country's last government. The resumption of forest protection policies aimed at saving the Amazon rainforest under Brazil's new president is a matter of international importance.

Avoiding deforestation is a major challenge worldwide, both from a technical perspective and in terms of mobilising the considerable financial resources required. It therefore stands to reason that there is a growing interest in avoided deforestation credits among buyers and sellers on the international carbon market. Companies want and need to reduce their emissions. Some residual emissions are expected to persist, which, in accordance with the long-term goal of the Paris Agreement, will have to be offset using greenhouse gas removals. It also follows that, if all states are endeavouring to reach net zero, the quantity of emissions available for offsetting will decline dramatically in the next two decades. In addition, falling investment costs for renewable energies and other technologies mean that such investments become economically viable and can therefore be made without the proceeds from carbon credits.

'Junk' credits must be withdrawn from the market

Over the last two years or so, there has been an upswing in the voluntary carbon market. Companies are using avoided deforestation credits on a larger scale in pursuit of their net-zero targets. The increased demand has put the largest certifier of these kinds of credits, the Washington DC-based company Verra, in a leading market position. You might think that the first-mover advantage would have provided sufficient incentive for it to act as a role model by designing a reliable funding channel for forest protection with environmental integrity. Unfortunately, that does not seem to have been the case. An international group, which included journalists from German weekly newspaper *Die Zeit*, has carried out in-depth research into this market segment and uncovered deception in the way forest protection credits are generated.

These findings were reported in detail in *Die Zeit* on 19 January 2023. According to the authors, the world's leading certifier of forest protection credits has issued 89 million credits that, instead of helping to mitigate climate change, may actually be harmful, because they mean that legitimate measures don't get the same opportunity to succeed. The article stated that the explanation lies in the deliberate use of inadequate rules (Verra Methodology VM 0007) to quantify the emission reductions achieved by protecting existing forests from hypothetical future deforestation. As a result of this unrealistic, unverifiable reference case (baseline), unjustifiably high emission reductions can be certified and marketed.

Die Zeit calls these credits 'Schrott' (junk) credits, illustrating the dangers facing the new carbon market. This is an issue that must be examined more closely. It is not simply a matter of how the value of the offsetting projects as regards climate policy is publicly perceived. Instead, the most important questions are whether the avoided deforestation projects are actually helping to fight climate change and whether funding raised via carbon credits supports the implementation of avoided deforestation projects or not.

Greenwashing negatively impacts the market

It must be expressly reiterated that the criticism is not directed at all project types, nor at all private issuers of carbon credits. Important operators in the market, such as Gold Standard, do not support the 'avoided deforestation' project category, primarily because of the risk that the emissions baseline could be extrapolated on the basis of speculation and potentially lead to far too many credits being issued.

For the market, however, this is the fundamental problem. How can anyone really tell which carbon credits relate to projects that actually benefit the climate? This question is a concern for companies that want to become climate neutral and tourists who want to offset the carbon footprint of their travels. The lack of consistent standards and supervisory authorities leads to a confusing (voluntary) carbon market, which enables individual providers to systematically dump large quantities of carbon credits onto the market that are harmful to the climate – as in the case of avoided deforestation credits.

Companies end up facing accusations of greenwashing, a danger that UN Secretary-General Antonio Guterres gave an impassioned warning about at the last Climate Change Conference in Sharm El-Sheikh: 'A growing number of governments and non-state actors are pledging to be carbon-free – and obviously that's good news. The problem is that the criteria and benchmarks for these net-zero commitments have varying levels of rigour and loopholes wide enough to drive a diesel truck through. We must have zero tolerance for net-zero greenwashing.'¹ This danger has now become real on a grand scale.

What can be done?

The criticism made by *Die Zeit* is directed at a specific type of project, namely the type linked to avoided deforestation credits. These make up a large part of the voluntary carbon market in terms of volume. However, the criticism serves a useful purpose in improving the methodologies used to identify reference cases and, more importantly, for the ongoing climate negotiations under the Paris Agreement. The demand from some negotiating states for avoided deforestation to be included under Article 6 of the Paris Agreement's cooperation mechanisms will now be met with increased public awareness around the world, strengthening the critical attitude of the EU and other negotiating groups. Decisions on this matter are due to be made at the 28th Climate Change Conference, which will take place in Dubai this December.

One issue that needs to be clarified in the short term is how to deal with the situation on the voluntary market. Legal regulation of the voluntary market would be a contradiction in terms, as no one can be forced to undertake voluntary actions. However, it is possible to encourage, recommend, offer technical assistance towards and recognise voluntary climate change mitigation measures that are undertaken according to proper procedures and achieve good results.

The German Federal Ministry for Economic Affairs and Climate Action (BMWK) has been in talks with companies for some time on how the voluntary market can support the goals of the Paris Agreement. The primary concern in these discussions is to ensure that the voluntary market is compatible with the Paris Agreement's ambition architecture. The BMWK believes that, for voluntary climate targets to be implemented to a high standard, steps must be taken to uphold the environmental integrity of carbon credits on both the demand and supply sides.

On the demand side, this means that companies must first develop an ambitious mitigation strategy for their transition pathway to climate neutrality that is in line with the 1.5°C limit according to scientific principles. This must then be backed up with transparent communication about the type of credit that will be used to offset any unavoidable emissions.

On the supply side, this means that the credits must be sourced from a high-quality certification system. Essentially, this translates to applying robust methodology for identifying and calculating baselines and additionality, disallowing double counting of emission reductions and offsets, integrating mitigation actions into the implementing country's long-term strategy

1 <https://www.un.org/sg/en/content/sg/statement/2022-11-08/secretary-generals-remarks-launch-of-report-of-high-level-expert-group-net-zero-commitments-delivered>



An aerial photograph of a lush tropical rainforest. A dark, winding river flows through the center of the forest, surrounded by dense, vibrant green trees and vegetation. The perspective is from directly above, showing the intricate patterns of the forest canopy and the meandering path of the water.

towards climate neutrality and agreeing on an equitable distribution of additional emission reductions. Furthermore, it is vital that the technical rules and methodologies to ensure the comparability of emission reductions are in place and observed. First and foremost, this is also in the interest of the market; otherwise, how can credits be traded if they represent different contributions towards climate change mitigation? That is why the BMWK views the technical work of the new Article 6.4 Supervisory Body as setting standards for the carbon market as a whole. Among the items on its agenda this year are recommendations relating to greenhouse gas removals and avoided emissions.

The climate deception regarding forest credits that has recently come to light has made it clear once again that the voluntary market cannot be left to run itself. Public standards for the quality of carbon credits are needed, as is transparency for buyers. This is especially pertinent for avoided deforestation credits, which have long attracted criticism, but of course it also applies to all other project types. That is why all participants in the voluntary market need to be involved in discussions in the coming months in order to bring this market segment into line with the goals of the Paris Agreement.

A topic on repeat

Harvested Wood Products under Article 6

by Thomas Forth, Advisor to the Federal Ministry for Economic Affairs and Climate Action



Using harvested wood products is a great way to help sustain the environment. Harvesting wood responsibly helps to ensure that forests are being managed in a sustainable way, which helps to protect the environment and wildlife. By using harvested wood, you are helping to reduce the amount of new forest being cleared and logged, and you are helping to support a healthy and thriving forest ecosystem. Additionally, harvested wood products typically require fewer resources to produce than new wood products, which can help to reduce energy and water usage.

ChatGPT

This is the answer you will get when you are on the artificial intelligence platform.openai.com playground. So why not support the use of harvested wood products (HWP) with every economic and political instrument or mechanism possible including Article 6?

The HWP debate is an upcoming topic. HWPs are a special case of the integration of removals into the long-term balance goal of the Paris Agreement. They are about enhancing carbon stocks. There are similarities to forest conservation regarding the additional carbon sequestration in the activities.

The return of an old debate

While interest in using harvested wood products (HWP) under Article 6 seems to be rapidly growing, whether baseline and credit approaches under Article 6 or in VCM standards could provide the right way of promoting the use of harvested wood products is highly questionable. The challenges and shortcomings of HWP-based activities on the international carbon market are not new. The evolving controversy looks like a revenant of the CDM debate of almost two decades ago. This debate did not end in any real impact on market activities but did provide us with insights into basic findings on the shortcomings and limitations of applying the TACCC principles (transparency, accuracy, completeness, consistency and compara-



Source: [gettyimages.de/filmfoto](https://www.gettyimages.de/filmfoto)

bility) and non-compatibility with the logic of carbon market mechanism. It is assumed that these findings might be valid in principle, and they persist today when it comes to deliberations on introducing HWP mitigation activities under Article 6, especially Article 6.4, or VCM standards. In this respect, there is more or less a duty to look back at the reasons for rejecting HWP in the CDM.

Using more HWP is a good thing!

Before we revisit the CDM key findings, I want to underline the importance of expanding the use of harvested wood products for the climate, as long as the products are made from harvests from sustainably managed forests where biodiversity is protected. If there is good governance, minimized and hedged leakage as well as counteracted reversals, carbon stocks are better able to retain their level of stored carbon.

However, carbon stocks do not depend on well-managed anthropogenic forest activities alone. Other factors may lead to a point where the total HWP pool transitions from a net sink

to a source of emissions and vice versa. In their analysis of the global mitigation potential of carbon stored in harvested wood products, Johnston/Radeloff (2019) pointed to the potential negative impact of macro-economic shocks leading to carbon flux, which make projecting carbon storage in the HWP pool risky or unpredictable. They mention the impact of the collapse of the Soviet Union and the financial crisis in the US as serious negative events of recent decades. Apparently, promotional programs and public regulation have to absorb such macro-economic shocks and must adapt to new economic conditions in order to continue with their objectives. It stands to reason that minor economic shocks at the regional and global levels also impact HWP pools derived from the IPCC guidelines. Beside the challenge of making data from the activity level consistent with IPCC pools, the underlying market mechanisms concept may immediately lead to further challenges.

