

CARBON MECHANISMS REVIEW

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An outlook on the Article 6 negotiations

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editorial

Bula, willkommen and hello!

It's COP time again, this year in the extraordinary constellation of Fiji holding the presidency while the conference takes place in Bonn, Germany, hosted by the UNFCCC secretariat. With Fiji presiding over the annual climate change conferences, the vulnerability of small island developing states in the Pacific and elsewhere and the need to finance both adaptation and mitigation actions, including insurance is put centre stage. As for the negotiation dramaturgy, Fiji is going to add Talanoa to the consultation formats, a Pacific concept of informal storytelling building empathy and consensus for collective action.

In terms of the Article 6 talks, seeking consensus is the order of the day. In order to meet the goal of adopting the so-called Paris rulebook at next year's COP in Poland, at or after the Bonn conference draft negotiation text has to be produced. However, while the intersessional meeting in Bonn this summer led to a better understanding of Parties' positions, formal progress in the Article 6 negotiations is still lacking. Please see the adjacent analysis for further details. It is focusing mainly on Article 6.4, as this is where the development of rules, modalities and procedures are to be developed as the most comprehensive product of the Article 6 negotiations, but it also touches on the bigger picture in respect of Article 6 overall.

This view is complemented by a synopsis of Parties' submissions related to the Article 6 talks, which were handed in right before the conference. Further articles include an analysis of the new context for the additionality requirement of cooperative action, a report on using Article 6 to support the global energy transition, and a presentation of the climate ledger initiative, which aims at making use of blockchain technology in climate action.

On behalf of the editorial team, I wish you an informative read and a successful COP23!

Christof Arens



Wuppertal Institut

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Quo vadis SDM?

What to expect from the Article 6.4 negotiations

by Sandra Greiner, Climatefocus

Half way through the negotiation time for the Paris rulebook, nothing tangible has emerged as yet on the design of the new mechanism for mitigation and sustainable development, also referred to as the Sustainable Development Mechanism (SDM). The only authoritative source remains the text of its founding Articles 6.4-6.7 of the Paris Agreement as well as associated paragraphs 38 and 39 of the Paris Decision. This is also true for the cooperative approaches and the framework for non-market based approaches, given that all three approaches under Article 6 are purposefully progressed (or not) in unison. During the intersessional negotiations in Bonn earlier this year, many Parties were adamant not to give an official status to the co-chairs' summary documents capturing the discussions during SBSTA 46. Some considered the output of the discussions on Article 6 "no progress at all" for introducing ideas that in their view have no hook in the Paris Agreement and hence no legitimacy. The informal information notes published as a result of SBSTA 46 therefore carry an oversized disclaimer that they must not be mistaken as basis for the negotiations or pre-judge the way forward in any way.

Notwithstanding the lack of formal progress on any of the Article 6 approaches and many negotiation hours lost on procedural discussions, it is fair to say that Parties' understanding of Article 6 has improved significantly since Paris. The many hours in which negotiators have explained their views and interpretations of the text to each other have certainly sharpened the proposals that Parties are making in their most recent submissions, as well as raised awareness

of each other's trigger points. It is increasingly clear which issues are most neuralgic in the negotiations. However, it remains to be seen whether this progress in understanding will also translate into the emergence of actual negotiating text during or after COP 23. This clearly is required for meeting the overall progress expectations of COP 23. When heads of delegations recently met in Rabat for a preparatory meeting, they indicated a desire to move beyond technical discussions, capture interim progress at COP 23 and mandate the chairs and co-chairs of the various negotiation streams to prepare draft texts, at the latest in the first half of 2018.

What do Parties need to agree on and by when?

The ultimate task required of Parties by COP 24 next year is to adopt the rules, modalities and procedures (RMP) of the new mechanism, which is the mandate from the Paris Decision. As a first step towards this task, Parties have set themselves the goal of defining and operationalizing the elements of the RMP. The wording first emerged in the call for submissions from SBSTA 45 in Marrakech, and has been carried forward to the most recent call for submissions from SBSTA 46. Lacking a definition, however, it is not entirely clear what the term signifies. For example, elements could be synonymous with political issues to be resolved, or they could stand for the headings of the RMP. The EU has introduced an additional layer by referring to "core elements", meaning elements that have to be agreed as part of the Paris rulebook while



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Moving the talks forward: incoming and outgoing COP presidencies at a preparatory meeting.

those of secondary technical nature could be operationalized later. This carries the implicit concession that Parties will not be able to fully operationalize the new mechanism by 2018. While this is probably a fair expectation, considering where negotiations have reached so far, it does bear the question of how the Paris Rulebook or, as it has recently come to be known, the “Paris Agreement Implementation Guidelines” would look like. One might implicitly have assumed the RMP of the SDM to somehow resemble the modalities and procedures of the CDM adopted through the Marrakech Accords. It is entirely possible, however, that a less detailed agreement on the “core elements” could be struck at Katowice next year and that further work programmes would be set up for the elaboration of operational details. Note the positive outlook of this article that assumes a deal will be struck in spite of many highly divergent views and technical complexities still remaining.

It is interesting to observe that some Parties dispute the very notion that political decisions need to be reached. New Zealand and other members of the Umbrella Group are of the view that the Paris Agreement represents a carefully struck political compromise that leaves Parties with only the technical task of executing the political decisions. Any renegotiations of issues dismissed in Paris would be in bad faith. Without discussing here what is political and what is technical, it is a fact, however, that countries widely disagree on some of the design features of the new mechanism. How these differ and where the main negotiation lines can be perceived is discussed below.

The good, the bad and the ugly

An area where Parties may not be too far apart is their understanding of the scope of the RMP, i.e.

which issues are to be addressed through CMA rule-making. Given the experience with the Kyoto mechanisms and many items specifically mentioned in Article 6.4 and paragraph 38 already, a number of issues can be seen as relatively uncontroversial. If one were to elaborate the headings of the RMP, things like definitions, participation requirements, scope of activities, activity cycle, GHG accounting, governance, share of proceeds, and tracking infrastructure would in some formulation or other be likely elements of the RMP. Of course, that does not mean that Parties would agree on the substance of the ruling. The trickier aspect of defining the scope of the RMP consists of limiting the issues to those agreed to by all. This already became apparent during SBSTA 46, when Parties vehemently opposed any of their issues being taken off the list of possible elements, resulting in inclusive but far-reaching informal information notes. Credits are due to the co-chairs and the Secretariat for concisely packaging issues and preventing the notes from expanding further.

Another area of relative harmony may be the participation and eligibility requirements of the mechanism. According to the Paris Agreement, all Parties are allowed to participate in mitigation activities under 6.4 and so far there has not been a strong impetus for placing further restrictions on Party participation. In terms of eligible mitigation activities, it is a widely shared understanding that projects and Programmes of Activities as known under the CDM would be among the eligible categories. This is not to say that Parties would also agree to transitioning existing projects and PoAs to Article 6.4, which is an entirely different and less harmonious question (see below). Whether other types of activities such as “broader approaches” would also be eligible, or the mechanism could even vet GHG protocols outside the UNFCCC as suggested by AILAC remains uncertain, mainly because it is insufficiently understood how this would work. This also includes the question how the mechanism could play a role in supporting wider carbon pricing approaches including sectoral regimes and policies in developing countries. Both New Zealand and African countries suggest to stage

the development of the RMP and start with categories for which sufficient experience already exists, while providing the flexibility to add categories later. The previously debated inclusion of activities under REDD+ has been fading from the discussion under Article 6.4 and mainly become a topic under the cooperative approaches of Article 6.2.

Then there are areas where Parties can build on former rules but have already indicated a strong and sometimes controversial desire for reform. This is the case for the role and composition of the Supervisory Board of the new mechanism, which many Parties wish to design differently from the CDM Executive Board: having a different representation of country groups, stressing technical expertise of members, improving gender balance, strengthening the supervisory role or even changing voting rules to a supermajority (New Zealand). Speaking of governance, design of the new mechanism also revives the age-old discussion of the need for an appeals or grievance mechanism. Finally, there are considerations of strengthening the role of the DNAs in light of possibly greater requirements on both the host and the acquiring Parties.

This leaves the highly contentious issues. Unsurprisingly, many have to do with the transition from the Kyoto Protocol to the Paris Agreement, which requires new rule-making and analysis. Listening to Parties’ interventions in Bonn this summer, the following areas have seen clearly diverging views.