For baseline and credit approaches, handling both the carbon flux and determination of the baseline is very unlikely. However, Johnston/Radeloff expect the HWP pool to be a growing net sink this decade, as some countries make gains and others do not. It is obvious that, with the set of domestic policies and measures, gov-

ernments play a key role in strengthening the positive trend or counteracting negative developments. And, at first glance, it is understandable that Article 6 seems to be a good opportunity to promote the use of HWP, while dealing with the technicalities of the baseline setting and framing the credit issuance only depend on the willingness of UNFCCC negotiators and VCM standard setters – however, willingness is not the problem.

Building on the CDM findings

We should therefore review what is already known from earlier deliberations on HWP use under carbon market mechanisms. A brief overview of the key challenges for carbon markets already discussed in detail under the CDM leads us to the following main reasons:

1. **Additionality:** In order for a project to be eligible under the CDM, it must be 'additional,' meaning that it would not have happened without the financial support of the CDM. It can be difficult to demonstrate additionality for HWP projects since the harvesting of wood is typically a profitable activity on its own.
2. **Leakage:** Another key requirement for CDM projects is that they must not result in 'leakage,' or the displacement of emissions to another location or activity. For HWP projects, there is a risk of leakage because the harvested wood may be used to displace other sources of wood, such as from natural forests, which could result in additional emissions.

3. **Permanence:** Finally, the CDM requires that emissions reductions be 'permanent,' meaning that they will not be reversed in the future. However, wood products are not permanent carbon sinks, as they will eventually decompose and release the stored carbon back into the atmosphere.

Overall, while HWP projects may have environmental benefits, they do not meet the strict criteria set forth by the CDM for carbon offset projects. Compared to the Kyoto Protocol, where only some of the developed countries (Annex I countries) have committed to real mitigation obligations, countries under the Paris Agreement have committed to mitigation targets under their NDCs, which require a robust accounting system at the national level and especially in the event of international transferred mitigation outcomes (ITMO), which require corresponding adjustments to the emission balance. Therefore, it is obvious that more aspects of implementing Article 6 and Paris-aligned voluntary carbon standards must be addressed and respected, as we saw under the CDM.



What must be fixed along the HWP activity cycle under the new conditions of the carbon market?

What does it mean for HWP if the accounting is considered and conducted at the inventory level? The carbon content of harvested wood products must be subtracted from the inventory, whereby it is monitored and reported under the IPCC guidelines. With this subtraction, the monitoring is no longer covered by the national inventory system and must be reassigned at the product level when it comes to the technical processing of harvested wood as a variety of wood products. The consequence of this is the reporting of product-based sub-pools. Therefore, how the monitoring will require continued reporting in the inventory or a separate system at the product level that might be recognized could be debated and cleared up – in the case of a successful activity, a data report-

ing table adding the storage numbers for the harvesting of wood products monitored over the lifetime of the activity to the emission balance, which it might then be better not to consider as part of the pool.

Regardless of which form of reporting is chosen, derecognition from the HWP pool will be critical for HWP in carbon market mechanisms to enable quantification of the carbon reference for the additional storage phase in products, reminding us that there are processing losses of stored carbon that must be analyzed, subtracted and accounted as losses. The required additionality of carbon markets can be only be found in the carbon content of the product for this kind of activity. The need for transparent calculations at activity level including MRV, subtractions from the HWP pool and recognition in the emission balance while maintaining consistency is self-evident when stored carbon only has to be accounted once. Transfer of ITMOs is only possible if these three layers of accounting are applied transparently.



Source: [gettyimages.de/filmfoto](https://www.gettyimages.de/filmfoto)

What will the carbon leftover from harvested wood be?

Several steps including harvesting, processing, distribution, consumption and termination, i.e., the complete activity cycle, must be taken under MRV. A holistic approach, not allowing accounting loopholes but rather using a specific sequence. The first steps are needed to build the baseline, while the subsequent ones are central to calculating the continued carbon storage amount in the HWP, whereas the question of reversals arises after the HWP is removed from use:

1. Defining the activity boundaries is the very first step, which includes harvesting (before it becomes an HWP), answering the question as to where the HWP comes from and under what management it is produced. Sustainable development, biodiversity and resilience are prerogatives when a use under carbon market regulation is envisaged.
2. In the second step, the material losses during the manufacturing of wood products is calculated against harvesting and the reported numbers for the HWP pool in the

inventory, and then mirrored in the emission balance. This is because extraction from the carbon stock is not the quantitative basis for carbon stored in wood products. The gap between both depends on the product. The question here is how the balance of losses and stored carbon along the value chain can be monitored, verified, and reported, and for how long carbon is captured in wood products. This should be kept in mind when it comes to reflecting on the MRV transaction costs.

3. A third layer of MRV regarding transportation and distribution coming across from harvesting, manufacturing, selling, consuming, post-consumption storage and releases to the atmosphere creates a further layer of MRV in parallel to the activity life cycle. In order for HWP to be accepted by end consumers, this information cannot be neglected and emissions must be counted, contributing to the effectiveness of consumer behavior for promoting climate-friendly products and lifestyles.
4. Therefore, the next step is to establish the monitoring, reporting and verification of each product, which is in the hands of single end consumers and, in the best case scenario, organized small groups of consumers. The same is true for intermediate consumption within manufacturing and production chains. These MRV requirements may lead to a heavy workload to qualify the carbon content at product level regularly. Therefore, at this general level of analysis, the preliminary conclusion to be drawn is that there may be products for which acceptance of relatively high transaction costs is appropriate when it comes to a complete economic assessment of the suitability of the specific use of this instrument.



Source: [gettyimages.de/Stockbyte](https://www.gettyimages.de/Stockbyte)

5. Having adapted the MRV steps to a specific HWP application, the main question is still whether an additional emission reduction or removal has been achieved based on an approved methodology under Article 6.4. And if that cannot be demonstrated, then it has nothing in common with carbon market mechanisms under Article 6. Before jumping to any conclusions, the challenge is to define areas to determine the additionality of the HWP application. As already stated, HWP consideration is based on the expansion of carbon storage in the products. A further option might be that, in certain cases, HWP is used as a substitute for a product that causes higher emissions along its production chain and during application. As with the storage expansion example, this option needs to be considered at the activity level.
6. Finally, the last point of the whole MRV process is consideration of the after-use of the product. Maybe re-use of the product, energetic uses or in some cases deposition due to chemical treatments are possible. The MRV of the post-consumption phase of a HWP only makes sense if there is an interest in quantifying the continued storage effect. If not, it must simply be counted as full release to the atmosphere.

Having finally verified these continued HWP storage amounts recorded under the MRV system, the question remains as to whether a) this is more than a time-limited expansion of the HWP pool as the one positive climate impact or b) there is some climate relevant progress on the emission reductions in regard to substitution products and directly related technical processes with a higher carbon content.

The concept of crediting is challenging for both questions. What might be identified as a basis for crediting? In the end, it is product-based temporarily stored carbon for a), and for b) it falls under the calculation of the baseline if substituted processes and products are covered.

First, we should remember that the temporarily valid certificates we already experienced under the CDM were not attractive to the market. However, among the huge set of HWP products, there might be forms no longer in use, which could contribute to the 1.5-degree pathway and net zero in the transitional period. The broad range of HWP lifetimes shows that there are relevant differences but also challenges regarding the reliability of the data. Such standardized assumptions, even if improved, will not prevent the specific MRV requirements from being implemented. To this extent, the CDM experience must be seen as the definitive answer in regard to temporary limited credits.

The results might be re-accounted in the inventory and the emissions balance as mitigation outcomes (MO) or remain permanently subtracted from the inventory/emission balance for the use of international transfers (ITMO). Both of these accounting options go along with separation from the inventory at the starting point for a specific HWP.

In the case of continued reporting in the inventory, the reporting process will be different and not that simple, but still possible. For those who prefer inventory accounting, using a non-market mechanism without certification and without trading could work.

If it should come to the development of an Article 6.4 methodology, the inventory comparison is only one technical aspect for calculation. The baseline setting must be in line with the requirements under Article 6.4., coverage by the NDC is crucial and defining a long-term perspective is relevant when it comes to Article 6.4 as a compliance tool and use for offsetting, including authorization, corresponding adjustment and ITMOs.

When you use HWP under Article 6.4 without authorization as a mitigation claim, it is a contribution to the domestic NDC.

Cap and trade instead of baseline and credit approaches?

Having identified two options for additional storage under the assumption that the quantitative numbers of the HWP pool in the inventory stay at the same level, it is worth asking about the general eligibility of HWP in carbon market approaches. Besides looking back to the CDM with the baseline and credit approaches, Article 17 KP may provide some insights into the challenges of HWP approaches when it comes to cap and trade. The aforementioned challenges regarding the consistency of data from HWP pools and the activity level remain problematic, maybe more so for the coverage and allocation of a cap and trade system. The granularity challenge for baseline and credit approaches also comes up regarding cap and trade systems, as argued next.

Having the numbers back in the inventory (and not separated), one might consider establishing a kind of inventory trading similar to the Kyoto concept of trading assigned amounts under Article 17 KP, trading in AAUs or RMUs. With the definition of removal units, the special character of removal certification was recognized in the Kyoto Protocol. While the allocation of the assigned amounts was decided in 1997 through political bargaining and general acceptance of different but altogether limited caps, the concept for trading is tied to country-specific caps, which historically have not worked well for reasons of overallocation and lots of hot air. However, the cap setting is crucial. And for HWP, it will not be a traditional cap but rather a target for the expansion of the pool. Then the allocation will be not trivial; which groups of actors might be involved in line with their influence on the use of HWP, including individual persons and groups of persons, for example regarding furniture and housing.

These AAU (RMU) certificates for the assigned amount are issued to countries that have reduced their emissions of certain greenhouse gases to below their assigned target levels, which can then be exchanged for emissions credits on the international carbon market. If the allocation is serious and strict, a loophole – such as the historical overallocation (hot air) that emerged during the first KP commitment period – will not occur. Under Article 17 KP, the basis for international emissions trading in capped systems is laid down as a concept.