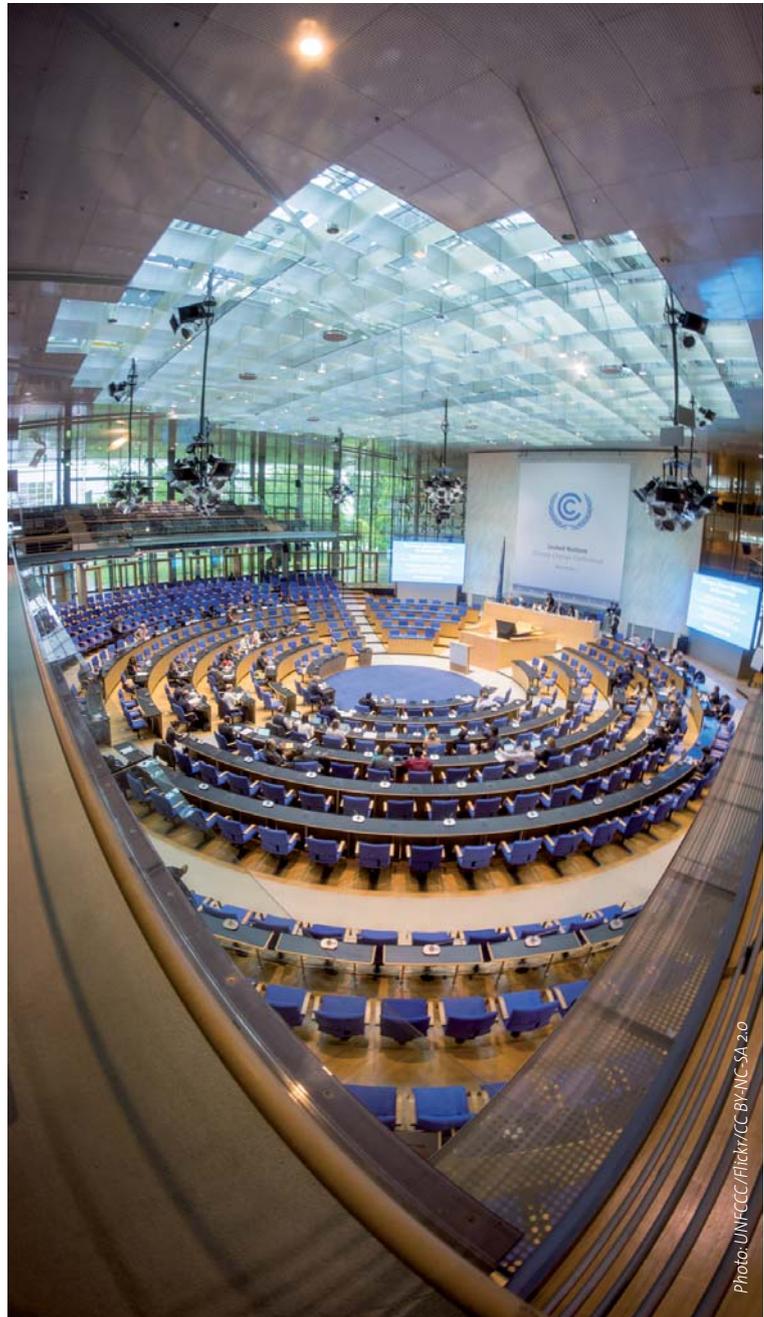
Mitigation activities outside the NDCs

A debate has unfolded whether countries should be able to use the mechanism for mitigation activities in sectors covered by their NDCs only, or also for activities outside of their NDCs. The EU takes a restrictive stand, arguing that only activities inside the NDCs should be credited, noting that Parties can update their NDC at any time. The main motivation is to uphold incentives for NDC progression. Japan does not want to exclude activities from outside the

scope, but requires that credits generated from the 6.4 mechanism should be subject to corresponding adjustments in line with the guidance of Article 6.2 in order to avoid double counting. African countries argue to allow mitigation activities from all sectors, considering the mitigation potential in sectors outside scope. If a country has not included a sector under its NDC, it is mostly because of the lack of quality data. Allowing mitigation activities from outside scope could generate better data and capacity in the sector and thereby enable NDC progression over time. African countries also argue that corresponding adjustments should only apply in cases where units from the mechanism are used for compliance purposes but not if they are cancelled – for example, against the disbursement of climate finance. This is because in such cases there would not be any risk of double counting the emission reductions against more than one Party's NDC. Brazil fully rejects the application of Article 6.2 guidance to the host country. In the Brazilian view, requiring corresponding adjustments on the part of the host country would serve as a disincentive for Parties to approve SDM mitigation activities in their territory, thus undermining the mechanism's potential to deliver real, measurable, and long-term benefits related to additional emission reductions.

Crediting and NDCs

The most technically challenging area is the question of how crediting approaches should account for the fact that host Parties have taken on commitments on their own through the NDCs. In addition, approaches under Article 6 should further enhance ambition. How this could be translated into crediting approaches is not yet well understood. The EU has a full catalogue of requirements including for the scope and nature of credited activities to be in line with domestic policies and priorities, the use of ambitious benchmarks that reflect best available technology, crediting approaches to ensure permanence and avoid technological lock-in and crediting periods to be aligned with the timeline of NDCs to avoid disincentives for ambition and progression.



Facilitating dialogue: Chamber Hall at the World Conference Centre Bonn.

Brazil, on the other hand, believes that the proper operationalization of the additionality concept sufficiently addresses the changes brought about by the NDCs. According to Brazil, with the progressive implementation of the Paris Agreement and policies

undertaken in the context of a Party's NDC, activities that were once deemed additional might not be able to demonstrate any longer that they are the first-of-its-kind or that they pass the investment, barriers and common practice analysis. Hence, the existing CDM methodologies and the additionality tool are well equipped to serve the context of the Paris Agreement. This debate is clearly reminiscent of the intense but inconclusive discussions of the reform of crediting approaches under the CDM.

Article 6.4 specifically also requires an overall mitigation of global emissions. While this in itself is a breakthrough political compromise from Paris, how to operationalize the concept is still good for some controversy. Japan mainly advocates for conservative reference scenarios compared to baseline approaches used under the CDM while AOSIS favours the cancellation of credits to ensure they are not counted towards any Party's NDC.

The meaning of sustainable development

At the onset not much dispute seems to exist around the topic considering the widely shared notion that sustainable development is a national prerogative. This is not to say, however, that all Parties are prepared to follow the model of the CDM and again delegate the sole decision-making power to the DNAs of the host countries. Parties such as the EIG insist that activities under the mechanism will also have to be evaluated on the grounds of their contribution to the global SDGs and adhere to minimum safeguards to mitigate the risk of negative impacts, both environmental and social ones. Citing lessons learned with the CDM, the main concerns are the lack of transparent criteria applied by host countries when evaluating the contribution to sustainable development, no ongoing monitoring and reporting on these effects, as well as, most sensitively, allegations of human rights violations in connection with registered CDM projects.

Other groups including the LMDCs and Arab group also stress the major significance of sustainable development or even recognize it as the primary goal of Article 6, however doing so from a different vantage point. Saudi Arabia, as influential member of both groups, links the concept to the preservation of national prerogatives and the avoidance of negative social and economic consequences, including in countries that do not form part of a specific Article 6 transaction. It detrimentally opposes the notion of global standards for sustainable development. The nationally determined character of sustainable development would provide the opportunity for recognizing two relevant areas under Article 6: mitigation co-benefits resulting from adaptation actions, including economic diversification (Article 4.7) as well as the avoidance of emissions, in the case of growing economies.

CDM Transition

Finally, Parties are split on what to do with activities already registered under the CDM and credits already issued but not used during the Kyoto Protocol's second commitment period. Brazil sees the SDM as a direct predecessor to the CDM and calls for a smooth transition from one mechanism to another. This includes the transition of issued credits, registered projects, CDM methodologies and the accreditation system. African countries are particularly concerned with a transition pathway for PoAs with high sustainable development benefits, calling for activities in countries that have benefitted the least from carbon markets to receive special consideration. Transition of projects and PoAs should follow an eligibility check based on a set of criteria, which would allow these activities to transition without having to undergo re-validation.

The EU finds the discussion of transitional issues at this point untimely and argues that it should only occur after the core elements of Article 6.4 have been agreed. Once this is the case, existing or ongoing activities should be re-assessed in accordance with the rules of Article 6.4, in particular in relation to

additionality and baselines. New Zealand recognizes the concern for transition of CDM activities by Parties but agrees with the need for their re-assessment against Article 6.4 rules. While sometimes also JI transition is brought into the debate, the situation for JI is less critical because the mechanism has not issued credits during the second commitment period of the Kyoto Protocol and does not have a recent pipeline in limbo.

How to move beyond the dividing lines?

Dealing with both the multitude of topics as well as these clearly controversial issues will be a challenge at COP 23. On top of the difficult substance negotiations comes the procedural question of how to advance negotiations beyond an exchange of views and move towards the production of negotiation text. This article closes with some thoughts on how progress could hopefully be achieved:

- A natural place for the negotiations to start is with the overall structure of the RMP. This effort is already underway. The informal information notes were the first attempt at defining the building blocks of the RMP and a number of Parties have made structural proposals in their submissions. Consolidating the various proposals into an agreed version seems like a primary and achievable task. However, there are some real pitfalls, which hopefully can be avoided. One is that Parties would get distracted by discussing the place or phrasing of the elements. An even greater danger lies in Parties becoming bogged down again in the debate of whether elements have a hook in the Paris Agreement or not.
- The next frontier would then be to crystallize high-level options under the main headings. This has not yet started, but as the analysis above shows many options are already distinguishable. It would be a true accomplishment if SBSTA 47 managed to adopt an initial structure of the RMP with options (certainly with the caveat that

further elements and options can be added or remain in brackets).

- The elements under discussion clearly differ in political priority and technical complexity. In order to accomplish the task of adopting the RMP at COP 24, sufficient attention must be given to the more complicated issues. This could be through spin-off groups in the negotiations or dedicated calls for submissions, workshops and technical papers. Additionally, the roundtable format is already suitably used for the discussion of crunch issues. Deeper discussion is particularly relevant for those issues, which are not just political but also have technical repercussions. This can be said for the issues of NDC and crediting, CDM transition and the structure and role of the supervisory board.
- This author also believes that the discussion on CDM transition must be resolved by 2018, as part of the Paris rulebook. For one, discussing the fate of registered projects is an issue where timing makes a material difference on how many emission reductions will be achieved. Secondly, addressing the topic in parallel with the development of the rules will inform and sharpen the debate and enable negotiators to reflect on issues in greater depth. Practical examples should inform the rule-making and not be an afterthought. It would be beneficial to already think through which additional requirements registered CDM activities would have to meet in order to be recognized under the SDM, and how the approval process could work. Time would be wasted if this debate only started after 2018.

Wanted: the Common Denominator

An analysis of the recent round of submissions on Article 6 of the Paris Agreement

by Wolfgang Obergassel and Christof Arens

A useful means in the concert of UNFCCC negotiation styles is to invite Parties to submit their views on controversial agenda items in written form between the sessions. It is currently frequently applied in the workstream on cooperative approaches under Article 6 of the Paris Agreement: at the intersessional meeting in Bonn this summer, it was decided that Parties submit their input on selected aspects of the negotiations shortly before COP 23, taking place in Bonn in early November. This article summarises the views submitted in October 2017 to identify points of controversy and convergence.

How to comply with the Raising Ambition and Promoting Environmental Integrity requirements?

While the Paris Agreement mandates that Art. 6 should contribute to increasing climate ambition and promote environmental integrity, many submissions do not discuss these issues in detail. Those that do exhibit a wide divergence of views, with calls for ambitious action on the one hand and calls to have only minimum requirements on the other.

The African Group of Negotiators (AGN), the EU and New Zealand put it into the context of environmental integrity.

The AGN considers it imperative that cooperative approaches result in an increase of ambition. Mitigation outcomes can in their view only be traded if the cooperation has resulted in a greater level of mitigation than would have occurred in the absence of the cooperation. Parties involved must in their view demonstrate how they safeguard environmental integrity and sustainable development; this reporting would be subject to expert review, and Parties would only be allowed to use ITMOs towards their NDCs in case of positive expert reviews.

Canada similarly suggests that environmental integrity means that the generation and use of ITMOs must reduce overall global emissions.

The EU and New Zealand posit that environmental integrity needs to be related to the Agreement's more general principles, in particular the long-term goal, the progression of NDCs over time, and the requirements that NDCs should reflect the highest possible ambition and move over time towards economy-wide emission reductions. New Zealand further specifies that long crediting periods or crediting against BAU are not compatible with the Agreement's requirements.

The Arab Group and the LMDCs have a diametrically opposite position. They declare that the special character of Art. 6.2 lies not in the production of mitigation outcomes, which is also addressed in other parts

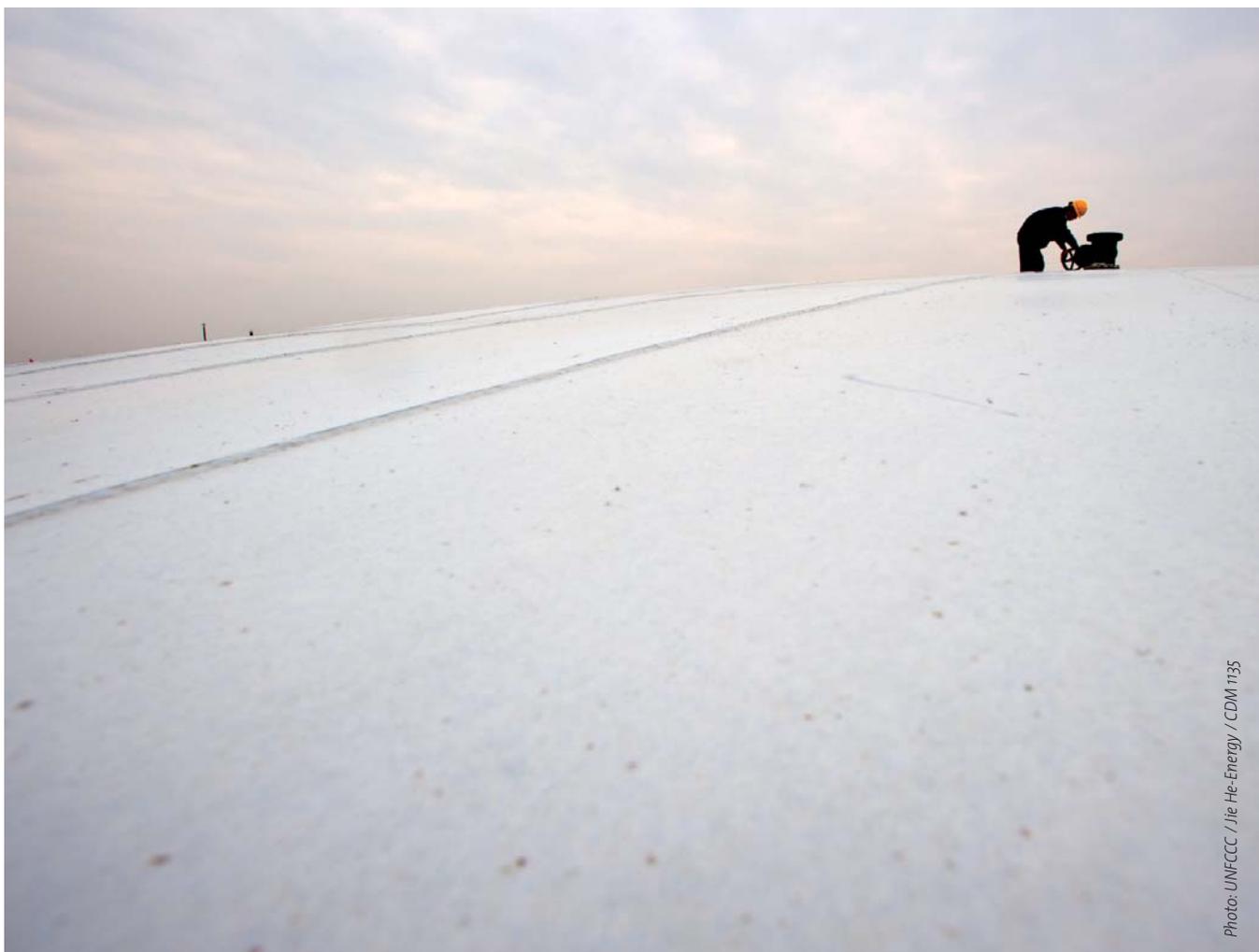


Photo: UNFCCC / Jie He-Energy / CDM 1135

Checking the meters: ensuring environmental integrity is key.

of the Agreement, but rather in their transfer. For this reason, environmental integrity should in their view be related to the transfer of mitigation outcomes while the mitigation outcomes themselves are the prerogative of Parties.

Thailand similarly wants to establish only minimum criteria on environmental integrity. No discount or exchange rates or similar approaches should be introduced.

How to promote Sustainable Development?

The submissions that are so far available seem to indicate that the controversy on whether or not to have international provisions on sustainable development may be over. Most submissions that discuss sustainable development agree that the definition of sustainable development and the determination whether activities contribute to sustainable development is a national prerogative. At the same time, most submissions suggest that Parties should be required to report on how their use of Article 6 is promoting sustainable

development. The EU is the most specific on this issue, suggesting comparable reporting on the basis of the Sustainable Development Goals. A number of submissions also suggest that an international tool like the CDM sustainable development tool could be helpful to assess activities in a comparable manner, with use on a voluntary basis.

The EU and Tuvalu also discuss human rights in this context. The EU suggests that host Parties should confirm that activities are in conformity with their respective obligations on human rights, while Tuvalu proposes that all units traded under Articles 6.2 and 6.4 would need to include a certificate indicating that the units traded or received have not resulted in environmental harm and have not adversely affected any human rights.

Which way for appropriately accounting for emissions?

Many submissions call for regular ongoing reporting and accounting to take place in the context of the broader accounting under Article 4.13 and the transparency framework under Article 13.

Most submissions maintain that Article 6 should have an inclusive approach, allowing participation of all countries irrespective of the types of their NDCs. However, Tuvalu posits that only Parties to the Paris Agreement that have quantified their NDCs should be eligible to trade emissions under Article 6.2 and to host activities under Article 6.4.

There is controversy on whether there is a need for corresponding adjustments if mitigation actions take place outside the host country's NDC boundary. Japan stipulates that the Art. 6.2 guidance should ensure incentives for Parties to increase the coverage of sectors under their NDCs. They therefore suggest that irrespective of whether credits are transferred or generated inside or outside a Party's NDC coverage, they should in both cases be added to its emissions or deducted from its removals. By contrast, the AGN holds that corresponding adjustments would not

apply if emission reductions are outside the scope of the transferring country's NDC, or if units are cancelled instead of being used for NDC compliance. In their view, the main reason why a sector is not included in an NDC is usually lack of quality data. Instead of penalising such sectors, Article 6 should in their view be used to improve data availability and thereby prepare integration in future NDCs.