Reflecting on this concept for the use of HWP, a cap means limiting the use of HWP. Clearly, this makes no sense when you realize that HWP are one way to limiting climate change. Instead of limiting, expansion is the goal. This does not work with a cap and trade system, but more with a baseline and credit approach that can demonstrate a concrete contribution to the net zero target of an implementing country, which is indicated in its NDC as conditional or unconditional area mitigation activities or not even addressed.

However, some carbon is stored after extraction from the forest and might be captured in products for a longer period which corresponds with defined crediting periods, i.e., the use period of the product is long enough. However, it is also worth considering products with short lifecycles as a measure on the 1.5-degree pathway, if the level of storage is on the macro level, which might be managed under a comprehensive domestic or international cooperative program. What could be credited is the sustained higher carbon content from a certain starting point to a target level fixed in the NDC and within the pathway to net zero. This consideration is useful in cases where you want to manage the additional carbon impact of short- and medium-term activities, while the main impact comes from long-term activities.

However, calculation of the removal effect will remain critical. What you might have achieved with HWP is longer storage, which must first be calculated at the inventory level. The carbon subtracted from the inventory must be reapplied at the level of extraction and only a smaller part of the wood will find a use of several years. If this condition is met, we can observe an additional removal effect. However, this consideration concerns inventories, building on the granularity of the IPCC guidelines. As mentioned earlier, there are several layers of accounting steps that have to be carried out before one comes to transboundary transfers.

From Kyoto reflections to the Paris challenges

So much for the Kyoto reflections on the world. There are other options for the Paris Agreement setting with no allocation of an assigned amount. HWP targets must be voluntarily included in the NDC and the LT-LEDS to net zero. And they must meet the accounting conditions for the transfer of the mitigation outcome. Lack of multi-year targets, trajectories and single year accounting present further obstacles. However, such a system depends on the willingness and ability to mirror HWP completely in the inventory at a scale of activities that would allow trading of units. The difference of the granularity of the inventory data to the level need for carbon market mechanisms becomes a real problem when trading suggestions are based on the IPCC guideline. Trading windfalls from an inventory's grey zone of accounting elasticity could be avoided if the emissions balance were designed to be strict enough for HWP.

Whether Article 6.2 and 6.4 are the right instruments to promote expansion of the use of HWP is highly questionable. Even the rough thoughts on cap and trade presented here already show a level of complexity at the concept level, making such a system undesirable. Baseline and credit systems might also be possible for certain long-term activities only, but this has to be explored in detail regarding methodologies, management and implementation. It is too early for a general recommendation that HWP activities finally make their way into 'baselines and credit' mechanisms. There are far more pros and cons regarding the concept and implementation. Under Article 6, we need something real in delivering ambition beyond current NDCs and business as usual, based on robust accounting and promoting sustainable development. Maybe other instruments without trading mitigation outcomes are fit for this purpose.

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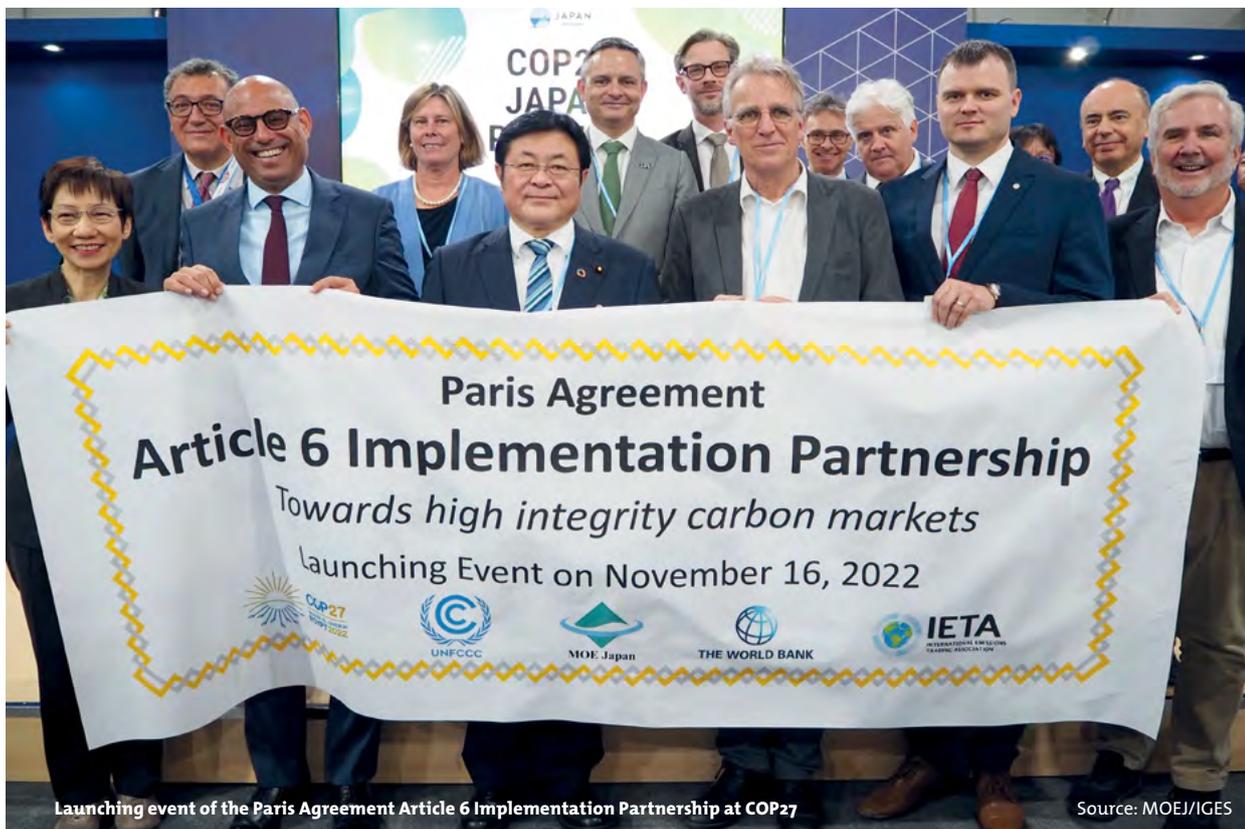
The Paris Agreement Article 6 Implementation Partnership

For swift and robust implementation of high integrity carbon markets

by Sadamitsu Sakoguchi, Kazuhisa Koakutsu, Takayuki Shigematsu, Kotoe Kuroda, and Tatsuya Arima, Ministry of the Environment, Japan (MOEJ)

In order to promote global emission reductions, early and steady implementation of high integrity carbon markets that ensure environmental integrity based on Article 6 of the Paris Agreement is key. To this end, supporting capacity building for countries and relevant stakeholders that implement Article 6 is essential.

The Paris Agreement Article 6 Implementation Partnership was established at COP27 in Sharm el-Sheikh, Egypt specifically for this purpose. At the launch event (Image 1), many of the invited high-level officials emphasized the potential of carbon markets and the importance of capacity building for Article 6 implementation. Mr.



Launching event of the Paris Agreement Article 6 Implementation Partnership at COP27

Source: MOEJ/IGES

Simon Stiell, UNFCCC Executive Secretary, stated that 'effective and swift implementation of Article 6 around the globe can be a game changer in our efforts to tackle global warming.' Mr. James Shaw, Minister for Climate Change and Associate Minister for Environment of New Zealand, further stated that 'capacity building is needed for Article 6 process and market readi-

ness to further build policy foundations in line with NDCs, long-term strategies, and sustainable development.' The number of participants in the Implementation Partnership, which began with about 60 partners, has now grown to 91 partner countries and organizations (as of March 20, 2023) (Table 1).

Table 1: List of partner countries and organizations (as of March 20, 2023)

Countries	Organizations
Andorra, Argentina, Armenia, Australia, Azerbaijan, Bahamas, Bangladesh, Barbados, Belize, Bhutan, Brazil, Burundi, Cambodia, Canada, Chile, Costa Rica, Côte d'Ivoire, Dominican Republic, Estonia, Ethiopia, Fiji, Finland, France, Georgia, Germany, Ghana, Greece, India, Italy, Jamaica, Jordan, Kenya, Lao PDR, Maldives, Mexico, Moldova, Mongolia, Morocco, Namibia, Nepal, New Zealand, Nigeria, Palau, Papua New Guinea, Peru, Philippines, Rwanda, Saudi Arabia, Senegal, Singapore, Sri Lanka, Sudan, Sweden, Switzerland, Thailand, Timor Leste, Tunisia, Uganda, UAE, UK, US, Uzbekistan, Zambia, Zimbabwe	ADB, AfDB, Climate Focus, Eastern African Alliance, EBRD, ERCST, GGGI, Gold Standard, ICAT, IETA, IGES, Perspectives, UNDP, UNEP, UNFCCC, UNIDO, UNU-IAS, WB, West African Alliance, WRI, etc.
64 countries	27 organizations

Overview of the Paris Agreement Article 6 Implementation Partnership

One of the purposes of the Article 6 Implementation Partnership is to ensure that capacity-building support reaches where it is needed efficiently, while avoiding duplication and competition. Based on the Article 6 capacity-building support survey conducted by MOEJ, regional and national gaps between support providers and recipients were identified (Figure 1). From the results, we learned that many capaci-

ty-building programs on Article 6 implementation were provided by various entities, but that, due to the lack of systematic coordination, only a small number of countries had enjoyed their benefits.

The structure of the Article 6 Implementation Partnership (Figure 2) shows the interaction between major stakeholders who play different roles in this Partnership. For example, international organizations enhance global collaboration, Regional Collaboration Centers and regional alliances provide regional assistance and replicate and expand good capacity-building activities locally, research institutes provide technical and hands-on support, and countries

Figure 1: Results of survey on capacity-building support distribution of Article 6

Current status of A6 capacity building mentioning specific country names for implementation

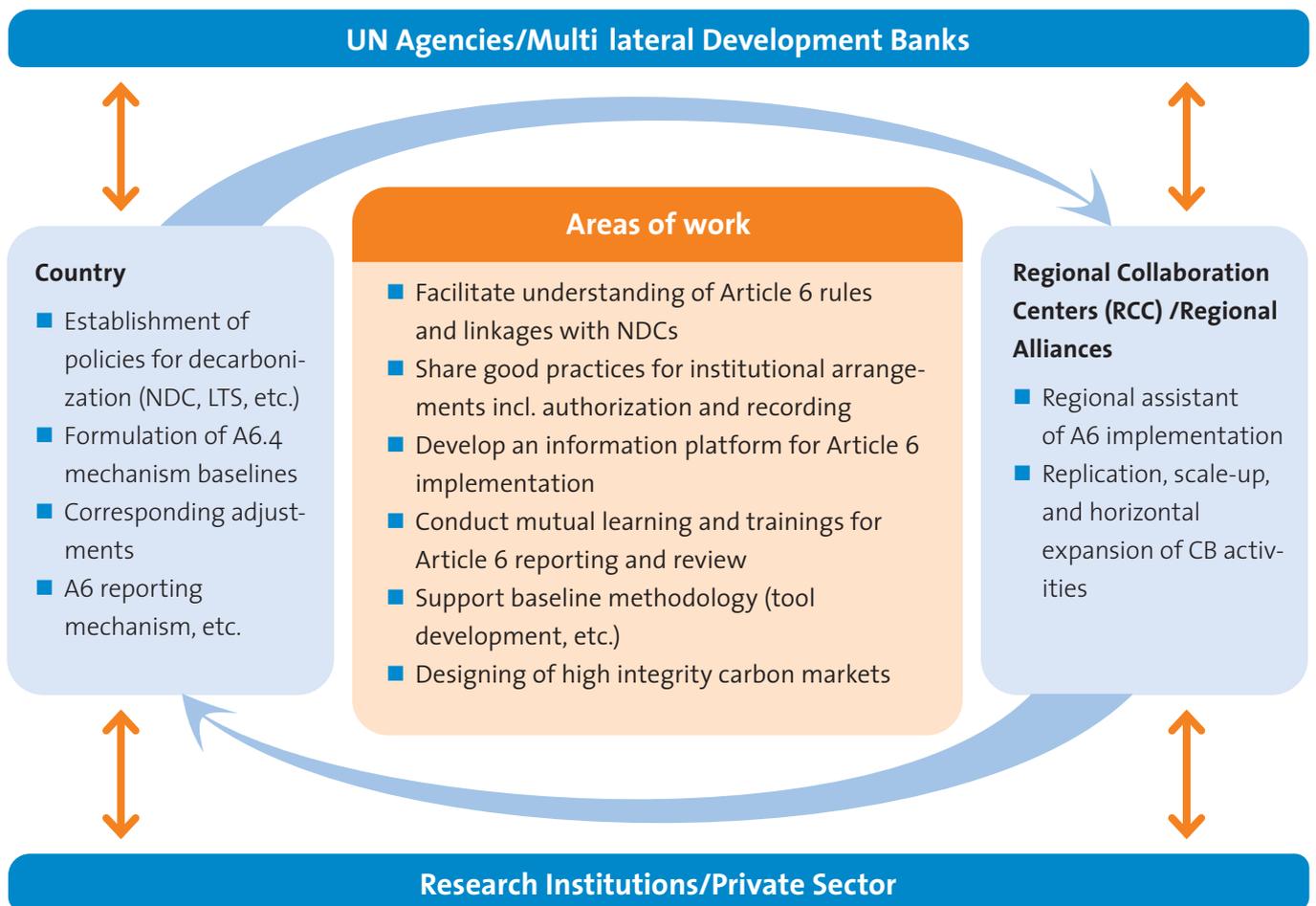
		Asia	Eastern Europe and Central Asia	Europe	Latin America & the Caribbean	North Africa & the Middle East	Northern America	Oceania	Sub-Saharan Africa	All regions
Number of countries indicating the use of A6*		15	7	34	16	5	2	6	25	110
Share of countries with support for A6**	Participation	33%	0%	0%	25%	20%	0%	0%	60%	23%
	Reporting	40%	0%	0%	25%	20%	0%	0%	32%	17%
	Project development and implementation	60%	14%	0%	6%	40%	0%	0%	44%	22%

* Countries indicated as 'Yes' for using at least one type of market mechanism in the 'IGES NDC Database Version 7.6 (October 2021)'.
 ** Data source: 'A6 capacity building survey' results received by MOEJ between Mar.–Sept. 2022.
 *** This analysis is subject to assessment.

build capacity for Article 6 implementation. The Implementation Partnership aims to: (1) promote international coordination of Article 6 capacity building, (2) develop an information platform for Article 6 implementation, and (3) support piloting and knowledge products. In order to achieve these objectives, the Implementation Partnership provides a forum and opportunities to discuss Article 6 capacity building for all interested stakeholders, including countries and organizations.

The areas of work of the Implementation Partnership are to: (1) facilitate recognition of market-mechanism rules and linkages with Nationally Determined Contributions (NDCs) aligned with Article 6, (2) share good practices regarding institutional arrangements, including authorization and recording, (3) develop an information platform for Article 6 implementation, (4) implement mutual learning and training programs for reporting and review, (5) support the development of baseline methodologies, including tool development, and (6) assist in the design of high-integrity carbon markets.

Figure 2: Structure of the Paris Agreement Article 6 Implementation Partnership

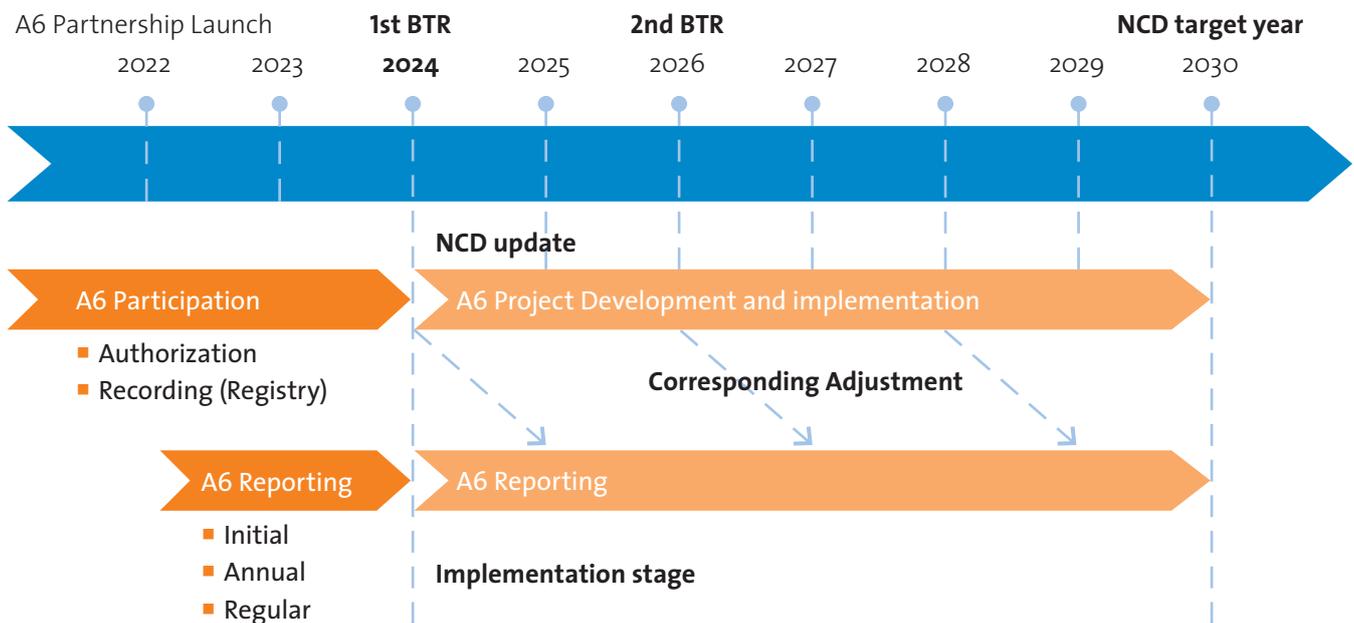


Capacity-building activities of the Article 6 Implementation Partnership

The Article 6 Implementation Partnership provides capacity-building supports, including thematic working groups, an information platform, and technical assistance, taking into consideration the schedule of required actions to be taken by Parties under the Paris Agreement, such as the submission of biennial transparency reports (BTRs) and new or updated NDCs (Figure 3).

The Article 6 Implementation Partnership will apply a phased approach to enable countries to meet the requirements in line with Article 6 of the Paris Agreement. To successfully implement Article 6, the Implementation Partnership will launch thematic working groups covering (A) authorization, (B) reporting, and (C) tracking.

Figure 3: Article 6-related Reporting Schedule under the Paris Agreement



Thematic Working Groups

The Article 6 Implementation Partnership will apply a phased approach to enable countries to meet the requirements in line with Article 6 of the Paris Agreement. To successfully implement Article 6, the Implementation Partnership will launch thematic working groups covering (A) authorization, (B) reporting, and (C) tracking.

A. Authorization

It is stated in Decision 2/CMA.3 that 'Each Party participating in a cooperative approach that involves the use of ITMOs shall ensure that its participation in the cooperative approach and the authorization, transfer and use of ITMOs is consistent with this guidance and relevant decisions of the CMA.' Article 6, paragraph 2 of the Paris Agreement stipulates that Parties need to apply measures to avoid double counting of internationally transferred mitigation outcomes (ITMOs) and, to do so, corresponding adjustment should be applied to all ITMOs. Parties need to make such arrangements to participate in a cooperative approach and ensure authorization in order for mitigation outcomes to be recognized as ITMOs. The Authorization Working Group will provide capacity-building support to government officials on countries' authorization through the sharing of each country's authorization process and institutional arrangements.