Brazil continues to maintain the view that corresponding adjustment is only applicable in the context of Art. 6.2 and in the case of one Party transferring acquired Art. 6.4 units to another Party, but not to the initial forwarding from the Art. 6.4 registry to the 6.2 multilateral registry.

Which scope and what governance for Cooperative Approaches?

Consensus on what cooperative approaches are continues to be elusive. Many submissions hold that cooperative approaches should include any kind of cooperation between two or more countries. By contrast, Brazil's submission is not explicit on the issue, but the table of contents it proposes for the Art. 6.2 guidance suggests that it continues to see Art. 6.2 as analogous to Art. 17 of the Kyoto Protocol. The AGN similarly suggests that cooperation could take many shapes, but ITMOs are in their view a bookkeeping unit reflecting the net balance of trades and do not constitute carbon credits or a type of commodity. They posit that ITMOs are neither issued, nor can they be held, traded, cancelled, banked, or be used by private entities to fulfil commitments. Tuvalu similarly holds that use of cooperative approaches should be limited to trading emission reductions that are in excess of a Party's NDC. Units can in their view not be sold to other Parties after the first transaction, nor be traded in secondary markets.

Most of the submissions that are available so far are in favour of limited international oversight.



Photo: © KFW Bildarchiv / ausibser fotografie

Projects? Programmes? Sectors? The types of activities the Article 6.4 mechanism should cover is subject to debate.

What types of activities under the Art. 6.4 mechanism?

In contrast to the Kyoto Protocol, the Paris Agreement does not specify that the new “sustainable development mechanism” is about “projects”, raising the question of the level of aggregation of activities (projects, programmes and/or sectors). Most submissions suggest that the new mechanism should include all types of mitigation activities at all scales. By contrast, Brazil continues to maintain the view that the new mechanism should be similar to the CDM.

The AGN and New Zealand suggest staging the development of regulations for different types of

activities. New Zealand proposes starting with project-based activities based on existing experience and then moving to other types.

How to fulfil the overall mitigation of global emissions criterion?

While the Paris Agreement foresees that the new mechanism shall contribute to an overall mitigation of global emissions, only a few submissions discuss how to operationalise this objective. New Zealand notes that a definition of overall mitigation is so far lacking and suggests it should mean that not all the

mitigation outcomes achieved by an activity are credited to the activity.

The EU, Japan and New Zealand consider that the concept needs to be reflected in accounting rules and methodologies, with Japan and New Zealand suggesting conservative baselines. By contrast, Brazil claims that the additionality requirement ensures that emissions are tackled at a level that goes beyond what would be achieved through the delivery of the host Party's and the acquiring Party's NDCs in aggregate.

Which level of transition from the CDM?

There is a controversy on whether to prioritise discussions on transition from the CDM. In particular the AGN and Brazil see this as a matter of urgency in order not to waste the mitigation potential of existing projects and to protect the credibility of international mechanisms. The Arab Group and Brazil also call for the transposition of rules, methodologies, infrastructure and accreditation.

By contrast, the EU, Japan and New Zealand are against easy transposition of regulations and activities. The EU and New Zealand maintain that CDM activities would need to be re-assessed against the new mechanisms regulations prior to adoption into the mechanism.

Which way forward for Non-Market Approaches?

The submissions on non-market approaches do not indicate substantial conceptual advances.

The Like-Minded Developing Countries reiterate their suggestion that the framework should facilitate access to finance, technology transfer, and capacity building for mitigation and adaptation, and contributing to map and register needs of countries and assisting them in matching them with means of implementation.

Other countries reiterate their concern to avoid duplication of work with other processes under the UNFCCC. They suggest to focus discussions on possible synergies and coordination in non-market cooperation.

New Zealand suggests a novel idea for how to move forward. They propose to relocate the Technical Examination Process (TEP) and Technical Expert Meetings (TEMs) into the Article 6.8 work programme. They argue that the TEP and TEMs are established processes for considering policy approaches that fit well with the purposes of Article 6.8. In this way, Parties could cooperate on ambition, maintain an existing space where ideas and relationships are built, and expert advice is made available to all Parties.

This article builds on a recent JIKO Policy Paper by Wolfgang Obergassel and Friederike Asche: Shaping the Paris Mechanisms Part III – An Update on Submissions on Article 6 of the Paris Agreement. JIKO Policy Paper 5/2017. Download at www.carbon-mechanisms.de/en/2017/submissions-iii/



Encouraging Additional Action

Re-assessing the additionality question in connection with market mechanisms

by Thomas Forth, Advisor to the Federal German Environment Ministry

No-one would argue with the idea of encouraging additional mitigation action. What alternative could there be? Under the Kyoto Protocol, the answer seemed clear with regard to the CDM and JI. For the CDM it was providing proof that an emission reduction activity would otherwise not have taken place. To ensure that proof could be provided, the UNFCCC established a complex validation and verification process with a mighty organisational platform and a robust governance structure. The same principle was applied to JI, but with one key difference: because JI countries had all committed to setting their own emission reduction targets, it was assumed that they were also in favour of monitoring and control when it came to issuing transferable certificates. Thus, in addition to the UNFCCC process (JI 2nd track), a simplified process (JI 1st track) was introduced to be overseen by the host countries. Now that all Parties have agreed to set emission reduction targets under the Paris Agreement, it could again be assumed that those Parties have an interest in careful management of the commodity known as emissions certificates if they have submitted appropriate nationally determined contributions (NDCs).

Despite the positive experience gained with JI in Germany and France, the Kyoto Protocol's JI mechanism was subject to strong criticism. This is a risk that must be avoided in the future. Also, almost all NDCs are based on an emissions pathway that is not compatible with the long-term goal of the Paris Agreement and only in rare cases do their structures present economy-wide targets based on measures to mitigate climate. There is thus sufficient empirical

evidence to show that NDCs must be looked at more closely and that the experience gained with JI should not be repeated under the Paris Agreement. This article, therefore, focuses first on experience gained with the CDM and then addresses conditions under the Paris Agreement.

CDM under criticism despite sophisticated process

With the development of an additionality check and the CDM methodologies, the CDM set global standards for monitoring, control and transparency in reporting of emission reduction activities. And through conservative approaches in the CDM methodologies, it was also ensured that certificates were not issued for all the emission reductions that were actually achieved. This gave rise to a dual climate change mitigation effect: on the one hand, the activity can be seen as additional in its own right and on the other, restricting certificate issuance generates an additional climate benefit.

CDM project developers and investors were faced with a clearly-structured process which was overseen by the UNFCCC. Nonetheless, the CDM harboured and still harbours heightened risks that go beyond the usual business investment risks. These include complying with the existing additionality check, development and modification of the methodologies for use in calculating emission reductions achieved, monitoring of climate action activities (MRV) during a project's lifecycle and, of course, the uncertainty surrounding market prices.



Photo: Presidency Maldives / Flickr / CC BY-NC 2.0

Business as usual? President Nasheed of the Maldives installs solar panels on the roof of his home.

In using the CDM, clear improvements have been achieved with regard to the risks involved. The additionality check has been continually enhanced and dedicated rules concerning small-scale projects and positive lists for specific project types were introduced. Frequent revision of the methodologies has resulted in greater validity. There is, however, still room for improvement when it comes to process standardisation and automation. The latter also applies to MRV, which could make even greater use of results-oriented approaches and performance-based indicators. Simple, robust and transparent processes which help all stakeholders involved in the activities to produce reliability are thus of great importance. They are important not only because unnecessary transaction costs such as time and money can be

avoided, but also because they place the spotlight on Parties' willingness to engage in climate action to reduce emissions and to make usefulness the focus of the action taken.

With some 7,800 projects registered under the CDM, the emission reductions amounting to 1.8 gigatonnes already achieved and anticipated reductions of around eight gigatonnes of CO₂e make it more than clear that the CDM offered a robust, economically feasible model as long as both the demand for certificates and the price for certificates generated enough incentive. The extent to which this huge reduction in emissions achieved via the CDM can be achieved under Article 6.4 of the Paris Agreement is the most important issue in deciding the rules on CDM transition. It is thus important to see the

additionality of the CDM projects as a clear indication of why many current CDM projects are at risk financially, that many have been halted and that, for a large number of those in the CDM pipeline, the investors have withdrawn.

CDM reform within the boundaries of the Kyoto Protocol and phased withdrawal of offsetting

In addition to the criticism regarding the additionality of its activities in the early years, more recently the CDM has been less than convincing when it comes to the barriers to their implementation on the CDM market. Much of the criticism involved comes with suggestions for modification of its flexibilisation or offsetting function under the Kyoto Protocol. The offsetting incentive lies in countries being able to transfer cost-effective emission reductions from developing countries at the lowest possible certificate prices in order to meet their own reduction targets. This means that offsetting was used first and foremost to achieve reduction targets in industrialised countries. The climate change effect in the developing countries was secondary because developing countries had no reduction commitments under the Kyoto Protocol.