B. Reporting

With regard to reporting, Parties participating in a cooperative approach are required to submit three types of report/information, namely an initial report, annual information, and regular information. In the initial report, the Party needs to demonstrate that it fulfils the participation criteria, how it implements the cooperative approach, and how it ensures environmental integrity. The outline for the initial report is: (1) participation responsibilities, (2) a description of the Party's nationally determined contribution,

(3) information on ITMO metrics, method for applying corresponding adjustments and method for quantifying the NDC, and (4) information on each cooperative approach. The annual information is submitted with the status of transfer and use of ITMOs, and the regular information includes information on the status of cooperative approach implementation and NDC achievement. The Reporting Working Group will provide support to develop reporting by applying the Article 6 reporting format.

C. Tracking

In order to record and track ITMOs, participating Parties shall have, or have access to, a registry for the purpose of tracking that records the actions relating to ITMOs, tracks and maintains records and accounts for ITMOs, provides access to the Party and other authorized entities, and produces, maintains, and compiles records, information and data. The UNFCCC Secretariat will develop an international registry for participating Parties that do not have (access to) a registry. In the Tracking Working Group, case studies on the development and operation of registries will be shared to support the development of national registries.

Information Platform

The Implementation Partnership's website <https://a6partnership.org> serves as an information platform where case studies and good practices are collected from and disseminated to partners. The platform is still in development, and more information will be available soon. Currently, information is available on the COP27 side event called 'Sharing best practices and lessons learned from capacity building for implementation of Article 6.' At the event, several countries, international organizations, regional alliances, and the private sector shared their capacity-building-related activities. Ghana, for example, recalled how important cooperation

and coordination among ministries, government agencies, and the private sector was in adopting Article 6. A detailed summary of the event is available on the website.

In addition to developing tools and templates through the WGs and sharing information through the platform, the Implementation Partnership aims to provide practical hands-on trainings, mutual learning, and technical assistance.

Next steps

The first plenary meeting was held on February 20 and 22, respectively, involving the partners of the Article 6 Implementation Partnership and other interested countries and organizations. At the meeting, an overview of the Article 6

Implementation Partnership was presented, including its objectives, outcomes, and schedules. International organizations – UNFCCC Secretariat, World Bank, and International Emission Trading Association – also presented their Article 6 capacity-building activities and plans in line with the Partnership. The first meeting of the authorization working group (WG) also took place on March 15th and 17th. At the meeting, A6IP partner countries and organizations involved in the authorization and institutional arrangements for Article 6 shared information and lessons learnt, and participants discussed the idea of the development of a tool for authorization. A documentation of each of the meetings is made available at <https://a6partnership.org>. The first set of WGs (authorization, reporting, and registry) is due to be completed in May this year.

Benefits of joining the Article 6 Implementation Partnership

As explained above, the Article 6 Implementation Partnership will provide various capacity-building activities, and partners will receive the full benefit of those services.

Benefits of joining the Implementation Partnership include but are not limited to opportunities to:

- share and gain knowledge from best practices and lessons learned on capacity building and implementation of Article 6,
- provide and gain support for capacity building and implementation of Article 6, and
- utilize the information platform for Article 6 implementation.

Broad participation will contribute to strengthening the abilities of both the countries and this Partnership to implement Article 6. To learn more about the Paris Agreement Article 6 Implementation Partnership, please visit the website at <https://a6partnership.org/> or contact the Ministry of the Environment of Japan at a6_partnership@env.go.jp

Consideration of becoming a partner is highly appreciated.

Advancing the development of Article 6 methodologies

Preventing a stalemate that blocks Article 6.4 implementation

by Axel Michaelowa, Aayushi Singh, Juliana Keßler (Perspectives Climate Research)

While international carbon market mechanisms under the Kyoto Protocol were successful in mobilising thousands of mitigation projects in over 100 countries, they were widely criticised for faulty additionality determination, inflated baselines, and negative environmental and social impacts.

With the goal to make the Article 6.4 mechanism (A6.4M) under the Paris Agreement (PA)

more credible than the Kyoto mechanisms, particularly the Clean Development Mechanism (CDM), stringent principles and requirements for baseline and monitoring methodologies were adopted at COP26 in Glasgow (UNFCCC 2022a). The key requirements going beyond those of the CDM are shown in Figure 1 below with those that are increasing stringency shown in orange colour and those that decrease stringency in blue:

Figure 1: Methodological requirements under the A6.4M beyond those of the CDM



Source: UNFCCC (2022a; 2022b)

The Article 6.4 Supervisory Body (SB) was tasked to operationalize these principles and set up the requirements and processes necessary to operate the A6.4M, including development, revision, and approval of new and existing methodologies. The first milestone for this was COP27, where guidance for methodology developers was to be provided by the SB. As per the Glasgow decision, activities requesting transition from the CDM to the A6.4M can continue to apply their CDM methodology until 2025, following which they must apply an approved Article 6.4 methodology (UNFCCC 2022a). Furthermore, Article 6 pioneers like the Swiss Foundation for Climate Protection and Carbon Offset (KliK), the Japanese Joint Crediting Mechanism and the Swedish Energy Agency are applying CDM methodologies in their entirety or only slightly changed for their pilot activities.

Getting into a fight – operationalising the Article 6.4 requirements for methodologies

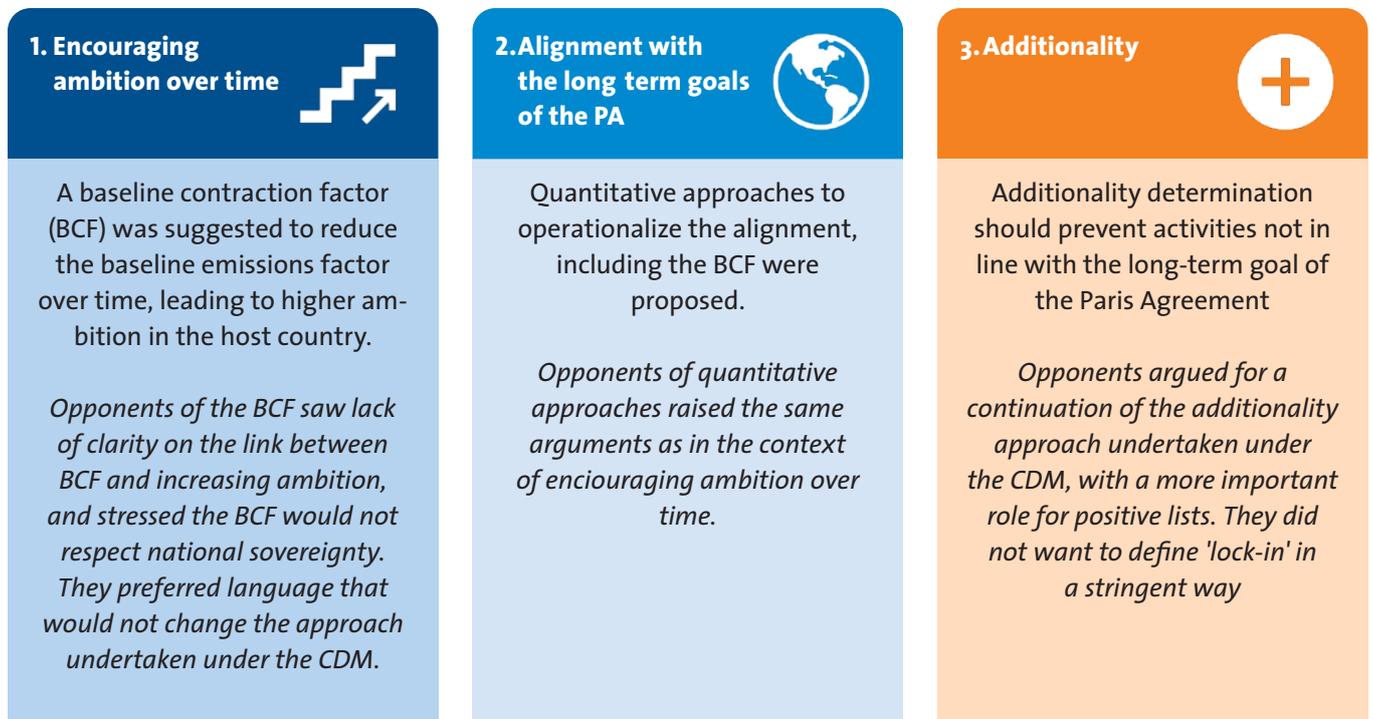
Unfortunately, the SB began its work late because it took until June 2022 for the regional groups to agree on their SB members. Therefore, in 2022, the SB met three times within just five months to develop recommendations for COP27 in November 2022.

Despite intense night-long discussions at its third meeting (SB003) to finalise its recommendations on methodologies for adoption at COP27, the SB was unable to agree on operationalisation options and just presented an information note (UNFCCC 2022b) at COP27. Old conflicts between host countries with many CDM activities, particularly emerging economies, arguing for loose baseline definition and lenient additionality determination and developed countries wanting to interpret the Glasgow decisions as stringently as possible broke out. The key points of contention are summarized in Figure 2 below.



Source: Giacomo Zucca/Bundesstadt Bonn

Figure 2: Key points of contention at SBoo3



Source: Authors

Thus, COP27 could only defer the topic to COP28. This will likely delay other methodologies-related processes under the A6.4M and mean that Article 6.4 activity developers must wait for another year to get more clarity.

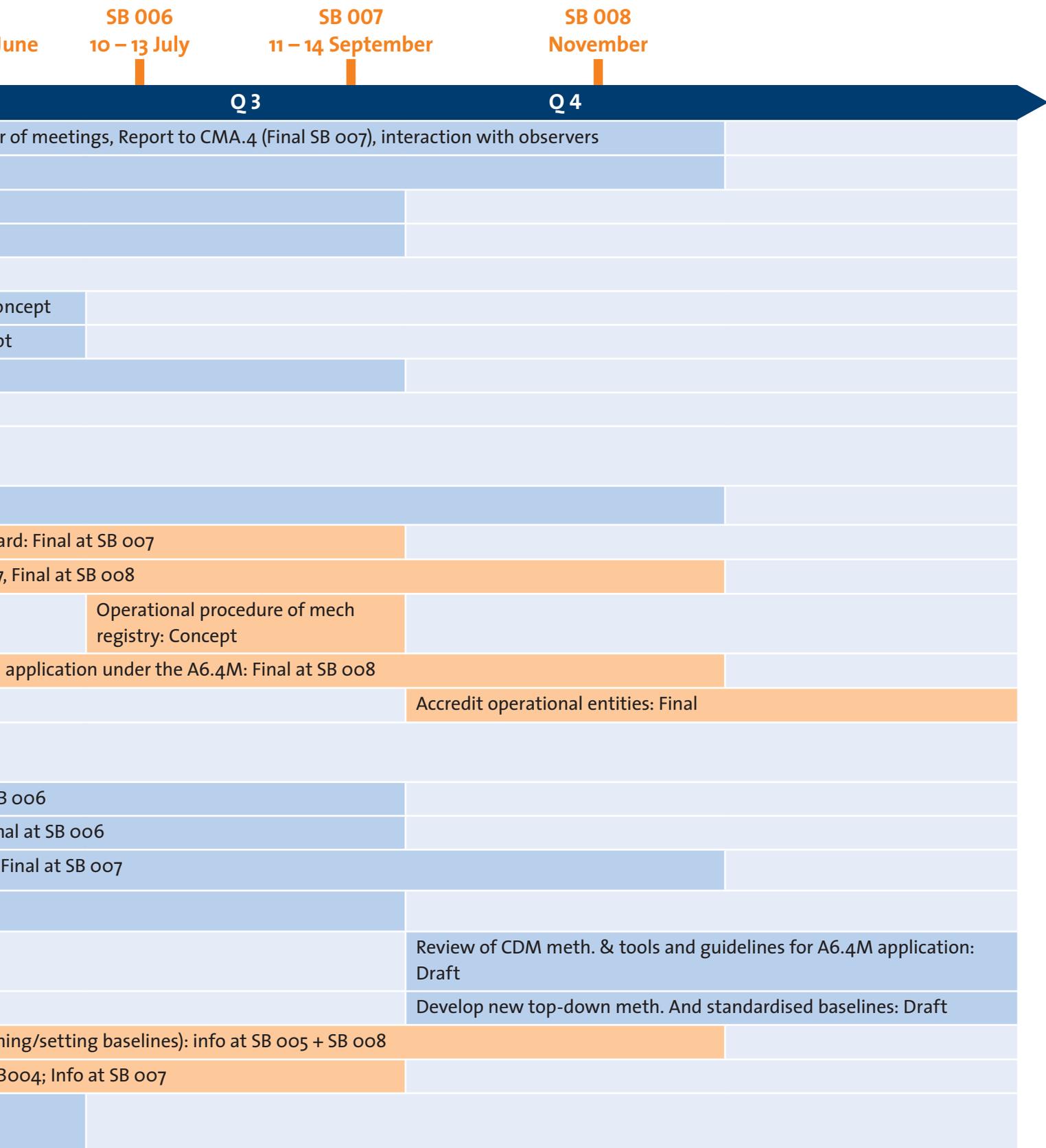
The SB is slated to meet five times in 2023 and must address not just the undelivered mandates from 2022 but many more mandates under the 2022–2023 workplan adopted by the SB at its second meeting in September 2022. At the first meeting of the SB in 2023 (SBoo4), the SB took stock of the mammoth task ahead of them this year and revised their workplan for 2023. This includes beginning work on the revision of CDM methodologies, tools and guide-

lines for application to the A6.4M from SBoo6 as well as development of new methodologies and standardised baselines from SBoo7 onwards (UNFCCC 2023). However, these mandates cannot be seriously addressed without an agreement on the underlying requirements. To this end, the SB aims to conclude its work on the application of methodological requirements by SBoo7 and on removal activities by SBoo6 (UNFCCC 2023). Therefore, it is critical for the SB to achieve significant progress on its pending mandates from 2022 by SBoo6 to deliver on the new 2023 mandates, otherwise the latter will have to be postponed to after COP28. Figure 3 below provides an overview of the latest draft workplan of the SB for 2023.

Figure 3: Draft workplan of the SB for 2023

		Q 1	Q 2
Governance	Supervisory Body	Organise SB meetings incl. (Vice) Chair selection (SB 004), calendar	
		Develop 2-year workplan: Final at SB 004; SB 005 – SB 008: Info	
		Carbon markets and carbon crediting standards: Concept	
		Special circumstances of LDCs & SIDS: Concept	
		Small and micro business: Concept	
			Engagement with LCCPI: Co
			Gender action plan: Concep
		Strategic plan and Communication plan: Final	
	Support structure	Decisions & Documents	
		Final: Selection of experts (based on ToR)	
Host countries	Facilitate DNAs: Information		
Activity cycle	Regulations		
Registry			
Accreditation			
	System	Review CDM accreditation standards and procedures for potential	
Methodologies	Process	Process for approval of meth work: Concept	
		Develop meth development procedure: Draft at SB 005; Final at SB	
		Develop standardised baseline dev. procedure: Draft at SB 005; Fir	
	Methodological requirements	Elaborate application of methodological requirements for CMA.5:	
		Regulation for removal activities for CMA.5: Final at SB 006	
CB	Programme design	Design of a CB programme (institutional arrangements and design)	
		CB programme (expediting implementation of A6.4: Concept at SB	
CDM transition	Process	Develop and operationalise a procedure for requesting transition (incl. relevant forms): Final at SB 006	

Source: Michaelowa et. al. (2022); UNFCCC (2023)

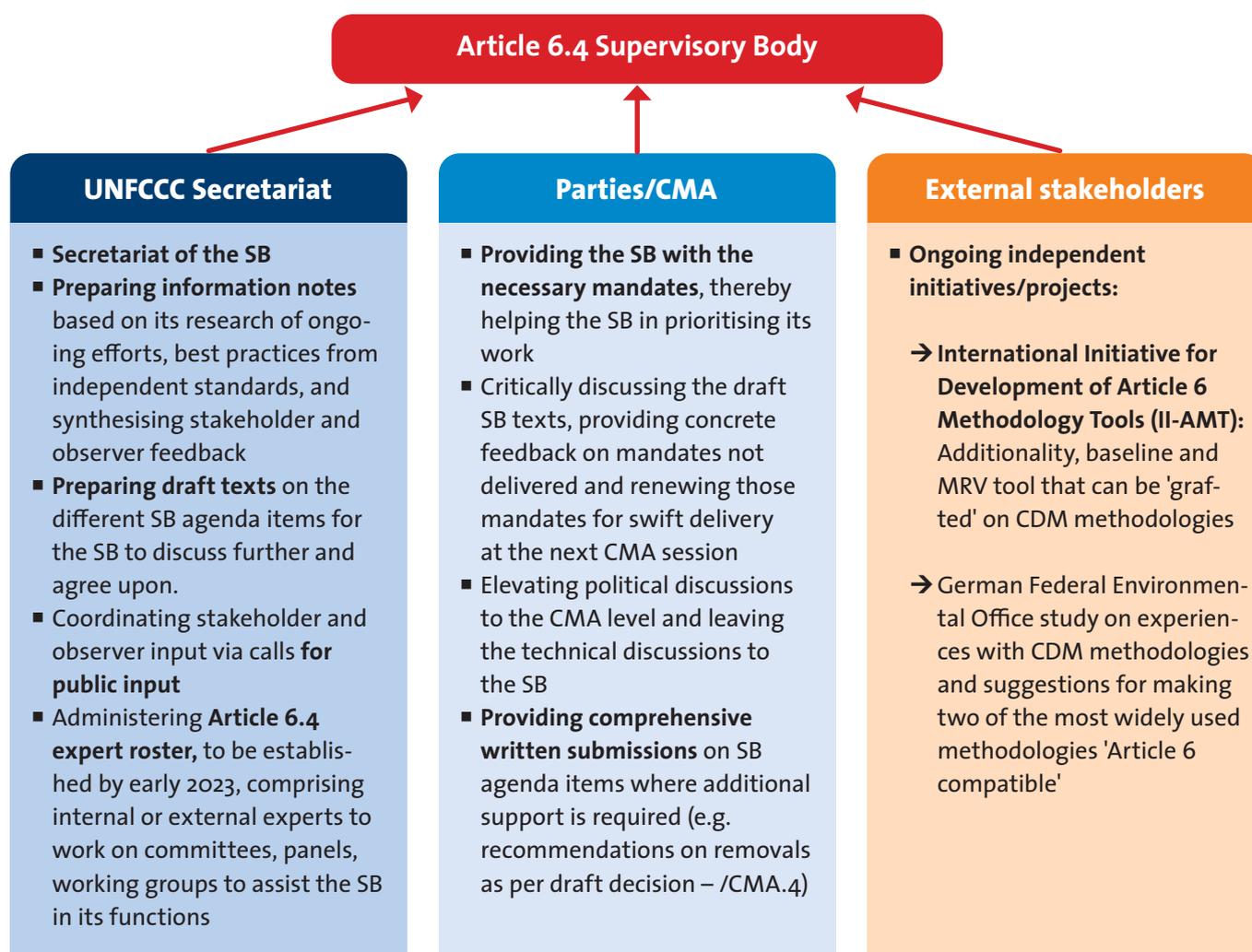


Can the methodology community help the SB to overcome the stalemate?