In addition to the criticism concerning the offsetting function, which is obviously targeted at use of the CDM by industrialised countries, the CDM also suffered a number of problematic effects which could not be solved under the Kyoto Protocol. The long and drawn out review of the CDM rules, modalities and procedures (which has been going on for years) is unlikely to bring any marked improvement. The underlying problem with the CDM of issuing certificates commensurate with national policies is obviously not something that can be discussed or solved within the framework of the CDM in its Kyoto Protocol form. The long-term definition of baselines and the exclusion of the additionality check at the end of

a crediting period are criteria which significantly impact the effectiveness of the CDM.

One obvious example involves the successful and dynamic use of renewable energy sources with the parallel freezing of the old additionality requirements. In the past, this has led to a formal justification for issuing a large quantity of certificates which flooded the market and prevented other developing countries from using the CDM. The issue of unequal regional distribution in use of the CDM is also a sign of falsely-regulated additionality verification. The regulations are not or only barely compatible with the Marrakech Accords, the set of rules reached at COP 7 on using the Kyoto mechanisms.

To enable continued use of the CDM in its present form, not only must these inadequacies be overcome, but the new provisions of the Paris Agreement must also be interpreted and met. Although the Agreement's Article 6.4 offers a range of options similar to the CDM and while it is possible to learn from past experience in using the CDM, priority must be given to the new requirements and conditions that apply under the Paris Agreement. Learning from the CDM will thus involve learning from both the positive and the negative experience gained. And when it comes to the positive experience gained in using the CDM, this will have to be rethought under the Paris Agreement. A simple one-to-one transfer of existing rules is unlikely to suffice. In the EU Submission, when referring to issues involving CDM transition, it is recommended for example that the core elements of the Paris Agreement's Article 6.4 be properly defined before matters concerning CDM transition can be discussed (cp. 'Wanted: the common denominator' elsewhere in this issue).

The issue of additionality is key in all of this. If in relation to the Kyoto Protocol, none of the countries using the CDM had their own emission reduction targets, the emission reductions achieved under the CDM must then be additional to requirements under the existing regime and to the market activities which were already taking place. In further developing additionality verification and in formalising the

additionality check, financial additionality was increasingly placed at the forefront. This meant that emission reduction activities which were financially attractive but which had failed at other hurdles were thus ineligible or at least subject to criticism.

Also, additionality at activity level was defined in relation to the host country and not in relation to the buyer country. At the macro level of global benefit, a supplementarity rule was introduced to achieve a minimum 50 percent of buyer country emission reduction targets by means of domestic climate action. Little focus has, however, been placed on the extent to which future use of Article 6 by buyer countries will be subject to specific rules – neither in the global debate nor in the climate change negotiations. As already mentioned, the offsetting debate is a domestic matter for buyer countries. Like all Parties to the Paris Agreement, buyer countries must prove how their NDCs contribute to the long-term goal of the Paris Agreement over time. Use of offsetting can thus only be seen to serve climate change mitigation in the medium term – in other words, as long as the potential offered by offsetting is needed to meet the emission reduction targets contained in NDCs.

It is hard to imagine that an effective global climate change regime could harbour any notable offsetting potential. But in the medium term, the demise of offsetting will not be linked with developments on the carbon market. The vision of a globally connected carbon market involving use of emissions trading, other national market mechanisms and carbon pricing instruments will play an ongoing role in reducing greenhouse gas emissions in the longer term. The vision of full decarbonisation, if it can be achieved at all, calls for regulation by means of the carbon market for several decades to come.

Additionality and the Paris Agreement

In the provisions of the Paris Agreement, additionality is not defined. The Paris Agreement takes a bottom-up approach, leaving it up to Parties themselves to determine their own contribution to the global climate effort via their NDCs. Cooperation via the provisions of Article 6 is designed to help countries raise their ambition in defining their NDCs. This is possible in both the current and the subsequent NDC periods. Additional requirements under Article 6 refer to the issues of robust accounting, environmental integrity and sustainable development.

Because all Parties now have emission reduction targets, in contrast to the provisions of the Kyoto Protocol, there is no longer the need to at least determine additionality in relation to business as usual and to ensure compliance with legal requirements for countries with no commitments. Thus, in principle, all countries have a general interest in only transferring certificates to another country if they cover emission reductions which are in excess of those needed to meet their own NDCs. This is why policy-related questions such as how to avoid hot air should be answered by creating a virtual budget, such as the Assigned Amount under the Kyoto Protocol. Tradable certificates and the exchange of ITMOs between Parties should be linked to actual emission reductions.

NDC-related problems which are not connected to absolute targets can only be overcome with great difficulty, for instance by means of intensity targets. NDC reduction targets which are not based on the CO₂ metric will be even more problematic when it comes to calculating them in CO₂-equivalents and should thus not be calculated, but instead inventoried in the global stocktake.

Another key problem is the single year target, which at first glance appears to be an accounting problem, but is in actual fact a challenge in terms of climate action ambition. Climate action-conscious buyer states should, of course, not only buy emission



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Common practice? The Paris Agreement puts the additionality question in a totally different context.

reductions from the target year, but also finance these measures from the start and have this counted towards their climate financing contribution. This is a much better approach than the existing mathematical-statistical considerations involving the calculation of average reductions achieved during a project's lifecycle or similar.

Focus on NDCs simplifies additionality verification

It could all be so simple, as the following story shows. A country announces its nationally determined con-

tribution to global climate action. It sets out the action it will take without third-party assistance and also the targets and activities it could implement with external support. In doing so, the country has answered the question of the additional activities that are potentially possible. Any further verification of additionality can thus be dispensed with and raised ambition secured. The only issue that remains is the availability of sufficient resources. This involves both the "means of implementation" described in the Paris Agreement and the voluntary forms of cooperation contained in its Article 6.

The long-term vision of Article 6

Use of Article 6 with all its cooperation options will help to ensure that, eventually, all Parties will develop NDCs which cover all emissions and gradually set out an emission reduction pathway that enables achievement of the long-term goal. The various reduction approaches taken in the carbon market – baseline and credit, and cap and trade – have contributed significantly to achieving this goal. The trading component of both approaches enables both cost-effective target achievement and the greatest-possible climate change mitigation effect in exploiting reduction potential. A precondition for this, therefore, is ensuring the greatest-possible tradability of certificates generated via the cooperation approaches contained in the Paris Agreement.

In addition, let us say as a ‘side effect’ of using the mechanism, there is the not-insignificant matter of quantification of emissions in the areas of application, sectors and sub-sectors of the respective Article 6 activities. Use of Article 6 can result in a large-scale, indispensable contribution to quantification of NDCs. Over time, the crediting approaches will help to raise ambition over the lifecycle of an NDC and also highlight the potential that countries are able to build into their NDCs. Quantification of the areas of use under Article 6 has also assisted development of the economy-wide targets. In their medium-term effect, baseline and credit approaches have led to a levelling out of reduction efforts across Parties. Building on this, regional and increasingly global level playing fields could arise which only allow linking of emissions trading schemes with the raised ambition required by the Paris Agreement.

In the decades to come, both the current carbon market mechanisms and those foreseen for the future will play a much greater role in the implementation of the Paris Agreement and in the associated development of a low-carbon economy. By about 2050, the remaining emissions could be auctioned – in a similar way to the current Pilot Auctioning Facility (PAF) –

and allocated as part of a price-setting process, while emissions trading would provide the regulatory basis on which to manage emission allowances which are due to expire. This would produce a hybrid system that allows a small quantity of emissions which must be allocated by means of a competitive process. As a climate policy instrument, the carbon market will remain indispensable until such time as anthropogenic greenhouse gas emissions no longer have the hugely negative impact that they have on the global climate today.

Back to reality

When it comes to additionality, the “what if” question provides a clear answer if countries develop ambitious NDCs which follow a development pathway that meets the long-term goal of the Paris Agreement and can result in full quantification of NDCs and the areas of application under Article 6. Additionality verification would no longer be needed. It is difficult to say how many rounds of NDCs would be necessary to create such clear conditions for cooperation, but it is, however, safe to say that the conditions to allow such an approach do not exist at the present time.

Looking at the reality of international cooperation on the carbon market, a vision of this kind appears absurd. On the one hand, the targets contained in countries’ NDCs do not lead to a reduction pathway that meets the long-term goal of the Paris Agreement, meaning that all cooperation activities do not contribute to “overall mitigation”. On the other, the Paris Agreement with its many cooperation forms is designed to make this goal achievable. The NDCs should thus be gradually brought in line with this development pathway and voluntary cooperation under Article 6 should help to ensure that this is achieved.

Thus, under the Paris Agreement, the weakness of NDCs is the starting point for additional activities under Article 6. There are no restrictions on the use of Article 6 provisions and especially not in relation



Changing perspectives: unlike the Kyoto Protocol, all Parties have emission reduction targets under the Paris Agreement, fundamentally changing the basis of cooperative implementation.

to Article 6.4 and Article 6.8. It must, however, be remembered, that activities beyond the scope of NDCs cannot be counted as emission reductions achieved via NDCs. But is this a reason to restrict emission reduction activities solely to the scope of weak NDCs?

Because the Paris Agreement provides no references in this regard, attention thus shifts to robust accounting and especially to “corresponding adjustments”. What counts here is that a) double counting of emission reductions and multiple-issuance of certificates are prevented and b) this area of activity is also subject to inventory in the global stocktake. The approach thus covers areas not covered in an NDC

and which are thus more or less predestined for its use. The risk of lock-in is a purely hypothetical risk which occurs when the raised ambition in climate action is not ensured and when buyer states neglect the raised ambition aspect. In addition to raised ambition in host countries’ NDCs, there is the question of the willingness on the part of potential buyer states to include the raised ambition of the seller states in their cooperation strategies.