To tackle the herculean tasks ahead of the SB, it is crucial for relevant actors in the methodology community to support the SB in its work to operationalise A6.4M requirements and potentially transitioning existing (CDM) methodologies. In addition to the assistance from the UNFCCC secretariat and guidance from Parties,

the SB is setting up a support structure with external expertise in technical matters via a roster of experts and structured public consultation processes. Also, methodology-related work by independent initiatives is an important external resource that can accelerate the work of the SB by providing it with innovative approaches and ideas. Figure 4 below provides a detailed overview of the relevant actors and the support they can provide to the SB to overcome the impasse on the methodology agenda item.

Figure 4: SB support structure and methodology-related work



Source: Michaelowa et. al. (2022); UNFCCC (2023)

Ongoing efforts to facilitate the methodology transition process include the revision of PoA-relevant CDM methodologies for application in the A6.4M through the UNFCCC Secretariat funded by the International Climate Initiative (IKI) and Future of the Carbon Market Foundation, and the 'International Initiative for Development of Article 6 Methodology Tools' (II-AMT) run by Perspectives Climate Research and supported by the governments of Germany, Japan, Sweden, the UK and the African Development Bank. Especially the latter, which is not linked to international carbon market interest groups or particular positions in the SB debates, can help the SB overcome the deadlock in its methodology discussions. By bringing together well-seasoned methodology experts from all continents, it focuses on providing credible, unbiased recommendations for operationalising A6.4M methodological requirements. Given the currently raging debate on emerging scandals in the international voluntary carbon market, it is more important than ever that A6.4M methodologies are conservative and stringent in their approach to uphold the highest levels of environmental integrity.

Moreover, they need to be rapidly operationalised and tested in order to allow a rapid CDM transition and prevent a 'valley of death' for implementation of A6.4M activities.

In this context, II-AMT is developing a set of tools and guidance that can be added to existing baseline and monitoring methodologies in a modular fashion, thereby eliminating the need to develop Article 6 methodologies from scratch (II-AMT n.d.). This work needs to progress quickly as Article 6 pilot activities are already underway and approaches seen as inconsistent with the A6.4M methodological principles and requirements must be prevented from gaining ground. It will lay the groundwork for robust Article 6 methodologies and road-test the type of activities that will shape market-based cooperation as soon as possible. In the different tools under the initiative, the experts have taken a position on contested methodological aspects and made concrete proposals. We hope that this can help the SB to come to robust decisions that will allow the international carbon market under Article 6.4 to thrive in the long term.



Source: [gettyimages.de/chinaphotographer](https://www.gettyimages.de/chinaphotographer)

How does the independent Article 6 tools initiative address the crunch issues?

Following the conceptualisation phase finalised in early 2022, the development phase of the II-AMT, running until March 2023, provides concrete stepwise approaches to applying relevant Article 6.4 requirements to existing CDM methodologies. The development of the tools is undertaken through an inclusive and iterative process, building on exchanges with an advisory group bringing together governments and other stakeholders, and other technical experts engaged through a public consultation. Details of the proposed key elements of the Article 6 methodology tools, including the justification of the steps, are discussed below.

TOOL01 – Tool for the demonstration and assessment of additionality

The proposed additionality tool comprises six steps (II-AMT 2023a):

- 1. Passing an eligibility test** to ensure that the activity is in line with the long-term goals of the PA and does not lead to emissions lock-in. This includes providing evidence that the activity is not on any negative list and that it and its emissions scenario are in line with the host country's long-term low emission development strategy's (LT-LEDS) scenario, if available. While this test was not applied under the CDM, its inclusion here is based on the realisation that an emission intensity approach to baseline setting undermines the achievement of the PA's long-term goal.
- 2. Issuing a public notification of the intent to earn carbon credits** prior to the start of the activity, demonstrating that carbon market revenues were considered by the activity participants in the investment decision of

the activity. Unlike under the CDM, where such notification could be submitted within 6 months of the project start date, TOOL01 proposes that activity developers must clearly demonstrate before the activity starts (i.e., before any investment/commitment is made) that revenues from the sale of Article 6 credits were decisive to go ahead with the activity.

- 3. Determining regulatory additionality** to confirm that the activity is neither mandated by law nor is the mitigation it achieves required by regulation. This step also includes a check of whether existing and promulgated regulations would mandate the activity at any point during the crediting period.
- 4. Evaluating inherent financial additionality risks** relating to the activity type by analysing whether the only source of revenue or savings of the activity is the revenue from the sale of Article 6 credits. This evaluation will determine if an investment analysis is required, unlike under the CDM where the decision was left to the activity developer. If the consolidated inherent financial additionality risk is medium or high, then an investment analysis step is mandatory. In addition, the implementation risk of the activity type must be evaluated, wherein prevalent non-monetary barriers to activity implementation are evaluated. If this risk is medium or high, then implementation barriers must be incorporated into the investment analysis.
- 5. Determining the financial additionality of the activity** (if applicable) based on investment analysis and potentially limiting the crediting period if the activity is marginally unattractive, given that in such a case the incentive needed is not particularly large.
- 6. Reassessing regulatory additionality** at crediting period renewal.

TOOL02 – Tool for robust baseline setting

The following steps are proposed for robust baseline setting (II-AMT 2023b):

- 1. Selecting a baseline approach among the three eligible ones under Article 6.** For sectors with homogeneous characteristics of the production process, the tool prescribes a best available technology (BAT) approach if the necessary data is available. If not, then an ambitious benchmark approach should be selected. In case of a complex sector and a lack of data on the performance of technologies, the third baseline setting approach based on existing actual or historical emissions adjusted downwards should be chosen. This step embodies an implicit hierarchy of the BAT over the ambitious benchmark approach as BAT often results in more stringent baselines. The historical approach remains available for sectors where benchmarks would have to be highly disaggregated, and their choice would not be straightforward. This hierarchy builds on the experiences made under the CDM, where an attempt to generally apply benchmarking failed after 2010 due to the difference in sectoral characteristics.
- 2. Setting the baseline according to the selected approach:** For all baseline setting approaches, once the baseline is selected and set, a 'Paris goal coefficient' must be applied to ensure the baseline's alignment with the PA's long-term goal. The coefficient, similar to the concept of the Baseline Contraction Factor (BCF) discussed at SB003, declines linearly over time and reaches net-zero when the host country reaches its net-zero target. The application of the coefficient ensures that host countries do not have the incentive to keep their nationally determined contributions (NDCs) unambitious, as the coefficient is applied regardless of the NDC's actual ambition. TOOL02 proposes that the SB determines the coefficient as well as the net-zero target year for the respective country if undefined.
- 3. Comparing the stringency level of the NDC/sectoral reference against the activity-level crediting baseline** to consider whether the baseline must be adjusted downwards.
- 4. Regularly updating the baseline** at the beginning of each new NDC period.



Source: gettyimages.de/yangna

TOOL03 – Tool for monitoring, reporting, and verification (MRV)

The MRV tool highlights four key elements to be incorporated into the existing CDM MRV framework for it to be in line with Article 6 requirements (II-AMT 2023c):

1. Ensuring conservativeness:

There is a need to balance the principles of accuracy and conservativeness in MRV. Aiming to achieve the highest possible level of accuracy can be expensive for activity developers, while conservativeness can also be achieved through the use of low-accuracy defaults. TOOL03 proposes that activity developers should strive for the highest level of accuracy possible without incurring prohibitive costs. Where higher accuracy results in prohibitive costs, the activity developer can use a less accurate methodology if it ensures that emissions are overestimated, and removals are underestimated.

2. Monitoring of all relevant policies:

CDM was implemented in contexts where host countries had no mitigation targets. As a result, there was no requirement to align activities to host countries' national policies. This has changed with the NDCs and LT-LEDS under the PA. The Article 6.4 rules stipulate that activities must be compatible with the host country's NDC, LT-LEDS and/or the PA's long-term goals, while at the same time encouraging ambition over time. Therefore, it is essential for activity participants to monitor all relevant policies. TOOL03 provides a risk-informed approach for such monitoring.

3. Monitoring of reversals:

The CDM provides limited insights on identifying and addressing the risk of reversals. Temporary crediting approaches were used for projects with reversal risk, but there was limited practical implementation. Most of the reversal-related methodological work and practical experience has occurred under voluntary carbon market standards. TOOL03 applies best practices from these standards and specifies a monitoring approach for activities with high reversal risk, including provisions for monitoring beyond the activity's crediting period.

4. Monitoring of Sustainable Development (SD) impacts:

Given a strong political mandate to track positive and negative SD impacts under Article 6, there is a need to revisit the CDM SD tool and fill the gaps identified to design a robust SD assessment system under Article 6. TOOL03 recommends the use of the SD tool which is currently under development by the SB. Moreover, it provides a Safeguards Tool, which specifies a minimum threshold that a mitigation activity must adhere to abide by the 'do-no-harm' principles. A framework for assessing the environmental, economic, and social impacts of the proposed activity is also included.

Outlook for the Piloting Phase of the II-AMT

Building on the conceptual and development phases of the initiative, the II-AMT will proceed into its piloting phase in April 2023, wherein suitable pilot activities under Article 6.2 will be identified to test the three aforementioned tools. The identification of suitable pilot activities will focus on the ongoing efforts in the context of Article 6.2 bi- or multilateral pilots that specifically seek compliance with the Article 6.4 methodological requirements.

The goal of the piloting exercise is to understand the ease of application of the respective tool to the underlying mitigation activity, the limitations, the need for sector/activity-specific adjustment(s) and overall transaction costs.

Based on the outcome of piloting tests, the tools will be revised as needed. Lessons learned in the process will be shared publicly with the broader expert community. Eventually, II-AMT aims to submit the revised Article 6 methodology tools to the SB for approval and use by Article 6.4 activities.

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Industrial N₂O: Mapping the potentials

Mitigation potentials for emissions of nitrous oxide from chemical industry in industrialised countries worldwide

by Wolfram Jörß, Sylvie Ludig, Lambert Schneider (Öko-Institut), Enrico Rubertus, Emilio Martin, Volker Schmidt (GIZ-NACAG)

A new study on behalf of BMWK investigates mitigation potentials in industrialised countries for emissions of the greenhouse gas nitrous oxide (N₂O) from chemical industry, in particular from the production processes for nitric acid, adipic acid and caprolactam. The study was conducted by Öko-Institut for the Nitric Acid Climate Action Group (NACAG), implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of BMWK.

The study report presents 15 country briefs covering the size of the respective industries, current regulatory framework conditions affecting N₂O

emissions, N₂O abatement in place, and estimates of current N₂O emissions, emission intensities and mitigation potentials. The covered countries and regions are Australia, Canada, Chile, the European Union, Israel, Japan, the Republic of Korea, Norway, Russia, Saudi-Arabia, Singapore, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States of America but do not include 'emerging economies' like China or India. For the purpose of the study, 'industrialised countries' are defined as countries not identified by the OECD as eligible for official development assistance (ODA).

Industrial N₂O

Industrial nitrous oxide emissions are caused by three main sources: the production of nitric acid, adipic acid and caprolactam. All three substances produce nitrous oxide (N₂O) through the oxidation of nitrogen compounds during the production process. Nitric acid is an important component of artificial fertilizers, while adipic acid and caprolactam are important plastic precursors. They are used as polyamides in the form of synthetic fibers in the textile, medical and machinery industries.

Table 1: Present and / or historic production activities in the countries covered by the analysis

	Nitric acid	Adipic acid	Caprolactam
Australia	✓		
Canada	✓	✓	
Chile	✓		
European Union (1), (2), (3)	✓ 1)	✓ 2)	✓ 3)
Israel	✓		
Japan	✓	✓	✓
Republic of Korea	✓	✓	✓
Norway	✓		
Russia	✓		✓
Saudi-Arabia	✓		
Singapore	✓	✓	
Trinidad and Tobago	✓		
United Arab Emirates	✓ ?)		
United Kingdom	✓		
United States of America	✓	✓	✓

1) EU Member states with present nitric acid production: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden

2) EU Member states with present adipic acid production: France, Germany, Italy

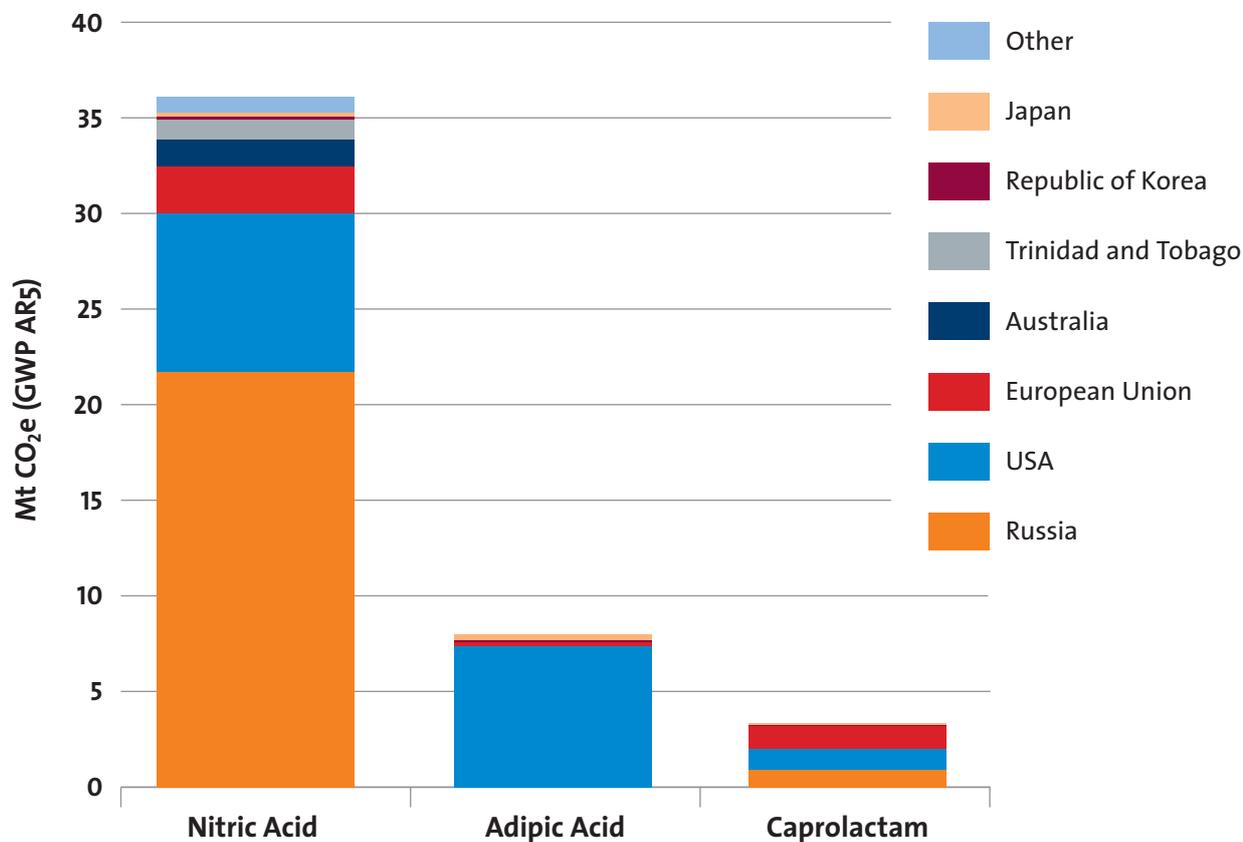
3) EU Member states with present caprolactam production: Belgium, Czech Republic, Germany, Netherlands, Poland, Spain

Please note: The geographic scope of the study covers industrialised countries world-wide where nitric acid production, adipic acid production and/or caprolactam production takes place. For the purpose of this study, 'industrialised countries' are the countries not identified by the OECD as eligible for official development assistance (ODA). Based on that criterion, the list of covered countries as spelled out in the table below does not include 'emerging economies' like China, India, South Africa, Mexico or Brazil.

In total, 2020 process emissions of N₂O from chemical industry in industrialised countries worldwide are estimated at 47.4 Mt CO₂e in total (GWP AR5), thereof 76 % (36.1 Mt CO₂e) from nitric acid production, 17 % (8.0 Mt CO₂e) from adipic acid production and 7 % (3.3 Mt CO₂e) from caprolactam production.

The investigated countries and regions contributing most to N₂O emissions are Russia, the USA, the EU, Australia and Trinidad and Tobago for nitric acid production, the USA for adipic acid production, and the EU, the USA and Russia for caprolactam production.

Figure 1: N₂O process emissions 2020 from chemical industry in industrialised countries



Note: 'Other' countries: Canada, Chile, Israel, Norway, Saudi Arabia, Singapore, United Arab Emirates, United Kingdom

Source: own representation of study results

Climate policies affecting N₂O emissions from chemical industry for the key contributors are missing in particular for Russia, the USA and Trinidad and Tobago. The European Union, while covering N₂O from nitric and adipic acid production under the EU-ETS, employs no policies effectively addressing N₂O emissions from caprolactam production.

For **nitric acid production**, average emission intensities per country range from very high 8–9 kg N₂O/t HNO₃ (Trinidad and Tobago, Russia) to low 0.5 kg/t and less for Western European countries and Korea. While a comparison of national average emission intensities provides a benchmark-based top-down indication of N₂O mitigation potentials for ambitious climate policies, 'low-hanging fruit' mitigation potentials in presently unabated nitric acid plants were additionally estimated: These sum up to 63 % of total N₂O emissions from nitric acid production estimated for 2020 (22.5 Mt CO₂e mitigation

potential out of 36.1 Mt CO₂e 2020 emissions). Such mitigation potentials are primarily allocated to Russia, the USA and Trinidad & Tobago. Single further nitric acid plants without abatement were identified for Australia and Japan. For Australia, however, a retrofit is reported to be underway.

Adipic acid production is taking place in only six of the industrialised countries studied, i.e. the USA, Japan, Korea and the EU Member States France, Germany and Italy. Emission intensities range from very high 40 kg N₂O/t adipic acid (USA) to as low as 2–4 kg/t and below for the EU and Korea. While ambitious mitigation is taking place in Japan, Korea and the EU, the mitigation efforts in the USA are insufficient, as available mitigation equipment appears to be operated poorly.

Caprolactam production is taking place in 10 of the industrialised countries studied, i.e. the USA, Russia, Japan, Korea and the six EU Member States Belgium, Czechia, Germany, France, Germany, Netherlands, Poland and Spain. Emission intensities range from very high 9 kg N₂O/t caprolactam (USA and Russia) to as low as 2 kg/t for Japan and Korea. Even lower emission rates were reported for EU Member States Poland (0.6 kg N₂O/t) and Germany (nearly complete elimination). While ambitious mitigation is taking place in Japan, Korea and some EU Member States, the mitigation efforts are insufficient in the USA, Russia and other EU countries. Unlike nitric acid and adipic acid production, N₂O emissions from caprolactam production are not covered by the EU-ETS.

Further information

The full study can be downloaded at <https://www.oeko.de/fileadmin/oekodoc/NACAG-N2O-mitigation-potentials.pdf>



Source: gettyimages.de/RYosha



Innovate4Climate goes Bilbao

This year's I4C, the annual global conference on climate finance, climate investment and climate markets, will take place as an in-person event again, from May 23-25, 2023 at the Bilbao Exhibition Centre. Register at <https://www.innovate4climate.com>

Regional Climate Weeks: save the dates

Africa Climate Week, Nairobi, 4-8 September.
Middle East and North Africa Climate Week, Riyadh, 9-12 October.
Latin America and Caribbean Climate Week, Panama City, 23-27 October.
Asia-Pacific Climate Week, tba.
Find out more at <https://unfccc.int/climate-action/regional-climate-weeks>

Glossary

All Carbon Market terms and abbreviations are explained in detail in our online glossary. View it here: www.carbon-mechanisms.de/en/glossary