In reality, the currently weak NDCs only work in relation to the unsatisfactory demand on the carbon market. In this situation, additionality verification cannot be dispensed with. For individual projects and for programmes of activities (PoAs), the CDM

mechanism, its processes and its governance could be transferred to Article 6 in a relatively simple way. However, where the projects themselves are concerned, there would be a wide range of issues that would need to be addressed with regard to the respective NDCs.

This involves the issue of host countries and the extent to which they use reduction potential for their own NDCs, how they can contribute to achieving a robust accounting process and how the problem of double counting can be avoided. One especially difficult problem has arisen when it comes to freezing the baseline. A completely different set of rules will be needed here. The key issue to be addressed, therefore, is how national-level regulation of the respective emission sectors can be achieved over time.

Additionality today

Modification of key components of the CDM to enable implementation of Article 6.4 is only of limited use. But if meaningful development pathways are to be proposed in achieving the Paris Agreement's long-term goal, the measures seen in the CDM era will simply not suffice. As has long been discussed (more or less since the climate change conference in Bali), crediting and trading both require a sectoral approach. This far-reaching vision of global cooperation in the carbon market comes up against inadequate development of the cooperation approaches available. Both methodologies and cooperation agreements must be elevated to the sectoral level.

Including such approaches in the NDC targets, the low emission development strategies (LEDS) and in concrete policies and measures will call for considerable coordination and consultation between cooperating states. Agreements reached at this political level must also meet the requirements of Article 6. With regard to Article 6.2, it seems this can be achieved via, largely self-managed, bilateral exchange of ITMOs between the cooperating states.

For Article 6.4, it will be difficult to envision a decision-making and monitoring body (such as the CDM Executive Board) with the authority to decide on the sectoral measures that cooperating states include in their NDCs. Other solutions will need to be found if Article 6.4 is to be developed into a useful tool that can be used for more than voluntary offsetting in the private sector or even in the public sector perhaps.

Because additionality cannot be derived from NDCs in their current form and as the possibility of verification via a supervisory body under Article 6.4 appears less than acceptable for political reasons, further debate is needed on how host countries can use Article 6.4 in their cooperation strategies. Only through such debate will it become clear how the issue of additionality is to be regulated under the Paris Agreement.

Scaling Up

Using Article 6 to support the global energy transition

by Wolfgang Obergassel, Martin Burian, Lukas Hermwille, Konrad Raeschke-Kessler

Renewable energy technologies, in particular solar and wind energy, have made remarkable advancements in recent years. However, further advances are not automatically a given. A research project commissioned by the Federal German Environment Agency analysed how Article 6 of the Paris Agreement might be used to promote the further upscaling of renewable energy use.

A core part of the project was to develop mechanism designs which could be applied to implement bilateral or multilateral cooperation on the support of renewable energy projects using internationally transferred mitigation outcomes (ITMOs). The development of mechanism designs was inspired by long-standing discussions about sectoral approaches and by ideas for using established national renewable energy (RE) support schemes for international cooperation.

Sectoral Crediting for the Power Sector

For more than a decade, there has been a discussion on introducing sectoral crediting under the CDM. In essence, the concept envisages to issue credits for the performance of an entire sector rather than for individual projects. The following provides a design example for how sectoral crediting could be structured for the power sector under Article 6; the figure below illustrates the example:

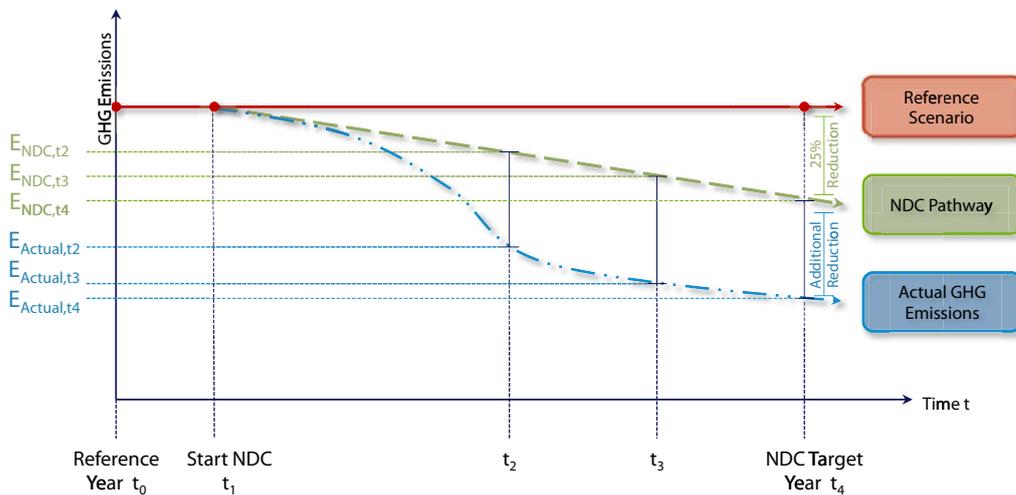
- The sectoral reference scenario may be established by the specific emissions of electricity generation, the so-called Grid Emission Factor (GEF), combined with the total electricity generation per year. The GEF may be determined using the CDM's 'Tool to Calculate the Emission Factor of an Electricity System'.

- Considering the total annual electricity generation would not only provide incentives for increasing the shares of renewables, but such a baseline setting principle would also strongly incentivize increasing energy efficiency of electrical devices, e.g. through establishing demanding Minimum Energy Performance Standards (MEPS) for air conditioning systems and other major electricity consuming devices.
- The reference scenario (see red line in the figure below) would have to be set for the reference year (i.e. year to in the figure below).
- In a second step, following the provisions of Art. 6.2, it is essential to consider the target setting of the NDC. The NDC may, for example, aim at reducing the GHG emissions of the electricity sector by 25% up to a NDC target year (e.g. 2030). This allows for quantifying the trajectory of the NDC pathway compared (green line) to the reference scenario over time.
- If the performance of the actual GHG emission pathway (blue line) exceeds the NDC objectives (for a specific year), then the country would be entitled to transfer ITMOs.

A challenge in this approach lies in fact that the NDCs would need to be broken down to the specific sectors as a basis for crediting. For example, being a sub-sector of the energy sector, the electricity sector is not necessarily directly regulated by the NDC / the NDC does not stipulate a specific reference scenario for the sub-sector.

Moreover, unlike CDM/JI, sectoral crediting would not provide direct incentives to private entities and project developers, but solely to governments. Governments may decide on whether they want to facilitate the transition to renewable energy through policy changes (e.g. guaranteed access, grid code

Figure 1: Sectoral Crediting



revisions, tax exemptions, etc.), financial incentives (e.g. Feed in Tariffs, Feed in Premium, guarantees) or a combination of both. Some such policies could be supported by cooperating countries, as will be discussed in the following sections.

Trade in Renewable Energy Credits (RECs) and Linking of Systems of Renewable Energy Quotas

Many countries have opted to incentivize renewable energy development by imposing renewable energy quotas or renewable energy portfolio standards. In these schemes, designated entities (e.g. utilities) are required to supply a (gradually increasing) amount of electricity from renewable energy sources. Typically, this is implemented by introducing a form of renewable energy certificate (REC): a REC is issued for every MWh electricity produced to the owners/operators of the renewable energy production unit. RECs are tradable. Utilities (or other designated entities) may purchase RECs to demonstrate compliance with their quota/portfolio standard obligation.

International cooperation could occur when two (or more) countries decide to link their respective REC markets and allow for cross-border trade of RECs. If such a link of markets is

implemented under the Paris Agreement's Art. 6.2, the RECs transferred would represent ITMOs. There are different options for such transfers to take place:

- One option is direct government transfers: the investor country buys certificates on the host countries' green certificates market, thereby increasing demand for renewable energy capacities.
- Option two is bilateral linking: if both cooperating countries have green certificates markets, the systems could be linked on the basis of a bilateral agreement.
- A third option is one-way linking: in this scenario, only companies from the investor country's scheme are allowed to buy green certificates from companies in the host country.

In order to account the amount of RECs transferred against the countries' NDCs, one would have to determine the net flow of RECs between the cooperating Parties. The next step would depend on the types of the cooperating countries' NDCs. Accounting such transfers against a renewable energy target could be relatively straightforward while accounting against emission targets would require to determine the actual emission reductions implicit in the traded RECs. Applying a grid emission factor (GEF) is a standard approach for this

task, but the GEF would arguably need to be adjusted for the host country's NDC.

International Co-Financing of Renewable Energy Capacity Auctions

Many countries have introduced auctions to procure renewable energy. Project developers are invited to place bids indicating the capacity to be installed and projected annual electricity generation as well as the required price per MWh generated. Contracts are awarded to those projects that feature the lowest price requirements. The volume of an auction can be determined *ex ante* in terms of installed capacity or in terms of the financial budget.

International cooperation can occur if one country supports the renewable energy auctions of another country by agreeing to finance an additional fixed amount of renewable energy capacity or by topping up the auction budget. In the former case, the determination of the emission reductions is relatively straight forward: it is the product of RE produced [in MWh] and the grid emission factor. In the latter case, the calculation is more complex. The countries could agree to split the incentivised emission reductions in line with the respective contributions to the overall auction budget. Another solution would be to identify those bids that could only be financed due to the increased budget. As the bids are ranked from low to high, in this case the investing country would finance only the most expensive renewable energy projects and hence a relatively smaller share of the emission reductions would be transferred internationally.

International Co-financing of a Feed-in Tariff

With feed-in tariffs (FIT), for each kWh of renewable energy fed into the grid, either a guaranteed fixed remuneration (fixed payment FIT) or a price premium on whole-sale prices (premium payment FIT) is disbursed. International cooperation could occur if country A agrees to contribute a share of the premium/fixed payment per kWh renewable energy produced in country B.

However, attributing the emission reductions to either country is not straight forward, particularly if one assumes a concave supply curve for renewable energy (increasing marginal cost). In this case, in-creasing the feed-in tariff would not yield a proportionate increase of renewable energy supply. Moreover, those capacities that are incentivized by an increased tariff may produce less electricity than the cheaper capacities. In fact, the very reason for being more expensive may be having a lower production rate because of, for example, being installed in locations with lower average wind speeds or lower solar radiation. Attributing emission reductions to either country is further aggravated by the fact that supply curves typically cannot be determined precisely but can only be estimated at best.

Given these restrictions, it may be impossible to determine a partitioning of emission reductions objectively. In order to determine the actual benefit sharing and corresponding adjustments, the countries involved may therefore have to negotiate a contractual share-out of the emission reductions realized based on estimates and approximations.

Blending Instruments Through International Financial Institutions

Incremental costs compared to fossil fuel technologies are not the only barrier preventing a stronger uptake of renewables. As a consequence, instruments that provide additional revenue may not necessarily be what is most needed in a specific local context. In some countries, risk-sharing instruments such as guarantees or insurance could allow to foster renewable energy investments without very substantial public funding engagement. International financial institutions (IFIs) could play a role in providing such instruments. The following text box sketches a concept for how a financial institution such as the GCF (or any other IFI) could blend use of Article 6 and other financial instruments.

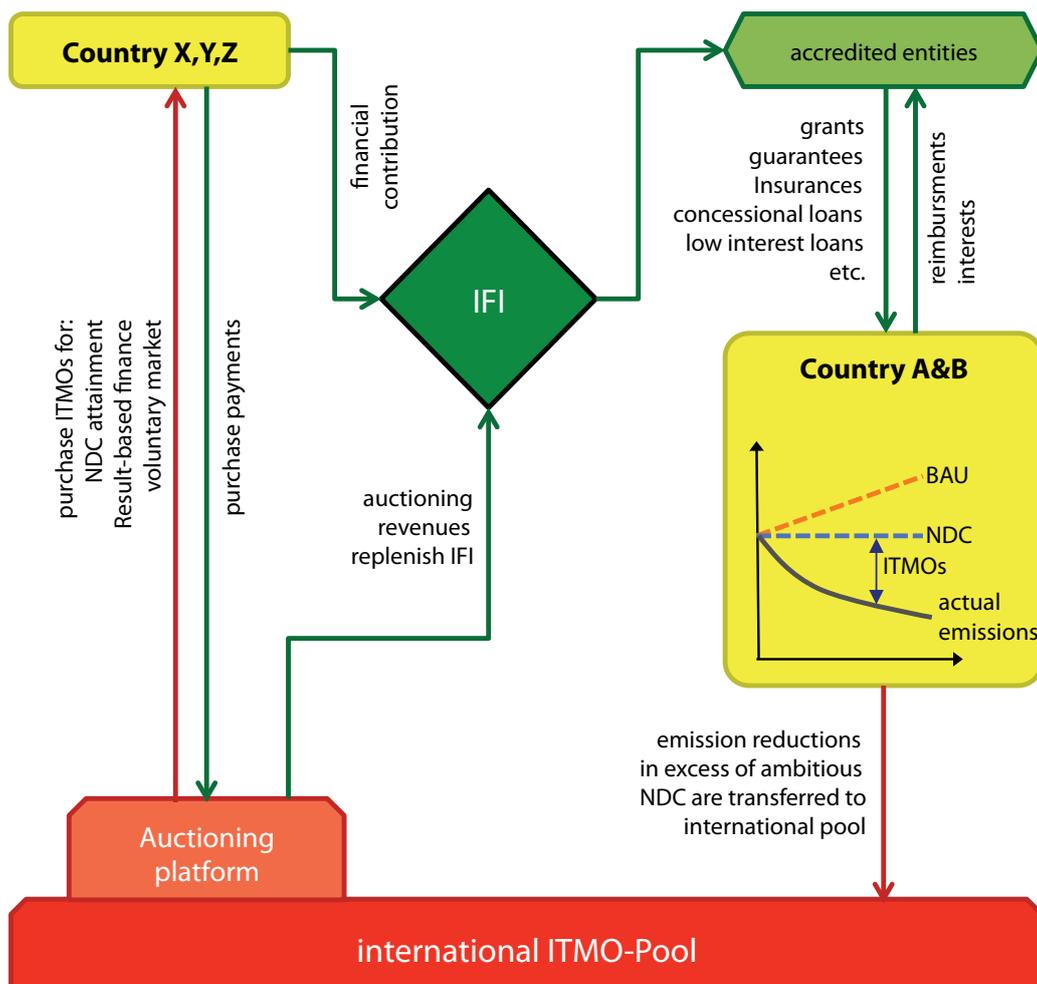
Potential advantages of such an approach include:

- RE activities may receive upfront funding;
- Additionality testing might be replaced by (a) the IFI's funding criteria and (b) a verification of the credit worthiness/bankability of the project. If such funding criteria robustly guarantee the effectiveness, i.e. the additional mitigation effects of the applied instruments, the additionality criteria would also be fulfilled.

Sketch of a Possible Article 6 Mechanism with IFI involvement

The below figure depicts a potential set-up, where the sequence of steps would work as follows:

- Donor countries (X,Y,Z) provide financial resources to the International finance institution (IFI).
- The IFI uses these resources to finance use of instruments such as grants, concessional loans, insurance or guarantees for RE deployment in host countries (A & B) of the mechanism.
- Countries A & B host RE projects that benefit from IFI support.
- Emission reductions in excess of ambitious host country NDC are determined using a sectoral crediting approach (see above).
- ITMOs are directly transferred to an international pool.
- The ITMOs are auctioned, potential buyers include countries (X,Y,Z) aiming to use ITMOs for their NDC attainment and/or results-based finance, but could also include buyers in the voluntary market.
- The auctioning revenues serve to replenish the IFI.



- As ITMOs would not be issued to host countries, there would be less perverse incentives to keep NDCs weak;
- The system would to some extent refinance itself, though whether revenues from the sale of ITMOs would recoup all upfront expenditure would depend on the relation of the carbon price to mitigation costs. At high carbon prices, the fund's volume might even grow (for example, if mitigation costs of funded activities are on average 10 US\$ per tCO₂e while the ITMOs sold fetch a price of 20 US\$). By contrast, at low carbon prices, the revenue would likely not be able to recoup all expenditures and there would need to be replenishment from donors.
- Using Article 6 would ensure the raising of ambition indicated by Article 6.1 for all Article 6 mechanisms. In particular, if Article 6.4 is used, the built-in measures to ensure an overall mitigation of global emissions could implement this ambition raising aspect in a transparent manner.

One risk of such an approach is that the initial funding might subsidise mitigation for the final buyers of ITMOs and thereby distort the carbon market. This risk applies in the low-price scenario, where carbon prices are lower than the mitigation costs of the activities funded by the IFI. If mitigation costs were 10 US\$ per tCO₂e but ITMO buyers needed to pay only 5 US\$, the initial seed funding would effectively subsidise the buyers' NDC achievement. By contrast, if the carbon price was higher than the mitigation costs, the ITMO buyers would subsidise the revolving fund.

Given the limited indications of demand in current NDCs, the low-price scenario seems more likely. The system should therefore include a minimum auction price at a level to at least recoup the mitigation costs funded by the IFI. If there are no buyers at this price, the ITMOs should be parked and eventually cancelled if low demand persists. In this scenario, donors would need to continually replenish the fund and the system would effectively become a vehicle for results-based public climate finance using the MRV system of Article 6.

Outlook

While use of RE is becoming increasingly cost-effective, investments are still confronted with barriers of various types, which range from lack of technological know-how to lacking political and legal framework conditions.

A strong enabling framework has the potential to spur renewable energy technology employment through leveraging substantial private capital investments. The creation of a favorable enabling environment may be supported through traditional technical assistance programs under the framework for non-market approaches. Such assistance could comprise support for renewable energy policy design, institutional capacity building, resource assessments, grid connection and management, and skills development for local manufacturing and maintenance. Such enabling activities could be combined with direct financial incentives structured under Art. 6.2 and/or Art. 6.4

Under the CDM, effectiveness of the incentives provided has been limited by the associated transaction costs, issuance risks and price risks. Moreover, the technology-neutral approach has resulted in incentives being inefficiently high for some project types and too low for others, including for CO₂-avoiding renewable electricity generation projects.

Opening Art. 6 for national-level design options could help overcoming these limitations by harnessing national policies for climate change mitigation. Art. 6 could be used to support policy instruments that have already proven to be highly effective in mobilizing private investment for renewable energy, such as feed-in tariffs, auctions, and quota systems. Establishing cooperation at the level of policies would allow the level of financial support to be tailored to the specific support needs to the specific measure that is to be promoted, instead of establishing a globally uniform price level which inevitably is too high for some measures and countries, and too low for others.

For countries that do not yet have the capacity to implement such policies, programmatic approaches as developed under the CDM could be used.

Such a policy-based approach would mark a step change from the traditional project-based offsetting approaches exemplified by the Kyoto mechanisms. It would require investor and host countries that are willing and able to engage with each other at a political level. This role would be very different from their core role in the CDM, i.e. issuing letters of approval for projects driven by private entities.

Distributed Ledger Technology

The blockchain and the use of carbon markets under the Paris Agreement

by Marion Verles, The Gold Standard Foundation | Sven Braden, LIFE climate foundation | Jürg Füssler, INFRAS

The blockchain technology allows for a new kind of cryptographically secure decentralized database systems. The concept was first described in a white paper in 2008 under the pseudonym 'Satoshi Nakamoto'. Nakamoto proposed an innovative peer-to-peer electronic currency called Bitcoin, which would enable online payments to be transferred directly, without an intermediary. Although the Bitcoin currency is an interesting and innovative experiment, it was the trust-building Blockchain technology behind it, which soon began to be seen as the actual revolutionary aspect.

A blockchain is a decentralized database that is secured and maintained by a large number of computers worldwide. Data is stored in time-stamped blocks, which are linked to each other in a secure way to form a chain. This chain of blocks ensures that all data is stored in the chain and cannot be altered without breaking the chain. These features result in a secure and immutable decentralized data system. Even more importantly, it allows for the use of so-called smart contracts. A smart contract is nothing but a program which defines and executes agreements between multiple parties. Such code is able to define a series of relations, parameters and actions. For instance, a blockchain based smart contract may automatically issue a mitigation unit as soon as a turbine of a hydro power plant has generated a certain amount of renewable power (in kWh).

These features can be very helpful when implementing activities under Art. 6 of the Paris Agreement. This overview highlights three of the key challenges in implementing Art. 6 of the Paris Agreement and

outlines how blockchain technology may help overcome these.

Overcoming implementation challenges of Article 6

The decentralised, bottom-up nature of the Paris Agreement requires new approaches to ensure its implementation delivers on environmental integrity, transparency and ambition raising.

Challenge 1 – ensuring robust accounting and avoiding double counting

Ensuring robust accounting and avoiding the double counting of mitigation outcomes is critical to create trust in market mechanisms and incentivise low carbon investments at scale. This requires to ensure that mitigation outcomes are issued, accounted and claimed only once.

In the context of Art. 6.2, for example, this requires that each mitigation outcome may either be accounted towards meeting the host Party NDC or towards the NDC of the Party, but not both. A blockchain registry jointly-run by Parties pursuing a voluntary cooperation under Art. 6.2 would ensure that every outcome generated, issued and internationally transferred is coded into the network and reconciled with national registries. Such a network would be run by nodes (computers) associated to the Parties that cooperate accordingly. The same universal log of all transac-

tions would be stored on every participating Party node.

Such system would increase transparency and data security. Participating Parties would need to agree on a common set of basic information to be stored in such network (e.g. geographical indicator/time/amount/mitigation action inside or outside host country NDC). In addition, information related to unit quality, sustainable development or how the mitigation action will contribute to increasing ambition may be included in the blockchain or separately if desired. In a decentralized system, the blockchain technology may provide a better level of trust and security than conventional registry and tracking systems.

Challenge 2 – complex and diverse MRV requirements across jurisdictions

Lessons from the CDM have shown that carrying out MRV at a project level in a robust and credible way is complex, costly and can lead to significant transaction costs. The nature of these requirements can be off-putting for investors who may perceive these as additional risk factors.

In addition, the recent years have seen a significant growth in carbon pricing schemes worldwide with 40 national and 25 subnational jurisdictions operating some form of carbon tax, domestic crediting, emission trading or other carbon pricing scheme. MRV requirements across these jurisdictions differ greatly leading to diverse and sometimes inconsistent sets of requirements. The definition of a mitigation outcome may therefore be different from one jurisdiction to another or also between different schemes within one jurisdiction. In this context, it is difficult to imagine how the trading of mitigation outcomes across jurisdictions can be possible.

Blockchain technology may help overcome these challenges associated with complex and diverse MRV requirements in several ways. First, a blockchain network can use smart contracts to translate various



Photo: GollyGforce / Flickr / CC BY 2.0

Strong links: blockchain technology offers smart solutions. Also for implementation under Article 6?

country specific mitigation outcomes into a single, commonly agreed 'mitigation unit' that would be tradeable across jurisdictions that agree on this unit. Second, various steps of the MRV process such as data collection, emission reduction calculation or verification can to a certain extent be automated and carried out by the blockchain network using again smart contracts. Renewable energy projects, for instance, seem well positioned to take advantage of blockchain networks for emission reduction calculation and verification purposes, as these project MRV



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Reducing MRV complexity: especially renewable energy projects could benefit from blockchain networks.

requirements rely on relatively easily accessible data (emission factors, production data).

Coupling the benefits of a decentralized database with smart contract applications and the Internet-of-Things (e.g. direct information from gas or power meters) may help reduce risk and complexity associated with emerging Art.6.4 MRV requirements.

Challenge 3 – ensuring traceability of financial flows

The traceability of financial flows can be compromised by the multitude of Parties involved in the process of delivering mitigation outcomes. It can be difficult to link the disbursement of funds with the delivery of climate benefits. Under Art. 6.2, for example, an acquiring Party may be willing to unlock payments as mitigation outcomes accrue and are transferred over time. Reciprocally, the private sector

implementation partner on the ground in the transferring country may seek to mitigate the risk that payments e.g. through the local national authority do not materialise even though climate outcomes would accrue as planned. In this specific example, the lack of a trusted third party may hinder the deployment of financial flows.

A central benefit of blockchain networks is that they may to a certain extent replace the need for a trusted third party, if the involved Parties can agree on specific rules to be embedded in smart contracts. In our example, the acquiring country might transfer its financial contribution into digital assets locked into a smart contract. The rules underpinning the smart contract would either be defined according to decisions of the CMA and the relevant supervising body in the case of Art. 6.4 or according to CMA guidance and decisions of the cooperating Parties in the case of Art.6.2.

In both cases, the requirements to unlock payments would be coded in the smart contract and stored on the blockchain following pre-agreed rules. For illustration purposes, the smart-contract could automate payments to the implementation partner every time a certain volume of mitigation outcomes is recorded on the blockchain and transferred to the acquiring Party. The smart contract would require that mitigation outcomes are verified by an independent third party before the payment is made. It could also require specific additional information such as the geo-localisation, time period and mitigation sector with regards to NDC of the mitigation outcomes.

market instruments, but also for the mapping of inventories and NDCs, supporting transparency in reporting and review of mitigation and adaptation action etc. The Climate Ledger Initiative seeks to provide a platform for research on the potential of blockchain technology in all aspects of the Paris Agreement and for use cases to gain experience on its practical challenges and opportunities.

The authors are members of the Climate Ledger Initiative Coordination Committee. More information is available at <https://climateledger.org/>

Outlook: blockchain technology for climate action

The emerging blockchain technology is currently still in its infancy and will need considerable research and piloting efforts to mature. Nevertheless, it is increasingly picked up in many sectors including in finance and insurance, energy generation and distribution. Countries and institutions such as the World Bank and UN organisations are including blockchain into their strategies and start gaining experience in pilot applications e.g. for blockchain based e-governance, humanitarian aid, energy access, and the promotion of sustainable supply chains.

It is important to note that the concept of blockchain (or the more general approach of distributed ledger technologies) goes far beyond the better known cryptocurrency Bitcoin. Also, blockchain technology will not be the silver bullet to solve the many issues that are currently pending in Art. 6 and negotiations and in the implementation of the Paris Agreement in general.

However, its distributed and cryptographically secure nature as well as the possibility to embed rules in smart contracts indicate a significant potential for the blockchain technology to foster the implementation of the Paris Agreement. This holds not only for

CARBON MECHANISMS REVIEW



Neutrality Goals and the Role of Offsetting: New Paper

A new JIKO Policy Brief portrays the commitments of selected countries, jurisdictions, and corporations and analyzes the role of offsetting. Download at

<http://tinyurl.com/carb-neutral>

Private actors in Art. 6 activities: side event on Nov 14

The Wuppertal Institute is going to conduct a side event "Private actors in Art. 6" on behalf of BMUB on Nov 14, 11.30-13 hrs, at Bundespresseamt, Bonn. Please register via email:

jiko@wupperinst.org

Glossary

All Carbon Market terms and abbreviations are explained in detail in the glossary on the JIKO website. You can view the glossary here:

www.carbon-mechanisms.de/en/service/glossary/